2023 SUBMISSION

ANNUAL TARIFF ADJUSTMENT

The Jamaica Public Service Company Limited

May 5, 2023

Glossary

ABNF	-	Adjusted Base-rate Non-Fuel
ADMS	-	Advanced Distribution Network System
ADO	-	Automotive Diesel Oil
ART	-	Annual Revenue Target
CAIDI	-	Customer Average Interruption Duration Index
CIS	-	Customer Information System
CCMA	-	Complex Connection Management Application
CPLTD	-	Current Portion of Long Term Debt
CPI	-	Consumer Price Index
CT	-	Current Transformer
DER	-	Distributed Energy Resources
DMS	-	Distribution Network System
DPCI	-	Annual rate of change in non-fuel electricity revenues as defined in Exhibit 1 of the Licence
dI	-	The Annual Growth rate in an inflation and devaluation measure
EAM	-	Enterprise Asset Management
EEIF	-	Electricity Efficiency Improvement Fund
EGS	-	Electricity Guaranteed Standard
ELS	-	Energy Loss Spectrum
EOS	-	Electricity Overall Standard
FCAM	-	Fuel Cost Adjustment Mechanism

FCI	-	Fault Circuit Indicator
GCT	-	General Consumption Tax
GDP	-	Gross Domestic Product
GNTL	-	Non-technical losses that are not totally within the control of JPS – designated by JPS as general non-technical losses
GOJ	-	Government of Jamaica
GIS	-	Geographic Information System
GWh	-	Gigawatt-hours
HFO	-	Heavy Fuel Oil
ICCP	-	Inter-Control Center Communications Protocol
ICDP	-	Integrated Community Development Programme
IPP	-	Independent Power Producer
IEEE	-	Institute of Electrical and Electronics Engineers
JEP	-	Jamaica Energy Partners Limited
JMD	-	Jamaican Dollar
JNTL	-	Non-Technical Losses that are within JPS' control
JPS/Licensee	-	Jamaica Public Service Company Limited
KVA	-	Kilovolt-Ampere
kWh	-	Kilowatt-hours
Licence	-	The Electricity Licence, 2016
MAIFI	-	Momentary Average Interruption Frequency Index
MED	-	Major Event Day/s
MDMS	-	Meter Data Management System

MSET	-	Ministry of Science Energy and Technology
MVA	-	Mega Volt Amperes
MW	-	Megawatt
MWh	-	Megawatt-hours
NBV	-	Net Book Value
NELRP	-	National Energy Loss Reduction Program
NFE	-	New Fortress Energy
NTL	-	Non-technical losses
NWC	-	National Water Commission
O&M	-	Operating and Maintenance
OCC	-	Opportunity Cost of Capital
Office/OUR	-	Office of Utilities Regulation
Old Licence	-	The Amended and Restated All-Island Electric Licence, 2011
OUR Act	-	The Office of Utilities Regulation Act
OMS	-	Outage Management System
PATH	-	Programme of Advancement Through Health and Education
PAYG	-	Pay As You Go
PBRM	-	Performance Based Rate-Making Mechanism
PCI	-	Non-fuel Electricity Pricing Index
PIOJ	-	Planning Institute of Jamaica
PLEXOS	-	PLEXOS is a simulation software that uses cutting-edge data handling, mathematical programming, and stochastic optimization techniques to provide a robust analytical framework for power market analysis

PPA	-	Power Purchase Agreement
RAMI	-	Residential Advanced Metering Infrastructure
RE	-	Renewable Energy
Revenue Cap	-	The revenue requirement approved in the last Rate Review Process as adjusted for the rate of change in non-fuel electricity revenues (dPCI) at each Annual Adjustment date as set out in Exhibit 1 of Schedule 3 of the Licence.
REP	-	Rural Electrification Programme Limited
ROE	-	Return on Equity
ROI	-	Return on Investment
ROR	-	Return of Return
RPD	-	Revenue Protection Department
SAIDI	-	System Average Interruption Duration Index
SAIFI	-	System Average Interruption Frequency Index
SBF	-	System Benefit Fund
SCADA	-	Supervisory Control and Data Acquisition
SJPC	-	South Jamaica Power Company
T&D	-	Transmission & Distribution
TFP	-	Total Factor Productivity
TL	-	Technical Losses
TOU	-	Time of Use
USD	-	United States Dollar

VSP	-	Voltage Standardization Program
WACC	-	Weighted Average Cost of Capital
WKPP	-	West Kingston Power Plant
WT	-	Wholesale Tariff

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Executive Summary

Introduction

The current filing is a submission by Jamaica Public Service Company Limited (JPS) under the Electricity Licence, 2016 ("Licence"). It provides an overview of the Company's 2022 Annual Adjustment in accordance with Schedule 3, Paragraph 43, which states:

> *"The Licensee shall make annual filings to the Office at least sixty (60) days prior to the Adjustment Date. These filings shall include the support for the performance indices, the inflation and the proposed Non-Fuel Base Rates for electricity, and other information as may be necessary to support such filings…."*

This filing is JPS' third annual rate application under the Performance Based Rate-making Mechanism ("PBRM") following the conclusion of the 2019-2024 Rate Review Process approving JPS' five-year Revenue Requirement, revenue caps, capital plan, demand projections and performance targets on a forward-looking basis. In addition to being the third Rate Review, it represents another year of the Company operating in a climate where its operations have been negatively impacted.

JPS recorded a total of 3,065 GWh in electricity billed sales during the year. This represented an increase of approximately 3% relative to the prior year. This improvement was driven by the robust growth experienced across the commercial and industrial customer segments as economic activity returned to normalcy in Key Service and Goods-producing industries.

Energy sales performance relative to the Office of Utilities Regulation (OUR) approved 2022 target was similar with only 0.2% negative variance or approximately 7 GWh less on aggregate. The variance was driven by weaker sales relative to target for residential and large industrial customers. Sales performance for RT70 customers was better than expected by approximately 9.5% (28 GWh).

As general economic output returns to typical levels post COVID pandemic, electricity demand is anticipated to continue its recovery in keeping with growth trends for the macro economy and typical usage patterns - specifically for key sectors such as Tourism & related services as well as Manufacturing. As such, electricity overall demand is projected to return to normal levels seen before the onset of the pandemic.

The Planning Institute of Jamaica (PIOJ) has estimated a growth in the overall economy within the range of 1% - 3% for the fiscal year 2023/24. This is also in keeping with the International Monetary Fund's (IMF) expected growth of 2% for 2023. This reflects the normalization of economic output post the COVID pandemic and a return to the long-term growth trend.

Business Performance

Consistent with the utility industry, JPS is going through a digital transformation in order to transform the way energy is delivered. Thereby, enhancing operational performance and improving the customer experience. In the Jamaican energy landscape, ensuring a consistent supply of electricity is critical to ensuring the continuity of residential, commercial and industrial activities to enhance national growth and development. To achieve its strategic goals, JPS requires continuous and sustainable investments in the transmission and distribution (T&D) infrastructure to deliver greater efficiency and service to its valued customers.

JPS is committed to enhancing its services to valued customers through various measures. These include investing in the T&D network, improving analytics capabilities, and enhancing customer communication. Additionally, JPS aims to provide more options and control to customers, and for this purpose, the Company is focusing on developing its digital platform. The ultimate objective of these efforts is to enhance operational efficiency and improve the quality of service, while also making it easier for customers to conduct business with JPS. With continued investments geared toward improved reliability and safety, the Company has sought to reduce technical losses and improve its communication systems to deliver real time technological contact services to its over 690,000 customers.

For 2022, JPS spent US$85.1M on the projects approved by the OUR; US$52.9M was spent on Major and Extra Ordinary Maintenance Projects, and US$32.2M was spent on Minor Projects.
To this end, in 2022, JPS spent 96% of the US$88.7M approved by the OUR in capital investments.

The table below outlines the Capital Investment projects by functions:

Function	2022 Actuals US$'000	2022 Budget US$'000
T&D	39,078	39,078
Generation	24,153	24,153
Losses	16,168	16,168
Digital	3,809	3,809
General Property	1,913	1,913
Grand Total	**85,121**	**88,699**

The 2022 envelop of investment projects consisted of fifty-one (51) projects comprising of eleven (11) Major projects and forty (40) Minor Projects. Improved reliability performance was realized from the successful completion of nine major projects primarily aimed at grid modernization, expanding, upgrade and replacement of defective assets on the T&D network to ensure compliance with the grid codes while staying true to the service area concept. These investments will enable JPS to achieve its strategic objectives of reliability, exceptional customer service and growth thus improving customer experience.

Major Projects completed were:

- Smart Meter Program
- Residential Automated Metering Infrastructure (RAMI) Program
- Grid Modernization Program
- Critical Spares – Generation
- Distribution Line Structural Integrity
- Customer Growth (CCMA)
- Combine Cycle Plant
- Smart LED Streetlight Program
- Meters & Service Wires

The fallout from the global pandemic and the war in Ukraine continue to have a hostile impact on JPS operating environment, resulting in some project execution delays. It is one of the main drivers for deviations from the plan. For example, the 2022 Voltage Standardization Program (VSP) experienced significant difficulties in procuring key inputs such as conductors, insulators, poles, and transformers. The delivery of smart meters and Grid Modernization devices was also delayed during the year, which lead to the need for significant ramp up of installation activities in the final quarter of 2022. The most significant impact is that the VSP scope for 2022 had to be differed to 2023.

JPS will continue its efforts to improve its performance and provide safe, reliable and affordable electrical power to its customers. JPS anticipates that the projects approved in the 2019-2024 Rate Review Determination for 2023 implementation and the projects and scope deferred from 2022 will be executed at the end of 2023. In short, the intention is for approved expenditure for 2022 and 2023 to be expensed, and the planned project activities completed. This assumes global supply chains return to normal.

Performance Factors and Proposed Targets for 2023

Paragraph 37 of Schedule 3 of the Licence stipulates that losses, heat rate and quality of service targets should be "reasonable and achievable". This provision dictates that the targets must not only be capable of accomplishment by JPS, but must also be fair and appropriate based on all relevant circumstances. As mandated by the said paragraph 37, these circumstances are "*the Base Year, historical performance and the agreed resources included in the five (5) Year Business Plan, corrected for extraordinary events*".

The setting of targets by the OUR pursuant to the tenets of the Licence are to ensure the efficient delivery of high quality service to customers while safeguarding the utility's ability to generate sufficient revenue to permit future reinvestment in the system, and provide a fair return to the shareholder. In so doing, the OUR ensures JPS bears a measure of financial responsibility if it fails

to achieve the performance factors approved by the OUR. Factor performance for 2022 is summarized below.

Quality of Service (Q-Factor) is a regulatory performance factor that attracts penalties and incentives that can impact JPS' revenue. The 2023 Annual Review is the second year for the application of the Q-Factor mechanism in 2019-2024 Review period, since it was set to zero for the 2020 Annual Review. The OUR evaluates the reliability performance of JPS' system based on three (3) quality indices, System Average Interruption Frequency Index (SAIFI), System Average Interruption Duration Index (SAIDI) and Customer Average Interruption Duration Index (CAIDI) - indicating the average frequency and duration of interruptions and the average time to restore service to customers, respectively.

JPS has made significant improvements to its outage management capabilities through the introduction of the OSI OMS. The system was implemented in March 2022. However, the Company has faced challenges with data validation and quality assurance that have impacted the reliability indices. As a result, JPS is proposing that the Q-Factor outcome for the 2023 Tariff Adjustment Filing be set to zero (0) quality points due to these challenges.

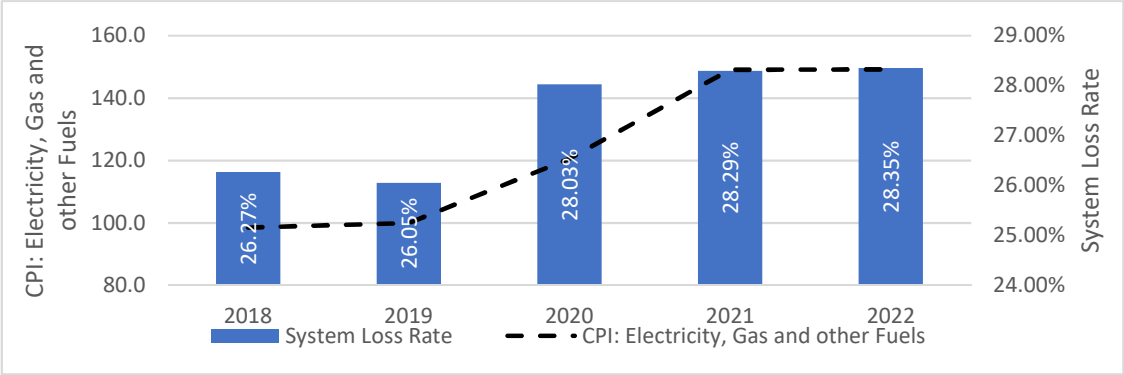
Emerging from the new OSI OMS is a significant amount of non-reportable events. This again is due to erroneous outage data, which misrepresents the actual outages, caused by the various integrating systems. Though JPS has implemented various measures to reduce the extent of these Non-Reportable events, a large percentage of these events were recorded prior to the Non-Reportable classification in the new OMS in December 2022.

The 5% cap on the Non-Reportable outages was introduced by the OUR in the **2020 Annual Adjustment Review.** Subsequently, JPS had been taking a number of steps to minimize the extent of these events in the old Ventyx OMS and currently in the new OSI OMS. While we were able to resolve a number of these non-reportable outages through the enhanced features of the new OMS, other issues could not be resolved during the period under review and will be resolved over time.

As outlined in the foregoing, JPS, as with many electric utility industries across the globe, has been facing logistics challenges stemming from the impact of the COVID pandemic. These challenges include tightening supply chains, unusually long lead times for critical assets, and shipping logistics delays, all of which have curtailed planned work activities.

System Losses (Y-Factor): System losses was relatively flat in 2022 at 28.35% compared to 28.29% in 2021. For the Losses period 2018-2022, the overall trend seems to indicate that system losses is levelling off, as shown in the table below.

System Loss Rates and CPI for Electricity, Gas, and other Fuels for the Calendar Years 2018 – 2022



The stabilisation in system losses coincides with the recovery of the economy from the exogenous shocks of the pandemic.

JPS continues to make strides in the reduction of technical losses with major initiatives taking place on both the transmission and distribution networks. These include the continued execution of the Voltage Standardization Program (VSP), the new 10 MW Caribbean Broilers (CB) Hill Run Distributed Generation Project and the Corporate Area Capacitor Bank Project.

For the Residential Automated Metering Infrastructure (RAMI) Program, six project areas were completed resulting in an addition of 1,352 new customers at the end of 2022 with an expectation of a further 1,550 by mid-2023. The loss reduction benefits resulted in 11.2 GWh annual reduction in non-technical losses. The planned benefits from the initiative were not fully realised on account of delays in the start of the projects due to longer than expected lead times on pole line materials and, to a lesser extent, unavailability of RAMI meters.

Thermal Efficiency (H-Factor)

The JPS thermal heat rate for 2022 was 9,767 kJ/kWh. When compared to 2021, this performance represents a 325kJ/kWh or 3% deterioration. This deterioration was mainly caused by: reliability challenges on both Rockfort Units, high utilization of Bogue GTs 11, 12, and 13 in simple cycle mode to maintain reliable supply and system security during the ST14 major overhaul, and significant IPP reliability challenges which increased the simple cycle operation of gas turbines across the fleet.

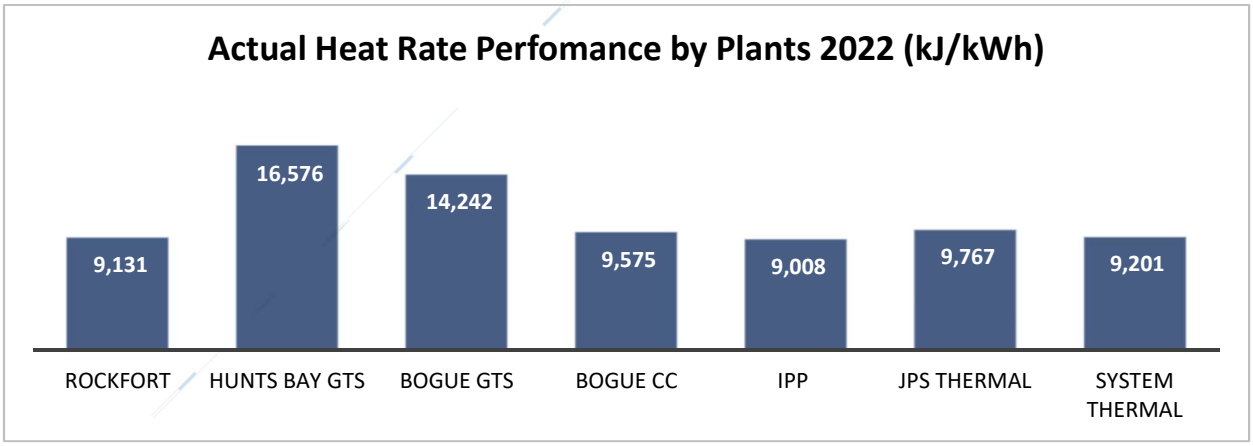
The monthly heat rate performance ranged from a high of 11,943kJ/kWh in November 2022 to a low of 9,086kJ/kWh in February 2023. The OUR's target was changed from 9,667kJ/kWh to 9,495kJ/kWh in September 2022.

JPS successfully met its targets during all periods, except for June, October, November and December 2022, despite JPS' judicious operation of the units. The reason for this success was mainly attributed to the continued implementation of JPS' prudent operational and maintenance strategies.

The system produced its second-highest net generation on record in 2022. The year's net generation was 3% higher than 2021 (4,425 GWh vs. 4,304 GWh), and 1% higher than the expected load demand of 4,387 GWh. This is a positive signal that the load demand is on the verge of fully recovering from the effects of the COVID pandemic.

Reliability challenges experienced by IPPs continued to deteriorate JPS's thermal heat rate performance in 2022, primarily through the resulting increased dispatch of simple cycle gas turbines. In the current landscape, IPPs account for more than 65% of the generating capacity on the grid. In the event that IPPs experience significant availability issues and forced outages, JPS frequently has to utilize its least efficient units (simple cycle peaking gas turbines) to stabilize the grid and reduce incidents of load shedding, in keeping with its Licence obligations to maintain a reliable supply of electricity to its customers.

These challenges and the resulting increase in gas turbine dispatch was very evident in 2022, mostly due to the major forced outages experienced at the New Fortress Energy (NFE) Combined Heat and Power (CHP) plant, lasting more than six (6) months in total.



2023 Annual Tariff Adjustment

The 2023 Annual Revenue Target reflects changes since 2019 in the value of the Jamaican dollar (JMD) against the US dollar (USD) and changes in the cost of providing electricity products and services related to inflation; as well as JPS' performance against the operational targets established by the OUR for 2022.

Annual Revenue Target parameters in this filing are consistent with the OUR's determinations as published in the Final Determination. Performance and growth-related adjustments to the 2023 Annual Revenue Target (ART) comprise the following:

- dI growth adjustment of 39.54% to the 2022 approved revenue cap of J$38.78B
- Volumetric performance adjustment of positive J$0.23B
- System losses performance adjustment of negative J$0.49B
- Foreign exchange surcharge of positive J$0.99B
- Net interest expense surcharge of positive J$0.15B

The proposed 2023 ART reflecting these adjustments is **J$55.0B**. In reviewing the proposed 2023 ART the following should be noted:

1. System Losses Penalty:
JPS has repeatedly argued that the targets prescribed by the OUR do not reflect realistic conditions given the historical context of system losses in Jamaica and therefore run contrary to the principles espoused by Paragraph 37 of Schedule 3 to the Licence which mandates that targets must be reasonable and achievable.

The system losses target true-up applied for the 2023 is $0.49B in the proposed 2022 ART and the related tariff adjustment and bill impacts provided in Chapter 7.

2. Q-Factor:
JPS is proposing that the Q-Factor outcome for the 2023 Annual Adjustment Filing be set to zero (0) quality points due to challenges associated with the implementation of the OSI OMS in March 2022, particularly with data validation and quality assurance that have impacted the reliability indices, which was outside of JPS' control.

3. Extraordinary Rate Filing for 2022/2023 Capital Investment Projects:
JPS is also applying for revenue adjustment on projects that received approval as Extra Ordinary Projects arising from system risks not identified prior to submitting the 2019-2023 investment plan.

These projects were approved by the Office in the Extra-ordinary request made by JPS in 2022:

- Capacitor Banks Project
- GT10 Hot Gas Path Inspection
- Rock Fort
- Bogue Gas Turbines
- Critical Spares
- North East Coast Voltage Enhancement projects

As outlined in paragraph 12.13 of the 2022 JPS Annual Review Determination, the revenue adjustment for the projects is to be carried out in the 2023 Annual review. JPS is requesting that revenue uplift of US$6.6M be deferred to the 2024 Annual Rate Review.

Proposed ART for 2023

2023 Annual Tariff Adjustment Summary	
Item	**Amount ($Million)**
Revenue Cap 2022	38,783
dI Adjustment (39.54%)	16,298
Revenue Cap 2022 (Adjusted for Growth – dl)	**54,116**
Performance Adjustments (note 1)	
Foreign Exchange Surcharge	999
Interest Surcharge	154
Volumetric kWh	82
Volumetric kVA	195
Customer Charge	27
System Losses	(489)
	968
Q Factor	**-**
All Adjustments	**16,301**
2023 Annual Revenue Target	**55,084**

Regulatory Matters

The 2023 Annual Adjustment provides the Regulator with an opportunity to appreciate the Company's operational performance in 2022, and, in accordance with the Licence, make certain adjustments required as a result of its annual performance to the schedule of rates for implementation as of July 1, 2023. Paragraph 43 of Schedule 3 of the Licence states:

> *"The Licensee shall make annual filings to the Office at least sixty (60) days prior to the Adjustment Date. These filings shall include the support for the performance indices, the inflation and the proposed Non-Fuel Base Rates for electricity, and other information as may be necessary to support such filings…."*

In keeping with this provision of the Licence, the 2022 Annual Review will be the second annual adjustment to be fully incorporated under a forward-looking Revenue Requirement following a five-year Rate Review transitioning into Revenue Cap, as part of the Performance Based Rate-making Mechanism (PBRM). Notably, this application is being filed under circumstances where JPS has exercised its right of appeal against certain aspects of the 2021 and 2022 Annual Rate Determination and the 2019-2024 Rate Review Determination, pursuant to Condition 32 of the Licence. Whilst the Company awaits the establishment of the Tribunal to adjudicate these matters, the Company submits this Application without prejudice to its rights or positions in respect of the matters which are the subject of the appeal.

The annual adjustment in the Licence allows JPS to adjust its revenue target to reflect general movements in inflation, changes in service quality, changes in the base foreign exchange rate and, where applicable, an adjustment for unforeseen occurrences beyond management control not captured in the other elements of the PBRM. The mechanism also allows for a revenue surcharge which includes a true up for revenue, a system losses incentive mechanism and an FX surcharge, offset by net interest income received from customers.

In this Application, JPS requests the OUR's consideration and determination with respect to the following regulatory matters:

Billing Determinants: In applying the PBRM, the formula indicates that the volumetric adjustment for any year is dependent on the variance between the target billing determinants and those that were actually achieved during that year. Accordingly, the OUR introduced a 3% variance rule-based approach to deriving Energy Sales and KVA for 2021. The OUR however, departed from that approach for the 2022 Annual Determination Notice outlining that "giv*en the dynamics of the COVID-19 pandemic and the availability of more relevant data, it has opted to generate a new forecast for the 2022 Annual Review."*

The OUR's energy forecast as per the Final Determination of 3,237GWh was adjusted for 2022. The revised value is 3,072 GWh and represent a growth of approximately 3.1% relative to 2021 actual performance.

Electricity is expected to grow within the context of the broader economic recovery and the general return to normal operations for most sectors. As such, JPS is projecting year end electricity sales of 3,105 GWh, which represents a modest increase of 1.3 percent relative to 2022.

Proposed Targets for 2023

JPS regulatory regime is characterized by performance targets for a number of key variables that affect the costs, quality and reliability of service received by customers.

Q-Factor

JPS has made significant improvements to its outage management capabilities through the introduction of the OSI OMS. However, beyond its control, the Company has faced challenges with data validation and quality assurance that have impacted the reliability indices. As a result, JPS is proposing that the Q-Factor outcome for the 2023 Tariff Adjustment Filing be set to zero (0) quality points due to these challenges.

Heat Rate

Based on the heat rate performance obtained from JPS' updated forecasted model for July 2023 to June 2024, JPS' thermal heat rate is projected to finish at 9,379kJ/kWh barring the impact of unforeseen events.

Results of JPS Forecasted Thermal Heat Rate Model, July 2023 to June 2024

Heat Rate (kJ/kWh)	23-Jul	23-Aug	23-Sep	23-Oct	23-Nov	23-Dec	24-Jan	24-Feb	24-Mar	24-Apr	24-May	24-Jun	Year
JPS Thermal (2023\24)	9,360	9,629	9,306	9,312	9,279	9,415	9,302	9,354	9,346	9,332	9,713	9,335	**9,379**

In keeping with the principle of FCAM, JPS is proposing that its thermal heat rate target for July 2023 – June 2024 be maintained at the current target of **9,495kJ/kWh.** This would provide slightly more latitude than the 9,470kJ/kWh target to absorb impacts from possible risks not included in the base projection.

System Losses

JPS's internal focus is on execution of the projects planned for 2023. JPS is also committed to seeking public and private sector partnerships in order to lower the barrier to legitimate supply for low-income households and improving their economic prospects.

JPS expects its initiatives to yield a loss reduction of 50 GWh in 2023, and if the current trend of growth in GDP persists then a 0.5 percentage point reduction in total system losses is a reasonable projection. Consequently, JPS proposes the following targets for 2023 system losses as detailed in Chapter 5:

System Loss Component	Target (%)
Technical loss	7.90
Non-technical loss fully within the control of JPS	20.25
Total	**28.15**

Rate Adjustment and Bill Impacts

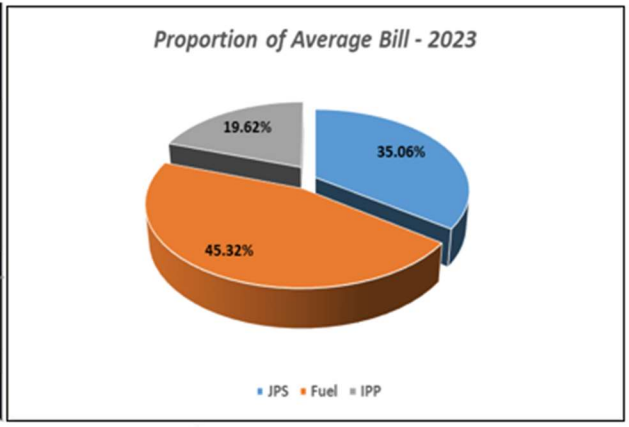
Recovery of the proposed 2023 ART in the 2023/24 period requires overall non-fuel tariff increase adjustment of 13.2% for approved target to be in real terms. This required tariff increase is derived by applying across-the-board equal percentage increase to the current tariffs based on the 2023 actual billing determinants. It represents a movement of J$0.33 cents relative to 2022. This reflects a marginal reduction of 0.69%.

Also depicted below is the relative proportion of the typical pre-tax bill, 36% of which is directly related to JPS, the remaining 64% goes toward to the costs of fuel and IPP, which are a pass-through and does not contribute to JPS' base rate approved by the OUR. That is, for every J$1 reflected on a customer's bill, only J$0.35 cents goes to JPS This however, would decrease to approximately J$0.30 cents if the General Consumption Tax (GCT) is applied.

Average 2023 Bill Impact

	Current Rates	JPS Propsed 2023
Annual Revenue Target (ART) -JSM	48,160	55,084
Variance JSM		*6,924*
ART Increase vs 2021		*14.38%*
Avg Non- Fuel JPS Forecast GWh	3,072	3,105
Average Non-Fuel Tariff(JS/kWh)	*15.68*	*17.74*
Non-fuel Tariff Increase		***13.15%***
Fuel & IPP Rates (JS/kWh)		
Average Fuel	23.55	21.15
Average IPP	9.86	9.86
Total Overall Average Tariff	49.08	48.75
Estimated Bill Impact		***-0.69%***

Percentage Share of the Avg Bill



All customers are expected an overall bill reduction with the exception of residential service and RT40, which will see a marginal increase of 0.8% and 0.2% respectively. Commercial and industrial customers will see reduction above 2.5%.

Conclusion

In summary, the 2023 AAF submission reflects a balance between customer interests, and fair treatment for the utility allowing JPS to meet its mandate to provide affordable and reliable service, convenience, security, improve its overall efficiency and enhance customer service delivery. The current AAF submission has been developed reflecting challenges and opportunities including the following:

- Impact of the COVID pandemic on investment in the capital infrastructure, which has dampened some of JPS' efforts in improving services to customers, increasing reliability, and supporting Jamaica's economic growth and expansion.
- Cost pressures attributable to uncontrollable factors, such as foreign exchange movements and global supply disruption.

In order to mitigate the impact of these drivers on the Revenue Requirement and to reduce the costs that influence pricing to its customers, JPS continues to modernize the grid by investing in smart devices on the network, upgrades and expansion of the transmission and distribution network.

1. PBRM Annual Adjustment

1.1 Introduction

The Electricity Licence 2016 was gazetted on January 27, 2016. The Licence shall hereinafter be cited as the "Licence".

Paragraphs 1 and 2 of Condition 15 of the Licence which governs Price Controls, states that:

1. *"The Licensee is subject to the conditions in Schedule 3.*

2. *The rates to be charged by the Licensee in respect of the Supply of electricity shall be subject to such limitation as may be imposed from time to time by the Office."*

Schedule 3 of the Licence prescribes that "*the basis of rate setting shall be the revenue cap principle which looks forward at five (5) year intervals and involves the de-coupling of kilowatt hour sales and the approved revenue requirement."*

Paragraphs 1 to 5 of Schedule 3 state as follows:

1. *"The rates shall be charged to customers in accordance with rate classes approved by the Office.*

2. *The rates are comprised of the following: a. Non-fuel rate; and b. Fuel rate.*

3. *The fuel rate shall be adjusted by the Office monthly in accordance with the Fuel Cost Adjustment Mechanism.*

4. *The non-fuel rate shall be reviewed by the Office:*
   a. In rate reviews that are customarily done every five years;
   b. In extra-ordinary rate reviews which may be conducted in between rate reviews; and
   *c. Annually under the Performance Based Rate-making Mechanism ("**PBRM**") adjustment.*

5. *All rates shall be determined by the Office."*

Outlined below are paragraphs 42 to 46 of Schedule 3, which prescribe the methodology to be used in making an Annual Performance-Based Rate-Making Filing for Rates under the mechanism. Paragraphs 42 to 46 provide as follows:

42. *The methodology to be utilised by the Office in computing the PBRM is set out in detail in **Exhibit 1.***

43. The Licensee shall make annual filings to the Office at least sixty (60) days prior to the Adjustment Date. These filings shall include the support for the performance indices, the inflation, and the proposed non-fuel rates for electricity and other information as may be necessary to support such filings.

44. These filings shall also propose the non-fuel rates scheduled to take effect on the Adjustment Date for each of the rate categories. These rates shall be set to recover the annual revenue requirement for the same year in which the proposed rates take effect, given the target billing determinants.

45. The target billing determinants shall be based on the actual billing determinants for the immediately preceding calendar year. The Office is empowered to adjust the target billing determinants for known and measurable changes anticipated in relation to the following year.

46. The Office shall apply the following adjustment factors to the non-fuel rate at each PBRM:

*a. The **Q-Factor**, which is the annual allowed price adjustment to reflect changes in the quality of service provided by the Licensee to its customers. The Office shall measure the quality of service versus the annual target set in the 5 year rate review determination.*

*b. The **H-Factor**, if applicable, will reflect the heat rate as defined by the Office of the power generated in Jamaica versus a pre-established yearly target in the 5 year rate setting determination by the Office.*

*c. The **Y-Factor** reflects the achieved results versus the long-term overall system losses target.*

*d. The **Z-Factor** reflects the adjustment to the non-fuel rate due to special circumstances. The Z factor is the allowed percentage increase in the Revenue Cap due to any of the following special circumstances:*

(i) Any special circumstances that satisfy all of the following:

a) affect the Licensee's costs or the recovery of such costs, including asset impairment adjustments;

b) are not due to the Licensee's managerial decisions;

c) have an aggregate impact on the Licensed Business of more than $50 million in any given year; and

d) are not captured by the other elements of the revenue cap mechanism.

(ii) where the Licensee's rate of return with respect to the Licensed Business is one (1) percentage point higher or three (3) percentage points lower than the approved regulatory target (after taking into consideration the allowed true-up annual adjustments, special purpose funds included in the Revenue Requirement, awards of the Tribunal (sic) and determinations (sic) of the Office and adjustments related to prior accounting periods). This adjustment may be requested by the Licensee or the Minister or may be applied by the Office;

(iii) where the Licensee's capital & special program expenditure are delayed and such delay results in a variation of 5% or more of the annual expenditure, the Z-factor adjustment will take into consideration the over–recovery of such expenditures plus a surcharge at the WACC;

(iv) Government Imposed Actions;

(v) where the Licensee demonstrates and the Office agrees that an extra-ordinary level of capital expenditure or a special programme is required (i.e. greater than 10% for any given year relative to the previously agreed five year Business Plan); or

(vi) where the Licensee is required to make a change to the Guaranteed Standards in Condition 17(5) and such change will have a financial impact on the Licensee in an amount greater than Fifty Million Jamaican dollars (J$50,000,000.00) during any rate review period.

1.2 Computation of Exhibit 1 Parameters

The annual adjustment in the Licence allows JPS to adjust its revenue target to reflect general movements in inflation, changes in service quality, changes in the base foreign exchange rate, and where applicable an adjustment for unforeseen occurrences beyond management's control not captured in the other elements of the PBRM. The mechanism also allows for a revenue surcharge which includes a true up for revenue, a system losses incentive mechanism and a FX surcharge, offset by net interest income received from customers.

The Annual Revenue Target parameters in this filing are consistent with the OUR's Determinations as published in the 2019-2024 Rate Review Determination Notice.

1.2.1 The Revenue Cap for 2023 (RC_{2023})

The Licence describes the parameter RCy as the revenue cap for year "y" which should be established in the most recent Rate Review. The Licence contemplates that for each year of the Rate Review period, the parameter RCy will be established without factoring inflation. In making annual adjustments to the Revenue Cap, the inflation between the Base Year and the current adjustment period would be factored into the dI parameter.

Determination #29 of the 2019-2024 Rate Review Determination ("Final Determination") approved RC of J$38,783M for 2023 subject to Z-Factor conditions set out in Schedule 3 of the Licence and the Final Criteria.

Based on this determination and in the absence of an order from the Tribunal under Condition 32(1)(iii) of the Licence to stay this determination and certain other determinations in the Final Determination until the outcome of the Licensees appeal, the revenue cap for 2023 is J$38,783M.

1.2.2 The Rate of Change of Revenue Cap (dPCI)

The annual PBRM filing will follow the general framework where the rate of change in the Revenue Cap will be determined through the following formula:

$$dPCI = dI \pm Q \pm Z$$

where:

dI = the growth rate in the inflation and JMD to USD exchange rate measures;

Q = the allowed price adjustment to reflect changes in the quality of service provided to the customers versus the target for the prior year;

Z = the allowed rate of price adjustment for special reasons, not under the control of the Licensee and not captured by the other elements of the formulae.

The growth rate (dI) represents the changes in the value of the JMD against the USD and the inflation in the cost of providing electricity products and services. Its calculation requires parameters for the US portion of the total non-fuel expenses and the US debt service portion of the non-fuel expenses.

In the 2019-2024 Rate Review Determination the OUR calculated approved RC for 2022 adjusted for dPCI where the OUR used the following parameters for these factors which are consistent with the parameters used in the previous Annual Adjustment Filings since 2016:

- USPb =80%; and
- USDSb = 6.88%;

The base exchange rate approved in the 2019-2024 Rate Review Determination is EXb =J$128:US$1.

The application of the adjustment factor dI will result in an increase of 39.54% to the base non-fuel Revenue Requirement in Jamaica dollar terms, derived using the following factors:

- Jamaican point-to-point inflation (INFJ) between March 2019 and March 2023 of 30.35%, derived from the CPI data[1] published by STATIN (see Appendix A);

- U.S. point-to-point inflation rate (INFUS) between March 2019 and March 2023 of 18.74%, derived from the U.S. Department of Labour statistical data[2] (see Appendix B); and

- The 21.09% increase in the Base Exchange Rate ($\frac{EX_n - EX_b}{EX_b}$) from J$128: US$1 to J$155: US$1.

Although JPS' 2019-2024 Rate Review application was expressed in 2018 values (for both Jamaican and US denominated costs), paragraph 4.14 of the Final Determination states that this reference was an "inadvertent error, as it should have instead said '2019 real prices'". Therefore, in keeping with this amendment the 2019 real prices were adjusted to 2022 dollars which is reflected in the conversion in the CPI from March 2019 to March 2022.

The Revenue Growth Cap (dPCI) of 39.54% is the full adjustment that is to be made and is calculated by adding the Q-Factor and Z-Factor adjustments to the dI.

- The Q-Factor is based on three quality indices until revised by the Office and agreed between the Office and the Licensee. The Q-Factor adjustment factor is 0% and is detailed in Chapter 3; and

- The computed value of the Z-factor is 0% and is further discussed in Chapter 3.

Table 1-1 below sets out the details of the computation of the growth rate, dPCI and Table 1-2 shows the 2023 revenue cap adjustment for dPCI escalation factor.

[1] Obtained from the Statistical Institute of Jamaica
[2] Obtained from U.S Bureau of Labor Statistics Website,

Table 1-1: Escalation Factor

Annual Adjustment Clause Calculation			
ESCALATION FACTOR (dI) based on point to point data as at March 2023			
Line	Description	Formula	Value
L1	Base Exchange Rate		128.00
L2	Proposed Exchange Rate		155.00
L3	Jamaican Inflation Index		
L4	CPI @ Mar 2023		128.00
L5	CPI @ March 2019		98.20
L6	US Inflation Index		
L7	CPI @ Mar 2023		301.84
L8	CPI @ March 2019		254.20
L9	Exchange Rate Factor	(L2-L1)/L1	21.09%
L10	Jamaican Inflation Factor	(L4-L5)/L5	30.35%
L11	US Inflation Factor	(L7-L8)/L8	18.74%
L12	Escalation Factor (dI)	L9* {0.8+(0.8-0.0688)*L11}+(0.8-0.0688)*L11+(1-0.8)*L10	39.54%
L13	Q Factor		0.00%
L14	Z Factor		0.00%
L13	**Escalation Factor net of Q and Z**	**dI + Q + Z**	39.54%

Table 1-2: 2022 Revenue Cap Adjustment

Computation of Revenue Cap for 2023			
L1	2023 Revenue Cap (as in Determination)		38,783,000,000
L2	dPCI (dI + Q + Z)		39.54%
L3	Adjusted RC_{2023}	L1 * (1+L2)	54,116,301,878

1.2.3 Foreign Exchange and Interest Surcharges

Paragraphs 31 and 53 of Schedule 3 of the Licence provide for the inclusion of foreign exchange (FX) losses and net interest expense/(income) in the Revenue Requirement to be set at the time of a Rate Review. The annual adjustment mechanism described in Exhibit 1, includes a true-up for FX losses (FX surcharge) which is offset by interest surcharge on customer arrears, such that:

$$SFX_{y-1} = AFX_{y-1} - TFX$$

$$SIC_{y-1} = AIC_{y-1} - TIC$$

where:

SFXy−1 = *Annual foreign exchange result loss/(gain) surcharge for year "y-1". This represents the annual true-up adjustment for variations between the foreign exchange result loss/(gain) included in the Base Year revenue requirement and the foreign exchange result loss/(gain) incurred in a subsequent year during the rate review period.*

AFXy−1 = *Foreign exchange result loss/(gain) incurred in year "y-1".*

TFX = *The amount of foreign exchange result loss/(gain) included in the revenue requirement of the Base Year*

SICy-1 = *Annual net interest expense/(income) surcharge for year "y-1". This represents the annual true-up adjustment for variations between the net interest expense/(income) included in the Base Year revenue requirement and the net interest expense/(income) incurred in a subsequent year during the rate review period. The net interest income shall be deducted from the revenue requirement while net interest expense shall be added to the revenue requirement.*

AICy-1 = *Actual net interest expense/(income) in relation to interest charged to customers and late payments per paragraph 49 to 52 of Schedule 3 in year "y-1".*

TIC = *The amount of net interest expense/(income) in relation to interest charged to customers and late payments included in the revenue requirement of the Base Year as per Schedule 3 Exhibit 1*

At the time of an annual adjustment, the FX surcharge is computed as the actual FX loss incurred during the previous year less the target for FX loss for that year set at the last Rate Review. Similarly, the interest surcharge is calculated as the actual interest income (including net late payment fee) less the provisions made for interest income in the Revenue Requirement.

This annual adjustment mechanism is also referenced in paragraph 3.7.3 of the Final Criteria, which notes that random events, such as storms, foreign exchange losses/gains and changes in tax policy, that impact JPS' costs are provided for through the Annual Revenue Target Mechanism; the Z-Factor component of the Revenue Cap Mechanism; and the Electricity Disaster Fund.

Schedule 3 Exhibit 1 of the Licence defines target net interest income (TIC) as the amount of net interest expense/(income) in relation to interest charged to customers and late payments included in the revenue requirement of the Base Year.

Further, the Final Determination sets out that prudently incurred costs associated with the issuance of debt such as commitment fees, arrangement fees, due diligence fees, breakage costs and refinancing fees should be included in the non-fuel operating costs/expenses.

Paragraph 31 of Schedule 3 of the Licence also includes interest and other financial costs on other borrowings; working capital requirements not associated with capital investment; and foreign exchange result loss/(gain) in non-fuel operating costs of JPS' Revenue Requirement. Consistent with Criterion 1 of the Final Criteria, financial costs on the borrowing includes debt issuance cost.

In accordance with Criterion 1 of the Final Criteria, JPS' financing costs included in the Revenue Requirement is comprised mainly of interest costs associated with short-term debt, the amortization of debt issuance costs, and interest on customer deposits, which are offset by interest (finance) income earned as discussed in Section 13.4 of the 2019-2024 Rate Review application.

The Final Determination approved the following provisions in the 2022 Revenue Requirement for FX losses and interest income:

- **FX Losses (TFX):** Of J$280M (paragraph 11.290) and when adjusted at the 2022 growth rate dI of 33.02%, the FX losses provision for 2022 is J$372.5M.

- **Net interest expense (TIC):** Provisions of J$52.9M of Interest on Customer Deposits and J$212M of Debt Issuance Costs (as depicted by Table 11.12) was offset by J$317M and Expense/Income Annual Adjustment of J$50M (as per Tables 11.34 of the Final Determination and 4.4 of the Annual Determination). When adjusted for the approved 2022 growth rate (dI) of 33.02%, the approved TIC provision for 2022 is J$136.5M.

Paragraph 53 of Schedule 3 of the Licence stipulates that *"[t]here shall be an annual true-up adjustment in relation to the actual net interest expense/(income) paid/(earned) by the Licensee in any year compared to the amount included in the Base Year*."

Schedule 3, Paragraph 55 of the Licence stipulates that *"[t]he Licensee shall be entitled to an adjustment to the non-fuel rate, based on the difference between the anticipated foreign exchange result loss/(gain) in the Revenue Cap for the previous year and the actual foreign exchange result incurred in the prior year related to Working Capital and Debt Service driven by JMD to USD foreign exchange results*."

Accordingly, the actual net interest expense in relation to interest charged to customers in 2022 reflects the earned interest income consistent with the requirement in Schedule 3, paragraph 53 of the Licence that the true-up adjustment shall be in relation to actual net interest expense paid / net interest income earned. The earned income is based on the distribution of the payments made and credit balances applied to the interest charge for commercial and government accounts created in Customer Suite.

Similarly, in accordance with the requirement in paragraph 55 of Schedule 3 of the Licence, the FX loss incurred during 2022 reflect actual (realised) FX loss based on the incurred currency loss and gains.

Actual realised 2022 interest income in relation to interest charged to commercial and government accounts was J$362M offset by actual realized interest expense of J$278.2M paid on customer deposits, bank overdraft, interest expense and debt issuance costs. Actual late payment fees in 2022 were J$85.5M. FX losses in 2022 reflect realised currency losses of J$368.4M.

The AFX is computed as actual realised FX losses at the average exchange rate for 2022 of J$153.48:US$1. Similarly, the actual net interest income (AIC) is computed as actual net interest income at the same exchange rate. Based on these assumptions, the foreign exchange and interest surcharges for 2022 are computed as illustrated in *Table 1-3*.

Table 1-3: Computation of FX and Interest Surcharges

FX and Interest Surcharge for 2022 (SFX_{2022} - SIC_{2022})			
Line	**Description**	**Formula**	**Value**
	FX Surcharge		
L1	TFX_{2022}		372,456,000
L2	AFX_{2022}		1,265,596,080
L3	**SFX_{2022}**	**L2-L1**	**893,140,080**
	Interest Surcharge		
L4	Actual net interest expense/(income) for 2022		(84,171,502)
L5	Actual Net Late Payment fees for 2022		85,492,350
L6	AIC_{2022}	L4+L5	1,320,849
L7	TIC_{2022}		(136,489,162)
L8	**SIC_{2022}**	**L6-L7**	**137,810,010**
L9	**SFX_{2022} - SIC_{2022}**	**L3-L8**	**755,330,070**

1.2.4 Revenue Surcharge

The revenue surcharge is comprised of: (1) the true-up for volume adjustments; and (2) the true-up for system losses, the targets of which are required to be reasonable and achievable pursuant to paragraph 37 of Schedule 3 of the Licence. These true-ups reconcile JPS' actual performance during 2022 against the targets set for that year, and result in a J$166 million reduction to the Annual Revenue Target (ART) for 2023. The calculation for the volume adjustment and system losses true-ups is detailed in Section 1.2.4.1 and 1.2.4.2.

1.2.4.1 True up for Volumetric Adjustments

In accordance with the methodology outlined in Paragraphs 42 to 56 of Schedule 3 of the Licence, the volumetric adjustment for any year is dependent on the variance between the target billing determinants and those that were actually achieved during that year.

Billing determinants for 2022 were approved in paragraph 7.6.4 of the 2022 Annual Determination as shown below:

- Energy sales: 3,072 GWh
- Billing demand: 5,299,408 kVA
- Customer forecast: 694,708

The total revenue that would be generated by the tariffs approved in the Final Determination multiplied by the approved billing determinants yields an Annual Revenue Target of J$48.16B as shown in *Table 1-4*.

Table 1-4: Expected Revenue Target (J$): 2022

Class		Customer	Energy Revenue				Demand (KVA) revenue				Total Revenue
			Std.	Off-Peak	Part Peak	On-Peak	Std.	Off-Peak	Part Peak	On-Peak	
Rate 10	LV < 100	4,291,301,736	4,263,126,772	-	-	-					8,554,428,508
Rate 10	LV > 100	-	12,582,547,223	-	-	-					12,582,547,223
Rate 20	LV	1,045,174,045	5,781,920,851	-	-	-					6,827,094,896
Rate 40	LV - Std	188,161,987	4,466,013,530	-	-	-	6,864,611,459				11,518,786,976
Rate 40	LV - TOU	11,727,691	-	296,589,440	274,440,668	79,854,501		98,984,171	343,753,120	380,718,964	1,486,068,555
Rate 50	MV - Std	13,180,680	1,001,945,586	-	-	-	1,349,297,162				2,364,423,427
Rate 50	MV - TOU	2,490,837	-	100,602,350	87,488,726	26,558,634		63,724,765	167,515,814	160,218,025	608,599,150
Rate 70	MV -STD	2,075,698	1,167,993,225	-	-	-	1,903,804,752				3,073,873,675
Rate 70	MV -TOU	415,140	-	75,999,430	95,560,140	52,694,254		40,183,415	113,336,396	146,819,205	525,007,980
Rate 60	LV	7,867,574	591,841,540	-	-	-					599,709,114
		13,266,070	6,790,086								20,056,156
TOTAL		5,575,661,458	29,862,178,812	473,191,220	457,489,534	159,107,389	10,117,713,372	202,892,351	624,605,330	687,756,194	48,160,595,661

This is not equal to the approved revenue cap for 2022 of J$50.185B as stated in Determination 1. Therefore, to appropriately calculate the revenue targets to be used in the surcharge the revenues as shown in *Table 1-4* are scaled so that the total will equal to the approved revenue cap for 2022 (shown in *Table 1-5* below).

Table 1-5: Corrected Approved Revenue Target: 2022

Class		Customer Revenue	Energy Revenue				Demand (KVA) revenue				Total Revenue
			Std.	Off-Peak	Part Peak	On-Peak	Std.	Off-Peak	Part Peak	On-Peak	
Rate 10	LV < 100	4,471,715,154	4,442,355,667.79	-	-	-					8,914,070,822
Rate 10	LV > 100	-	13,111,538,306	-	-	-					13,111,538,306
Rate 20	LV	1,089,114,890	6,025,002,360	-	-	-					7,114,117,250
		-	-	-	-	-					-
Rate 40	LV - Std	196,072,628	4,653,772,120	-	-	-	7,153,211,071	-	-	-	12,003,055,819
Rate 40	LV - TOU	12,220,743	-	309,058,550	285,978,607	83,211,716	-	103,145,629	358,205,069	396,725,019	1,548,545,334
Rate 50	MV - Std	13,734,817	1,044,069,034	-	-	-	1,406,023,844	-	-	-	2,463,827,696
Rate 50	MV - TOU	2,595,556	-	104,831,839	91,166,896	27,675,203	-	66,403,859	174,558,455	166,953,856	634,185,664
Rate 70	MV -STD	2,162,963	1,217,097,591	-	-	-	1,983,843,850	-	-	-	3,203,104,405
Rate 70	MV -TOU	432,593	-	79,194,572	99,577,646	54,909,607	-	41,872,792	118,101,246	152,991,727	547,080,183
Rate 60	LV	8,198,340	616,723,536	-	-	-					624,921,876
		13,823,797	7,075,553	-	-	-					20,899,350
TOTAL		5,810,071,482	31,117,634,168	493,084,961	476,723,150	165,796,526	10,543,078,766	211,422,281	650,864,770	716,670,601	50,185,346,705

Using these adjusted revenues as the basis, the Non-fuel Energy, Customer Charge and Demand revenues targets used in the volumetric true-up for 2022 are calculated as shown in *Table 1-6* below:

Component of Target	J$M
Revenue Target for Energy	32,253
Revenue Target for Demand	12,122
Revenue Target for Customer Charges	5,810
2022 Approved Revenue Cap (as in Determination)	50,185

As illustrated in

Table 1-7, TUVol2022 is determined by substituting the values computed in *Table 1-6* above. The 2022 volumetric adjustment is a J$207.8M increase in the ART before WACC adjustment.

Table 1-7: Computation of Volumetric Adjustment

Volumetric Adjustment TUVol2022			
Line	**Description**	**Formula**	**Value**
	Energy Surcharge		
L1	kWh $Target_{2022}$		3,071,939,033
L2	kWh $Sold_{2022}$		3,064,925,059
L3	Revenue Target for Energy		32,253,238,805
L4	kWh Surcharge	(L1-L2)/L1*L3	73,641,887
	Demand Surcharge		
L5	kVA $Target_{2022}$		5,299,408
L6	kVA $Sold_{2022}$		5,223,344
L7	Revenue Target for Demand		12,122,036,418
L8	kVA Surcharge	(L5-L6)/L5*L7	173,991,018
	Customer Count Surcharge		
L9	#Customer Charges $Target_{2022}$		694,708
L10	#Customer Charges $Billed_{2022}$		691,823
L11	Revenue Target for Customer Charges		5,810,071,482
L12	Customer Charges Surcharge	(L9-L10)/L9*L11	24,127,208
L13	**$TUVol_{2022}$**	**L4+L8+L12**	**271,760,113**

1.2.4.2 System Losses Adjustment

As stated in the Licence, the annual non-fuel adjustment factor includes the system losses incentive mechanism. The system losses true-up, represented in the formulaic representations as TULos is computed by first disaggregating system losses into three (3) components: TL, JNTL and GNTL where:

TL = Technical Losses

JNTL = Portion of Non-technical losses which is completely within JPS' control

GNTL = Portion of Non-technical losses which is not completely within JPS' control

Each component of system loss is then measured against a target that would be set by the OUR as shown in the following equations.

Yay-1 = Target System Loss "a" Rate%y-1 – Actual System Loss "a" Rate%y-1

Yby-1 = Target System Loss "b" Rate%y-1 – Actual System Loss "b" Rate%y-1

Ycy-1 = (Target System Loss "c" Rate%y-1 – Actual System Loss "c" Rate%y-1) * RF

where RF = The responsibility factor determined by the Office, is a percentage from 0% to 100%.

Schedule 3, Exhibit 1 of the Licence stipulates that the responsibility factor is to be "*determined by the Office, in consultation with the Licensee, having regard to the (i) nature and root cause of losses; (ii) roles of the Licensee and Government to reduce losses; (iii) actions that were supposed to be taken and resources that were allocated in the Business Plan; (iv) actual actions undertaken and resources spent by the Licensee; (v) actual cooperation by the Government; and (vi) change in the external environment that affected losses*".

The variance of the three losses components from target is used to compute a total variance Yy-1 in year "y-1" as shown below:

Yy-1 = Yay-1 + Yby-1 + Ycy-1

Finally, TULosy-1 for year "y-1" (the year preceding the adjustment year) is computed as:

TULosy-1 = Yy-1*ARTy-1

In order to complete the calculations for the losses true-up, TULos2021, the actual system losses for the year must be disaggregated into the respective three (3) components stipulated in the Licence to enable the comparison against the targets set by the OUR in the Final Determination. Once disaggregated, the three (3) components will be computed separately and re-aggregated to derive the losses penalty.

Determination #21 of the Final Determination approved system losses targets for the Rate Review period, which are as follows for 2022:

- Technical Losses (TL) Target: **7.67%**
- Non-Technical Losses within the control of JPS (JNTL) Target: **4.24%**
- Non-Technical Losses not fully within the control of JPS (GNTL) Target: **10.75%**
- Responsibility Factor (RF) for Non-Technical Losses to JPS' NTL that are not totally within its control: **20%**

Based on the allocation as outlined Table 14.26 of the Final Determination and the absence of a stay by the Tribunal under Condition 32(1)(iii) of the Licence, these targets remain as the approved targets from the OUR unless JPS is successful in its pending appeal of the OUR's decision.

Using these targets and the actual system losses performance for 2022, the system losses penalty is $437.3M as shown in *Table 1-8*.

Table 1-8: Computation of TULos2022

System Losses Adjustment TULos2022			
Line	**Description**	**Formula**	**Value**
L1	Actual TL_{2022}		7.77%
L2	Target TL_{2022}		7.67%
L3	Ya_{2022}	(L2-L1)	-0.10%
L4	Actual $JNTL_{2022}$		3.85%
L5	Target $JNTL_{2022}$		4.24%
L6	Yb_{2022}	(L5-L4)	0.39%
L7	Actual $GNTL_{2022}$		16.74%
L8	Target $GNTL_{2022}$		10.75%
L9	RF		20.00%
L10	Yc_{2022}	(L8-L7)*L9	-1.20%
L11	Y_{2022}	L3 + L6 + L10	-0.91%
L12	ART_{2022}		48,160,407,073
L13	**$TULos_{2022}$**	**L11*L12**	**(437,296,496)**

2. Q-Factor Adjustment

2.1 Introduction

The Q-Factor Annual Performance-Based Rate-Making Mechanism, incorporated in the price control regime is defined under Schedule 3 (Exhibit 1) of the Electricity Licence, 2016 ("the Licence").

At each Annual Review during a revenue cap period, the OUR is required to measure JPS' annual quality of service performance against the annual target set in the 5-Year Rate Review Determination Notice. The aim is to derive the Q-Factor adjustment applicable to the Revenue Cap (RC), as per the annual PBRM framework.

The Q-Factor provision of the Licence, "the reliability of supply" criteria form the core of the defined Q-Factor mechanism, which is the main focus of this regulatory review.

In accordance with the established methodology which was comprehensively assessed and utilized by both JPS and the OUR. The Q-Factor mechanism is included in the annual revenue adjustment formula as a component of dPCI. That is, the allowed price adjustment to reflect changes in the quality of service provided to customers. Specifically:

$dPCI = dI \pm Q \pm Z$

The Q-Factor annual targets for the 2019-2023 Rate Review period, as outlined in the Final Determination, was determined by the OUR. The annual reliability targets for the 2023 Tariff Adjustment Filing to be applied to the 2022 outage dataset are as follows:

- SAIDI: 1,344.70 minutes
- SAIFI: 11.22 times
- CAIDI: 120.25 minutes

The 2023 Tariff Adjustment Filing is the fourth year for the application of the Q-Factor mechanism. The application for the 2020 and 2021 filings were set to zero by the OUR, while the 2022 filing was set to -9 quality points. The 2023 filing will therefore be the second year, in the 2019-2023 Rate Review Period, that the Q-Factor mechanism is slated to be applied, based on JPS reliability performances against the OUR's established annual targets.

The dataset used to compute the 2022 reliability performance was extracted from the old Ventyx ABB OMS for the period January – February 2022, and the new Open Systems International (OSI) Outage Management System (OMS) data for the period March – December 2022. Given that the annual Q-Factor Targets were established based on the old Ventyx OMS, there have been an alignment bias in the expected outcomes due the massive data calibration issues caused by the new OSI OMS's technical and configuration challenges. With this JPS is therefore, proposing that the entire 2022 performance be granted as a data review and post implementation data resolution period, effectively setting the Q Factor mechanism to 0 quality points for the annual Tariff Adjustment Review in 2023.

The OSI OMS was commissioned in March 2022 without critical variances which would prevent it to go-live. Notwithstanding, some non-critical post implementation challenges were identified, which impacted the outage data quality and completeness, as shown in Table 2-4. These challenges persisted and required resolution throughout the year. This new OMS will ensure that JPS realizes the benefits of a fully integrated OMS with its other operational and enterprise systems.

The annual OUR performance targets against which JPS will be evaluated are highlighted in *Table 2-1* below:

Table 2-1: OUR Approved Q-Factor Annual Targets for 2019-2024 Rate Review Period

	Description	Target SAIDI	Target SAIFI	Target CAIDI
2016-2018	**BASELINE**	**$SAIDI_{Base}$(1,582)**	**$SAIFI_{Base}$(12.9)**	**$CAIDI_{Base}$(122.7)**
2019	2019 -2020 Annual Review	No Pre-set Target	No Pre-set Target	No Pre-set Target
2020	2020 -2021 Annual Review	$SAIDI_{Base}$*(1-0.05)	$SAIFI_{Base}$*(1-0.04)	$CAIDI_{Base}$*(1-0.01)
2021	2021-2022 Annual Review	$SAIDI_{Base}$*(1-0.11)	$SAIFI_{Base}$*(1-0.09)	$CAIDI_{Base}$*(1-0.02)
2022	**2022-2023 Annual Review**	**$SAIDI_{Base}$*(1-0.15)**	**$SAIFI_{Base}$*(1-0.13)**	**$CAIDI_{Base}$*(1-0.02)**
2023	2024 PBRM Adjustment	$SAIDI_{Base}$*(1-0.17)	$SAIFI_{Base}$*(1-0.15)	$CAIDI_{Base}$*(1-0.02)

The OUR's evaluation of JPS' annual Q-Factor performance, during the Rate Review Period, encompasses the following activities:

- Assessment of JPS's system reliability performance for 2022 in terms of power outages on the T&D network, resulting in supply interruptions to customers.
- Analysis of outage causes to determine the main drivers of electricity supply interruptions and the focus of the JPS reliability improvement strategies.
- Derivation of the defined reliability indices and Determination of the Q-Factor applicable to the Revenue Cap for the reporting year.

Generally, the reliability indices agreed upon with the OUR for the Q-Factor assessments are:

- SAIFI – System Average Interruption Frequency Index
- SAIDI – System Average Interruption Duration Index
- CAIDI – Customer Average Interruption Duration Index
- MAIFI – Momentary Average Interruption Frequency Index (Captured, but does not form a part of the Q-Factor mechanism)

The measurement of the JPS' annual quality of service performance using the quality indices is guided by the following performance criteria/quality points system:

- Above Average Performance (greater than 10% below target) – worth 3 quality points on either SAIFI, SAIDI or CAIDI;
- Dead Band Performance (within ±10% of target) – worth zero (0) quality points on either SAIFI, SAIDI or CAIDI; and
- Below Average Performance (greater than 10% above target) – worth -3 quality points on either SAIFI, SAIDI or CAIDI.

As outlined in section 7.4.3 of JPS' 2019-2024 Rate Review Application, JPS adopts the Institute of Electrical and Electronics Engineer (IEEE) standards. However, since the OUR does not recognize the exclusion of the 2.5 beta methodology events for Major Event Days, these were not excluded from the JPS annual reliability performances. Pursuant to Condition 11(2) of the Electricity Licence, 2016, Force Majeure Events, were submitted to MSET for subsequent exclusion, while Non-Reportable outages were excluded, as per the established Non-Reportable Dictionary.

Based on Determination # 22 of the 2019-2024 Rate Review Determination Notice, the OUR determinations on the Q-Factor are as follows:

- For each Annual review application during the Rate Review period, JPS shall include an outage cause analysis to support its Q-Factor proposal.
- JPS shall put measures in place to ensure that Non-Reportable forced outages shall not exceed 5% of total forced outages reported for each year.
- JPS shall report to the OUR all momentary interruptions that occurred on the system, which it is able to capture along with the related MAIFI calculations.
- JPS shall submit to the OUR, a detailed Reliability Report on a quarterly basis, which shall include all the data requirements applicable to the Annual Outage Data Report.
- The status/progress of reliability projects being implemented.

2.2 JPS' Reliability Performance 2022

For the 2023 Annual Review Filing, JPS established the overall system reliability performance for 2022 after the evaluation using the 2022 Annual Outage Dataset. The resulting reliability performance measurements, as represented by the SAIFI, SAIDI, CAIDI, and MAIFI, are summarized in *Table 2-2* below. For reference, historical calibrated performance data for 2019-2020, are also provided.

Table 2-2: JPS Reported System Reliability Performance for 2022

	JPS REPORTED 2019 & 2022 SYSTEM RELIABILITY PERFORMANCE					
	YEAR	**# Reportable forced outages**	**SAIDI (mins/customer)**	**SAIFI (interruptions/customer)**	**CAIDI (mins/interruption)**	**MAIFI (interruptions/customer)**
With FM	**2019**	44,389	1,375.2	11.7	117.1	7.6
	2020	57,726	1,486.8	8.6	173.2	13.8
	2021	57,333	1862.7	7.7	243.2	12.0
	2022	89,884	1983.8	7.5	266.1	36.5
Without FM	**2020**	-	1278.3	7.9	161.8	-
	2021	-	1187.8	6.8	175.2	-
	2022	-	1935.0	7.4	263.3	-

JPS' 2022 performance constitutes forced, sustained, and reportable outages. This includes the contribution of Force Majeure Events and the exclusion of outages attributed to IPPs. JPS' performance versus Q-Factor targets are presented in *Table 2-3* below:

Table 2-3: JPS 2022 and 2021 Performance versus Q-factor Targets

	SAIDI (min/customer)			SAIFI (interruptions/customer)			CAIDI (min/customer)		
	OUR Q-factor Target	**JPS' Actual**	**Variance (%)**	**OUR Q-factor Target**	**JPS' Actual**	**Variance (%)**	**OUR Q-factor Target**	**JPS' Actual**	**Variance (%)**
With FM	1,344.70	1983.8	-48%	11.22	7.5	34%	120.3	266.1	-121%
Without FM	1,344.70	1935.0	-44%	11.22	7.4	34%	120.3	263.3	-119%
With FM	1408.0	1862.7	-32%	11.7	7.7	34%	120.2	243.2	-102%
Without FM	1408.0	1187.8	16%	11.7	6.8	42%	120.2	175.2	-46%

Based on the recommendation by KEMA Inc., in their Audit of JPS' Q-Factor Report (section 4.4), it was recommended that the format for reporting reliability indices, should include Force Majeure Events along with the various outage classes. Force Majeure events are highlighted in the annual dataset to facilitate the exclusion of these events from JPS' performance as referenced in *Table 2-3.* JPS' Licence provides for this exclusion, subject to MSET's approval. With the exclusion of Force Majeure events, JPS has performed 34% better for SAIFI; 44% worse for SAIDI and 119% worse for CAIDI, when compared to the established Q-Factor targets. This would result in a quality point of -3.

With the utilization of the Ventyx and OSI OMS data, JPS' has seen an increase in the reliability indices in 2022, when compared to previous years in the 2019-2023 Rate Review Period. This is

mainly due to the issues, as outlined in *Table 2-4*, concerning the quality and completeness of the outage data, impacted by the post implementation challenges from the new OSI OMS. When compared to historical trends, the 2022 performance data is erratic and inconsistent with previous performance. As was communicated in the OUR Commissioning Report as well as the 2022 Tariff Adjustment Filling, consistent with industry trends, reliability performance tends to worsen due to the increased accuracy of a new or upgraded OMS. This is especially due to the fact that multiple data issues arise with the interfacing of the various operational and enterprise systems with the OSI OMS.

The 2022 SAIDI performance shows a significant increase of 63%, when compared to 2021, with the 2022 SAIDI performance being 1,935.03 minutes versus 1,187.8 minutes, for 2021 excluding Force Majeure Events. Since the start of the 2019-2023 Rate Review period, JPS has seen an average of 7% annual reduction in SAIDI, using data from the old Ventyx OMS, excluding Force Majeure. (*See Table 2-3).*

The 2022 SAIFI performance represents 7.5 times, when compared to 7.7 times in 2021. JPS' SAIFI performance is attributed to the benefits realized from its reliability improvement programmes outlined in Table 2-8. However, there was an increase in outage durations, as a result of the outage management processing issues within the new OMS, as shown in Table 2-4. These erroneous and long outage durations resulted in very high SAIDI outcomes. These long outage durations were also compounded by logistic delays and greater lead times in respect of procuring materials. JPS also experienced one (1) major tropical storm, Tropical Storm Ian, which contributed 2% to the annual SAIDI performance.

Outage Data Calibration Issues

The post implementation data challenges persisted up to the end of 2022. One noticeable observation is the increased SAIDI statistics. Closer scrutiny highlighted erroneous data due to integration issues with the various operational and enterprise systems, such as the Advanced Metering Infrastructure/Meter Data Management System. This affected the accurate registration of outage start times and end times. While good progress is being made in resolving emerging issues, there are still a number of lingering issues being resolved.

The OMS is a critical component of the utility's operations. It is used to manage power outages by tracking the location and extent of the outage, dispatching repair crews, and providing information to customers about the status of their service. However, due to the issues faced while using the OMS, it has had some severe implications for the utility's operations, for customers and for accurate performance reporting. These challenges are outlined below in *Table 2-4* and have resulted in:

- Missing outage information which is used for outage management.
- Extended outage response times due to inaccurate or incomplete datasets for crews to act upon.
- Misrepresentation of the actual quality of service experienced by the customer and by extension an imprecise reflection of JPS's performance under the Q Factor mechanism.

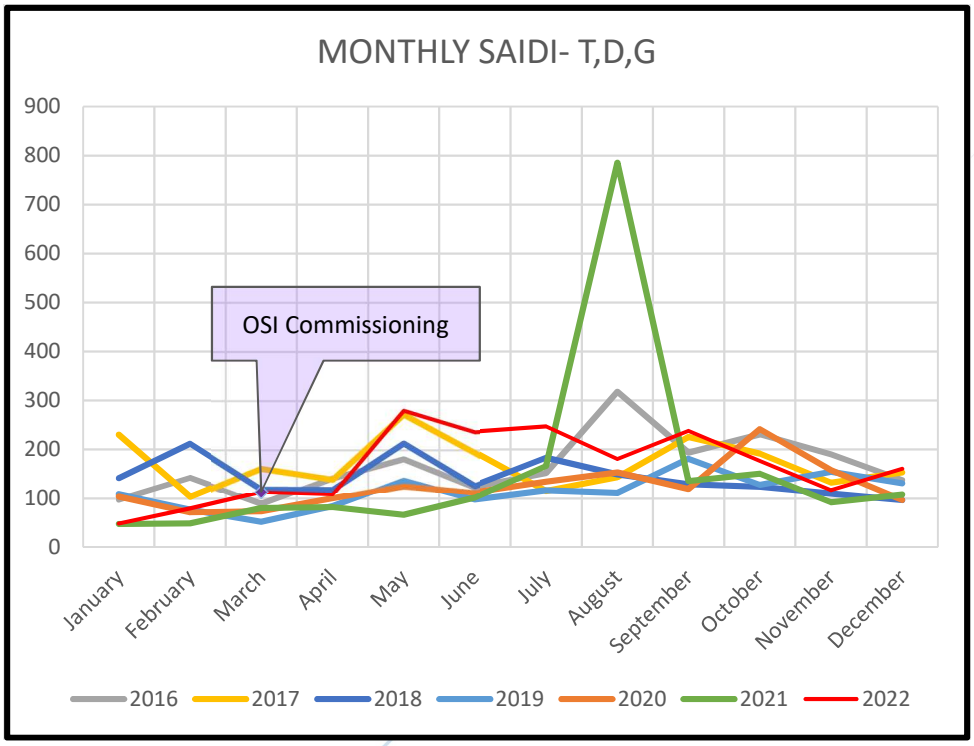
Table 2-4: OSI OMS Issues and Resolution in 2022

Issue	Effect	Resolution
Missing archived jobs from ODW Power BI dataset	It was identified that when jobs are archived or moved to an archived state they are no longer available in the ODW Power BI dataset. This was found when a record marked as archived in the OMS but was not available in the reporting dataset. The impact on performance for including these archived records is not known as yet.	There ongoing efforts to identify why these records in the OMS are not going over to the ODW when they are archived. This was resolved late January 2023.
Missing Cause Details	Incorrect classification of outages due to missing Cause detail. Outages that fall into NR (Non Reportable) Rule# 2 could be missed.	Work was done to address handover issues for orders being received from Clevest. Dispatchers were required to provide at a minimum the primary cause. In late 2022, the cause fields were redone to merge primary and secondary causes into a single field which is now mandatory for dispatchers. Through the use of PowerBI, scripting was done to auto assign secondary causes for specific primary-secondary pairings and for planned outages.
Archiving of SCADA operations managed through the DMS	Outages restored through the DMS were archived with compromised durations. Outages have the option of using the System Time or Field Time. Cases were present where records would be archived with start time using a very erroneous field time coming from the RTU out in the field and the system time as the finish. Producing excessive metrics. Field Time - time reported by the device based on last local operation. System Time - time reported by the device based on last remote operation.	The issue of System/Field Time was addressed in February 2023 with the Outage now defaulting to the System Time once available.
Initial State of OMS Model during Go Live.	Events were identified where the extent and duration of jobs was incorrect due to the state of non-communicating devices (K/S, D/O etc.) in the OMS not matching their real-world states.	Devices were progressively updated as they were operated on the OMS model day-to-day. Devices may still require validation but no quantified information to support this. Until individual case investigations are conducted then this can be considered resolved.
Field Time usage instead of System Time.	Records exist where the start times are reported before the commissioning of the OSI OMS (March 1, 2022). This caused records to be excluded from the initial investigative datasets. I.e. Jobs starting in 2019 - 2021 due to erroneous field time being used.	Outage steps for these jobs were adjusted according to System Time where available. If adjustments could not be made without conflicting outage steps or job errors then the specific step was excluded from the dataset.
Field Time usage instead of System Time.	The application of Field/System Times affects records by producing excessive durations for jobs. This can create scenarios where jobs span multiple days or months within 2022.	Duration would be adjusted based on System Time once no step conflicts are produced. If unable to adjust, the outage would be made non-reportable under the operator error rule.
Introduction of AMI Events to the OMS	The inclusion of events indicated by AMI notifications has increased the number of single customer outages thus increasing the number of Unknowns/Premises Found OK events. It has been seen that Dispatchers mark some of these as Non-Reportable, though there is no rule to govern it. These have to be investigated on a case level and be added to the verification process.	The option to revert QA jobs to a Cancelled state will allow for these to be handled and stored separately. This is being explored by the Grid Management Systems team.
Missing Operation Steps for events started in the DMS/SCADA.	For non-communicating devices (K/S, D/O), operations have to be replicated in the DMS differently than how SCADA devices do. If these operations are missing, then the metrics of the outage become compromised.	At present, no definitive resolution has been discovered for the stated issue.
Non-Creation of Outage Plans in the OMS	The OMS requires that Dispatchers create outage plans on devices on the OMS model before a planned outage. The planned outage would monitor and capture all related outage calls to that device and store them under the outage plan. If an outage plan was not created, the outage would be held as a forced outage with only the secondary cause being the means of indicating the planned outage. Outages that were not correctly flagged as planned, now require a post investigation to find the related outage request details and for the cause field to be adjusted.	In November 2022, a custom field was added to work around the need for outage plans. Once the dispatcher has put together the details of the outage and its calls, the planned work field allows him to flag an outage as planned. These still have to be validated via the SIRUS outage requests by the Reliability Team.
AMI Metering Issues	There are some false notifications being seen in the OMS caused by the AMI meters. The meter is pinged as offline, however customers have verified that no outage was seen. These non-outage events can't be classified as non-reportable under the current guidelines and impact performance negatively	Ongoing work has been done to eliminate these outages.

2.2.1 SAIDI Performance

Figure 2-1: SAIDI Performance in 2022 (include Generation, Transmission and Distribution), provides SAIDI reliability performance for 2022 broken out month by month against the baseline.

Figure 2-1: SAIDI Performance in 2022 (include Generation, Transmission and Distribution)

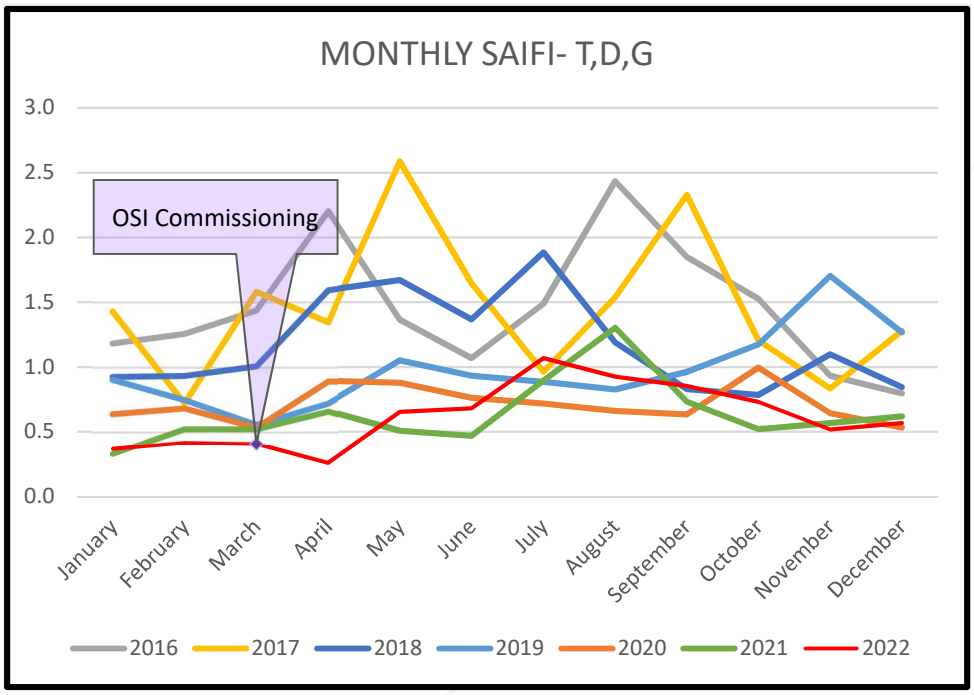


Since the commissioning of the OSI OMS, the SAIDI outcome has seen a significant increase comparative to the previous years. This was due to the impact of an influx of AMI events coming into the OMS which impacted outage response capabilities, hence the high SAIDI outcomes. There were also numerous high SAIDI events caused by erroneous long durations data from the integration of the operating system (SCADA, AMI etc.). Additionally, there were several long duration pre-archived data that was stored in the OMS, which prevented data validation and calibration. Notwithstanding, the 2022 SAIDI monthly performance was generally worse than the performance for 2016-2021, except for the Tropical Storms events in August 2021.

2.2.2 SAIFI Performance

Figure 2-2, provides SAIFI reliability performance for 2022 broken out month by month against the baseline.

Figure 2-2: SAIFI Performance in 2022 (include Generation, Transmission and Distribution)



Unlike the SAIDI performance, which was impacted by the numerous OSI outage management challenges, the SAIFI performance in ***Figure 2-2*** was generally better than the previous six (6) years, with a consistent trend of a higher frequency of outages during the hurricane season.

2.2.3 CAIDI Performance

CAIDI is derived from SAIDI and SAIFI indices. Figure 2-3, provides CAIDI reliability performance for 2022 broken out month by month against the baseline.

Figure 2-3: CAIDI Performance in 2022 (include Generation, Transmission and Distribution)

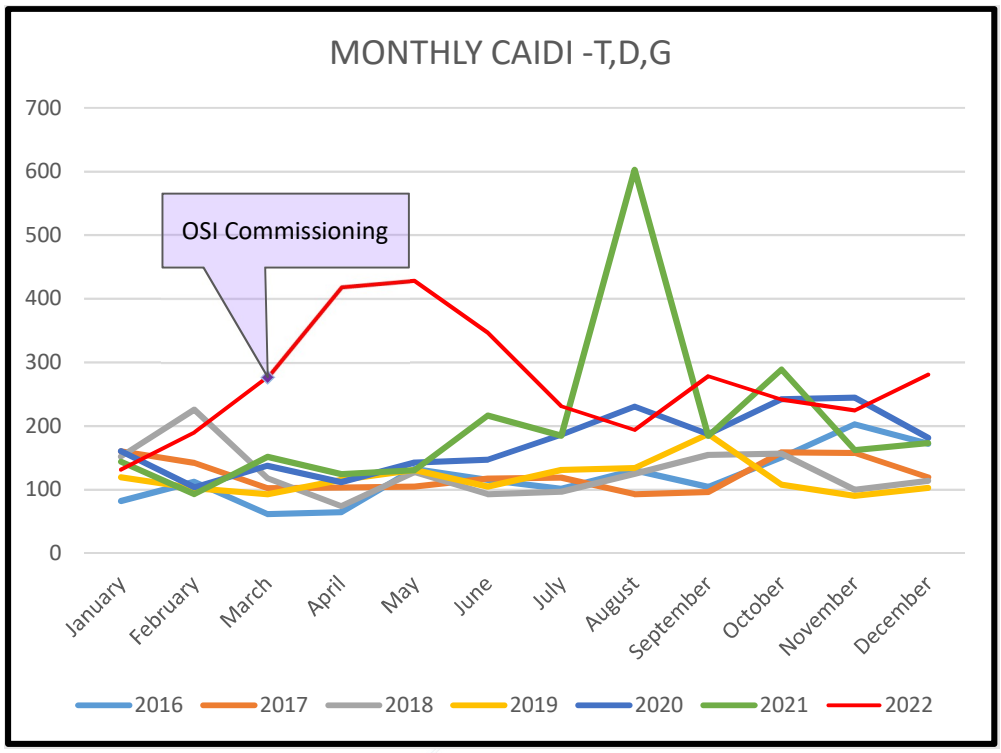


Figure 2-3 shows that the CAIDI performance was generally worse than the previous six (6) years. When compared with same months over previous years, the performance deteriorated drastically in the first and second quarter.

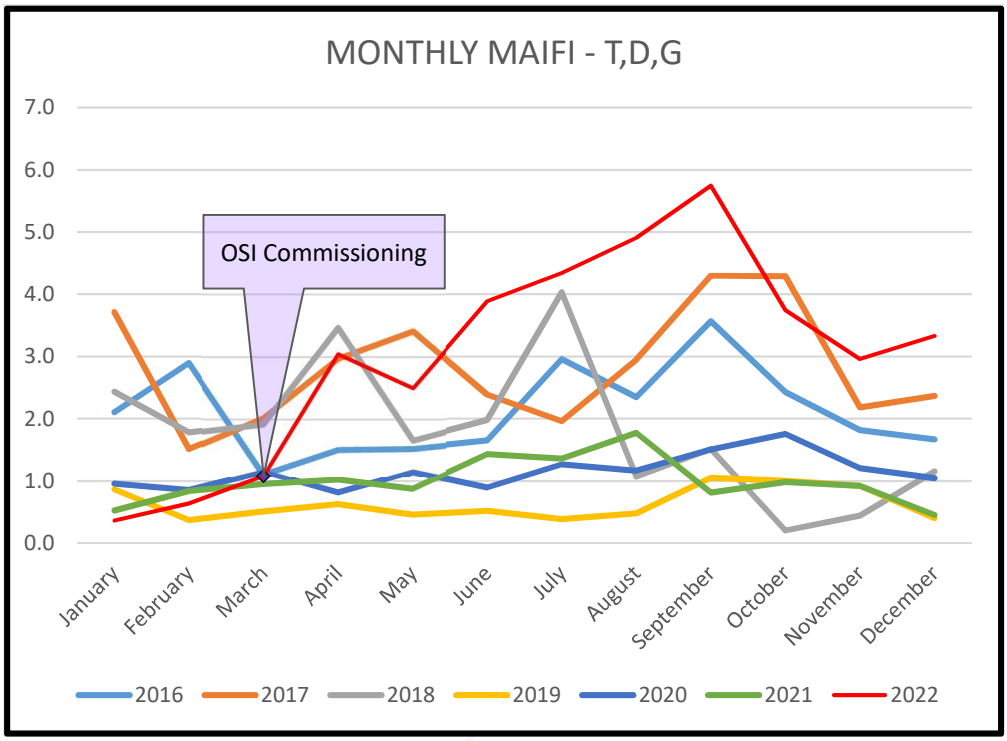
2.2.4 MAIFI Performance

Currently, momentary interruptions are captured at the feeder circuit breaker level. The Annual Outage Dataset includes these occurrences. This metric was developed in accordance with the calculations in the IEEE 1366-2012 Standards for reliability reporting.

MAIFI is included as a reliability performance indicator, as shown in *Table 2-2*. MAIFI, unlike SAIDI, SAIFI, and CAIDI, is not a part of the Q-Factor mechanism. Nevertheless, JPS is required to report momentary interruptions in order to facilitate ongoing system assessments based on regulatory reporting requirements. According to MAIFI data, average momentary interruptions per

customer increased significantly (204 percent) in 2022 compared to 2021, based on Table 2-2 indicating a worsened performance over the period.

Figure 2-4: MAIFI Performance in 2022 (include Generation, Transmission and Distribution)



There was a peak in MAIFI during September, primarily due to an increase in feeder cycling events associated with severe weather by Tropical Storm Ian. Although the largest cause contributor to MAIFI, was described as "unknown", the correlation lies with majority of the MAIFI contribution happening in the month of September (16% contribution). Corresponding to the usual adverse weather events associated with the hurricane season. Based on the transient nature of momentary faults it is difficult to ascertain the drivers/causes of these outages. By default, "Unknown" is used to classify these outages. The ability to ascertain drivers/causes of MAIFI increases if a momentary outage results in a "sustained outage", thereby, determining the cause from the work crews.

2.2.5 Q-Factor Adjustment

Exhibit 1 to Schedule 3 of the Licence sets out the calculation of a Q-factor adjustment based on cumulative quality points scores. If the sum of quality points for:

- SAIFI, SAIDI and CAIDI is 9, then Q= +0.50%
- SAIFI, SAIDI and CAIDI is 6, then Q= +0.40%
- SAIFI, SAIDI and CAIDI is 3, then Q= +0.25%
- SAIFI, SAIDI and CAIDI is 0, then Q= +0.00%

- SAIFI, SAIDI and CAIDI is -3, then Q= -0.25%
- SAIFI, SAIDI and CAIDI is -6, then Q= -0.40%
- SAIFI, SAIDI and CAIDI is -9, then Q= -0.50%

JPS' proposed Q-Factor adjustment for the 2022-2023 Annual review is summarized in *Table 2-5* below:

Table 2-5: Q-factor Adjustment for 2023 Performance

	SAIDI (min/customer)		SAIFI (interruptions/customer)		CAIDI (min/customer)		
	Variance	Quality Points	Variance	Quality Points	Variance	Quality Points	Total Quality Points
	-44%	-3	34%	3	-119%	-3	-3
Proposal	-	0	-	0	-	0	0

2.2.6 Non- Reportable Forced Outages

The implementation of the new OSI OMS has seen the emergence of a significant amount of non-reportable events. This again is due to erroneous outage data, which misrepresents the actual outages, caused by the various integrating systems. Though JPS has implemented various measures to reduce the extent of these Non-Reportable, a large percentage of these events were recorded prior to the Non-Reportable classification in the new OMS in December 2022. 2022 saw a **73%** increase in the number of Non-Reportable outages when compared to 2021 (8,304 outages in 2021 versus 14,365 outages in 2022), as shown in Table 2-6.

The new OSI OMS, had some inherent issues in its implementation which caused an increase in the number of Non-Reportable outages. A process for the daily outage validations checks was implemented by JPS. As a result, data calibration is performed as an integral part of JPS' reliability work processes, when the characteristics of outages are abnormal. The Rule-Based Data Dictionary, which was agreed upon by the OUR and JPS, is utilized as the guide in the classification of Non-Reportable outages. However, with the advent of the new OMS, some events can now be corrected, while others are being addressed over time. The Data Dictionary rules are as follows:

- Excessive customer count & OMS/GIS Glitches;
- Non-Utility related outages;
- Incorrect customer to device mapping; and
- Operator error.

From 2016 to 2022, JPS Non-Reportable outages averaged approximately 9.1%, as indicated in *Table 2-6* below:

Table 2-6: Non-Reportable Outages (2016-2021)

YEAR	Total Forced Outages	Non-Reportable Outages	% Non-Reportable of Total Outages
2016	70,034	5,431	7.8%
2017	81,478	5,436	6.7%
2018	57,944	3,040	5.2%
2019	49,243	4,854	9.9%
2020	56,405	2,942	5.2%
2021	61,828	8,304	13.4%
2022	91,065	14,365	15.8%
Average	**66,857**	**6,339**	**9.1%**

The 5% cap on the Non-Reportable outages was introduced by the OUR in the **2020 Tariff Adjustment Review.** Subsequently, JPS had been taking a number of steps to minimize the extent of these events in the old Ventyx OMS and currently in the new OSI OMS. While we were able to resolve a number of these non-reportable outages, through the enhanced features of the new OMS, other issues will be resolved over time. Some of the challenges we have observed are related to the OMS interfacing with other systems, while others are caused by the automatic processes within the OMS itself. With the integration of the OMS and the SCADA system, there are currently erroneous outages from the non-communicating devices which register the field time (last operating time) as the outage start time, this has led to exorbitant durations. There were also incidents due to the integration of the Work Force Management system where prolonged durations were caused by missing details that would assist with outage management. Additionally, issues due to the automatic processes within the OMS included instances where outages were automatically merged with another and based on the nature of the OSI OMS, it takes the start time of the earliest outage, that has also led to erroneous durations being recorded in the OMS even though the outage was restored. This would lead to an increase in Operator Error related outages.

Though the new OSI OMS was commissioned in March 2022, the configuration for the classification of "Non Reportable" outages by the operators was completed in December 2022. These events are flagged by the operators of the OMS as a routine part of the outage management process. This delayed classification feature resulted in only 32% of the total number of outages having an applied calibration rule. Overall, 68% of Non-Reportable outages remain unclassified for 2022.

Table 2-7 shows the breakdown of Non-Reportable outages by modality and the percentage contribution for the 32% classified outages:

Table 2-7: Breakdown of Non-Reportable forced outages

Year	Rule	Rule 1 – Excessive Customer Count	Rule 2 – Non-Utility Related Outage	Rule 3 – Incorrect Customer to Device Mapping	Rule 4 – Operator Error	Unclassified Non-Reportable Outages
2021	**# of Outages**	1220	2988	2503	1593	-
2022	**# of Outages**	727	2,141	598	1,067	9,832
2022	**% of Total Non-Reportable Outages**	5.1%	14.9%	4.2%	7.4%	68.4%

As illustrated in the table above the recorded main drivers for Non-Reportable outages are due to Non-Utility related outages which account for 14.9%, while Operator Error account for the second largest with 7.4%.

Initiative to reduce the number of Non-Reportable Forced Outages

The enhanced features of the new OSI OMS have significantly improved the accuracy of the customer's network connectivity through the improved GIS and OMS integration. While there are some lingering challenges, going forward it is expected to see a reduction in the number of Non-Reportable in all categories. Over time, JPS' ongoing review of the OSI OMS and its functionality and integration with other systems, will see us resolving a number of events, which would previously be classified as Non-Reportable.

Table 2-8: Forced Outages Reportable Type Contributors to SAIDI and SAIFI

Reportable Type	SAIDI(min/customer)	SAIFI(interruptions/customer)
Non-Reportable	1,374.21	2.78
Reportable	1,983.76	7.46

2.2.7 Outage Cause Analysis

As stated in item c) of Determination# 22, in each Annual Review application during the Rate Review period, JPS shall submit an outage cause analysis to support its Q-Factor Proposal. This was submitted as "Annex H – Outage Drivers 2022" in its submission. *Table 2-9* shows the reliability outage drivers and their respective contributions to SAIFI and SAIDI:

Table 2-9: Outage Driver Contribution to SAIFI and SAIDI

Primary Cause	% Contribution to SAIFI	% Contribution to SAIDI
Vegetation	27	16
Equip Failure	27	24
Unknown	15	24
Other	11	13
Lightning	8	7
Public Error	7	9
Power Supply	2	4
Wild Life	2	2
Contamination	2	1
Weather Conditions	0	0

Table 2-9 shows that Vegetation, Equipment Failure and Unknown were the main outage drivers for 2022. However, the improved response to vegetation related issues, when compared to the response to equipment failures, which were affected by material availability issues, resulted in a reduced Vegetation related SAIDI. Through the Integrated Vegetation Management programme JPS has and will continue to access and implement utility arborist guided approached on the worse performing targeted feeders.

JPS will continue to address equipment defects strategically on the T&D networks, targeting the worse performing feeders through JPS' routine detailed patrol, Network Inspection, and Structural Integrity Programs subject to OUR approved capital expenditure. JPS has taken steps to address the high number of outages caused by "Unknown" drivers by intensifying the utilization of various Diagnostic Tools to adequately investigate and diagnose the root cause of these outages, which are not easily identified during routine detailed and hazard patrols.

By pinpointing the root cause of outages, JPS aims to enhance reliability and reduce the number of "Unknown" related outages. JPS wants to emphasize that it is continually increasing its efforts to achieve this goal. Additional efforts being used to reduce "Unknown" outages are:

- To increase crew awareness and refresher troubleshooting training for work crews.
- Increased interrogation of the work crews by dispatch technicians to ascertain actual cause.

- Increased use of T&D diagnostic tools.
- Post outage inspection to ascertain actual cause and update in OMS

2022 Reliability Projects

The table below lists the Capital Investment Reliability projects that were approved in the 2019-2024 Rate Review Process. The completion status of the projects is outlined below:

Table 2-10: Project completion status for reliability projects

Reliability Impacting Projects	OUR Approved CAPEX (US$' 000)	Project Completion Status
Voltage Standardization Programme	$ 4,165	Programme scope deferred to 2023 due to material unavailability caused by global logistical challenges
Grid Modernization Programme	$ 2,915	Programme scope completed in Q1 2023
Distribution Structural Integrity	$ 4,763	2022 scope completed. Some activities were delayed during the year as several items of material are unavailable –Suppliers did not deliver as schedule (Longer procurement lead times are being experienced), however catch up was achieved by December 2022
Distribution Line Re-Conductoring and Relocation	$ 2,084	Most projects under programme were completed, with two reliability upgrade projects deferred to 2023 due to unavailability of material.
Transmission Structural Integrity	$ 1,858	Scope Completed
Substation Structural Integrity	$ 1,798	Project incomplete. Programme scope deferred for Equipment such as circuit breakers and reclosers to 2023 due to material unavailability caused by global logistical challenges.
Distribution Transformer Replacement/Upgrade Programme	$ 1,606	Both Parnassus and Spur Tree projects were completed and are fully operational in 2022.
Grand Total	**$ 19,189**	

Since the emergence of the COVID-19 pandemic, JPS has been facing logistics challenges, as with many electric utility industries across the globe. These challenges include tightening supply chains, unusually long lead times for critical assets, and shipping logistics delays, all of which have curtailed planned work activities. As a result, five projects were deferred until 2023 due to significant supply chain challenges. Nevertheless, JPS has made significant efforts through strategic planning and other initiatives to reduce the impact on its reliability objectives and the quality of service it provides to its valued customers. The Capital Investment Chapter provides further details on the scope and benefits of these projects, including the Distribution Structural Integrity, Distribution Line Re-Conducting and Relocation Programme, Voltage Standardization

Programme, Grid Modernization, and Substation Structural Integrity Programme. Routine maintenance, such as integrated vegetation management and other diagnostic activities, has also substantially aided in these reliability improvement projects.

2.3 Challenges in 2022

Logistics Delays

Ensuring the continuity of critical services is now an unprecedented challenge post a global pandemic. Some issues imposed on the utility are as follows:

- Shipping logistic delays, resulting in material shortage
- Scheduling delays due to material shortage

Reliability Baselines

In the commissioning of the OSI OMS, it was critical to consider the Reliability Indices (See Table 2-1) when establishing the company's baselines. However, using only the Reliability Baselines from the previous OMS to define the target for the current OSI OMS, is having negative implications.

Using the current Reliability Baselines which were established from the Ventyx OMS actuals might provide a historical insight on the company's performance. However, it can be concluded from the tending of the data, that there is a misalignment of the expected outcome from the old OMS versus the current OMS. Historical data can be used to detect trends and patterns in JPS' performance, however, the previous OMS reliability actuals are not an adequate reflection of the current status of JPS' infrastructure, which now takes into consideration different system interfacing. Thus, the current Baseline which is established solely on these outdated actuals sets the precedence for unrealistic and unattainable targets.

In conclusion, using the prior Ventyx OMS reliability indices to set targets for the current OSI OMS is having negative consequences. While it can provide historical context of the data, it can also lead to unrealistic targets, due to outdated metrics. Therefore, JPS is proposing that going forward the OSI OMS data should be used in the establishment of the reliability baselines.

Tropical Storms Ian

Tropical Storm Ian experienced on September 25th-26th, had an impact on JPS' electrical network resulting in numerous power outages across the island. The severity of weather conditions which resulted in flooding and landslides, hindering restoration efforts. These storms had a combined impact of 48.73 minutes and 0.11 times contributing 2% of SAIDI and 1% of SAIFI 2022 Performance.

Public Error – "Motor Vehicle Accident"

JPS has been closely monitoring the impact of outages due to "Motor Vehicle Accident" on the reliability performance. As at 2022, Motor Vehicle Accidents have contributed to 5% of the overall

reliability performance, resulting in corresponding SAIDI and SAIFI values of 90.6 minutes and 0.4 times. *Table 2-11* summarizes the Motor Vehicle Accident contribution to reliability performance:

Table 2-11: Vehicle Accident contribution for 2022 Reliability Performance

Year	Reportable SAIDI (min/customer)	Reportable SAIFI (interruptions/customer)	Number of Outages
2020	**73.4**	**0.5**	**1,595**
2021	**80.7**	**0.5**	**1,939**
2022	**90.6**	**0.4**	**1,595**

Customers experienced an increase in outage durations of 12% when compared to 2021 due to the above-mentioned secondary cause. Since these outages are outside of the control of the utility. JPS will seek to apply for exemption/exclusion, based on the provision in the Licence.

2.4 Reliability Performance Outlook for 2023 (Initiatives)

Consistent with the utility industry, JPS is going through a digital transformation to transform the way energy is delivered, thereby, enhancing operational performance and improving the customer experience. In the Jamaican energy landscape, ensuring a consistent supply of electricity is critical to ensuring the continuity of residential, commercial and industrial activities to enhance national growth and development. To achieve its strategic goals, JPS requires continuous and sustainable investments in the T&D infrastructure to deliver greater efficiency and service to its valued customers.

JPS is committed to enhancing its services to valued customers through various measures. These include investing in the T&D network, improving analytics capabilities, and enhancing customer communication. Additionally, JPS aims to provide more options and control to customers, and for this purpose, the company is focusing on developing its digital platform. The ultimate objective of these efforts is to enhance operational efficiency and improve the quality of service, while also making it easier for customers to conduct business with JPS.

Some of the over-arching objectives for 2023 are to:

- Improve outage reporting capabilities in the My JPS Mobile App for customers.
- Improve outage response capabilities through the introduction of the new OSI OMS
- Continue reduction of the frequency of outages through grid modernization
- Continue investment in the grid to improve its flexibility and transferability
- Implement quarterly objectives and key results to ensure improvement in initiatives
- Expand automated outage detection and reporting capabilities.
- Introduce innovative grid maintenance and improvement initiatives.
- Increase the use of JPS' digital Workforce Management System to optimize work crew efficiency for fast and convenient service
- Improve Project Management processes for the wide array of reliability CAPEX programs

- Empower customers to make the right decisions through the provision of energy usage data right on their mobile devices.
- Continue to use data analytics for continuous improvements in reliability, workforce efficiency and in resolving data quality issues.

Table 2-12 summarizes the capital investment for reliability projects JPS will be undertaking in 2023:

Table 2-12: Capital Investment for 2023 Reliability Projects

Reliability Projects	OUR Approved CAPEX ($US' 000)
Voltage Standardization Programme	4,547
Grid Modernization Programme	2,813
Distribution Structural Integrity Programme	4,822
Distribution Line Reconditioning and Relocation	2,405
Transmission Structural Integrity Programme	1,839
Substation Structural Integrity Programme	1,837
Grand Total	**18,263**

2.5 2019-2024 Rate Determination Request and Concerns

Major Events Days

In Paragraphs *15.112 of the 2019-2024 Rate Review Determination*, the OUR essentially states that JPS changed its position on the exclusion of MEDs. However, as outlined in section 7.4.3 of JPS' 2019-2024 Rate Review application, JPS adopts industry standards to allow for proper benchmarking, thus, while JPS observes the OUR's position, it still holds the view that the Institute of Electrical and Electronics Engineers (IEEE) standards should be applied.

In line with the aforementioned, JPS will have dialogue with the Ministry to establish a framework to properly adopt industry practices for uniformity in the computation of the reliability indices.

Major System Failures

According to Siemens Power Academy TD, some utilities have a 'storm' definition for major system events. This definition is typically characterized by the following:

- At least 10% of the customer base being interrupted.
- All customers being out of supply for at least 24 hours
- Damage exceeds design limits
- State of emergency declared

Under the *Electricity Act, 2015* ("the Act"), JPS adopts unavoidable Force Majeure and Major System Failure practices in accordance with industry standards. While these practices may adhere to utility-based definitions of storm events, the current definition of major system failures contained in the Act is far more restricted than industry standards. Section 45 of the Act defines a major system failure as a system failure that is not planned by the system operator, affects at least 1,000 customers, and lasts at least two hours. JPS believes that the standards currently in use by major North American utilities are the most appropriate and should be adopted.

Updates to the Data Calibration Dictionary

Rule 2 in the Data Calibration Dictionary states that for a reported outage where premise is locked and outage cannot be verified, Premises not found, Disconnect and Defective Customer Equipment should all be classified as Non-Reportable under these criteria. This occurrence should be flagged and logged but then changed to a Non-Outage call. JPS is therefore proposing a review of the current Rules Based Data Dictionary to capture these occurrences as Non-Outages, since the current rules were developed using the previous Ventyx OMS.

Due to the integration of the AMI metering with the OMS interface, there has been an influx of phantom calls, being seen in the OMS as customer outages. Without an established procedure in place for these new call logs, many of the AMI calls were classified as Non-Reportable, thus inflating the performance. Therefore, there needs to be a procedure in place for the treatment of 'Non-Outages' related to the AMI calls.

Dead Band

Based on the challenges with data quality and validation, there have been a significant increase in the 2022 performance, a 63% increase in SAIDI performance. This was due to the multiple problems faced with the interfacing of the OSI OMS with different systems. While there was an initial implementation period, there were challenges that persisted after the post implementation period. This has led JPS to conclude that the Q – Factor mechanism should be set at 0 quality points for the 2023 Adjustment Filing.

2.6 Conclusion

- JPS is proposing that the Baseline which was developed using the previous OMS data should be revised with considerations to the finding of the current OSI OMS.

- JPS has made significant improvements to its outage management capabilities through the introduction of the OSI OMS. However, the Company has faced challenges with data validation and quality assurance that have impacted the reliability indices. As a result, JPS is proposing that the Q-Factor outcome for the 2023 Tariff Adjustment Filing be set to zero (0) quality points due to these challenges.

- JPS is conducting an ongoing review of the new OMS, which may lead to revisions to the current Data Dictionary.

- JPS is seeking to establish a mechanism with OUR/MSET for the timely approval of Force Majeure applications, as provisioned in the Electricity Licence, 2016.

- JPS is requesting the exclusion of outages due to Motor Vehicle Accidents, which are out of the utilities' control.

- JPS is requesting the OUR to consider excluding Non-Reportable outages from the reliability Q-Factor calculations.

- JPS is requesting the OUR to reconsider the adoption of the 2.5beta methodology in the IEEE 1366 Standard, thereby excluding these events from the normal reliability performance. This is consistent with regulatory utility practice.

- JPS is requesting the OUR to establish the CAIDI target based on JPS's ability/capacity to respond to outages, rather than it being derived from the ratio of SAIDI and SAIFI.

- Finally, JPS proposes that the definition of "Major System Failure" should align with international utility best practices.

- By implementing these measures, JPS aims to improve its reliability indices and ensure it provides quality service to its valued customers.

3. 2023 Annual Revenue Target

Exhibit 1 of the Electricity Licence provides that the Annual Revenue Target is to be calculated using the formula:

$$ART_y = RC_y(1 + dPCI) + (RS_{y-1} + SFX_{y-1} - SIC_{y-1}) \times (1 + WACC)$$

The approved pre-tax WACC is 11.87% as stated in Determination #11 of the 2019-2024 Rate Review Determination.

The 2023 Annual Revenue Target is J$55B when the formula above and the inputs discussed in Chapter 1 was applied and is depicted in *Table 3-1* below. This translates to an average non-fuel tariff impact of 13.15% as detailed in Chapter 7 (Tariff Design).

Table 3-1: 2023 Annual Revenue Target Calculation

2023 Annual Revenue Target (J$M)		
Description	**Formula**	**Value**
Approved Revenue Cap	RC2023	38,783
Annual Rate of Change	dPCI	39.54%
Adjusted Revenue Cap	RC2023 * (1 + dPCI)	54,116
Revenue Surcharge	RS2022	(166)
FX Surcharge	SFX2022	893
Interest Surcharge	-SIC2022	138
WACC		11.87%
2022 Adjustments	(RS2022 + SFX2022 - SIC2022) * (1 + WACC)	968
2023 Annual Revenue Target	**ART2023**	**55,084**

Noteworthy, the 2023 ART in *Table 3-1: 2023 Annual Revenue Target Calculation* reflects the exclusion of a Z-Factor and Q-Factor Adjustment.

4. Capital Plan Adjustment

4.1 Introduction

The 2019-2024 Rate Review application was the first filing proposing a five-year revenue requirement on a forward-looking basis. This filing included approving JPS capital investment plan on a forecast basis, which is subject to Z-Factor adjustment in accordance with paragraph 46(d) of the Licence and Criterion 13 of the Final Criteria. The 2022 review is the third Z-factor adjustment review to be conducted for JPS capital investment performance during the 2019-2024 Rate Review period.

Determination #3 of the 2019-2024 Rate Review Determination categorized JPS's capital investment projects as follows:

- Major Projects;
- Extraordinary Maintenance Projects; and
- Minor Projects.

Paragraph 5.30 of the 2019-2024 Rate Review Determination notes that consistent with the Final Criteria, the variations in capital investment projects that trigger the Z-Factor adjustment are categorized and deemed to be as follows:

Project Delays

The delays in a Major or Extraordinary Maintenance Project(s) can trigger the Z-Factor adjustment if there is at least a 5% variation in the annual expenditure for each project in the prior year. Similarly, if the same variation occurs in the annual expenditure for Minor Projects as a whole, there will be a corresponding Z-Factor adjustment.

Unimplemented Projects

For the removal of projects that should be implemented within a given Rate Review period, JPS should provide justification for this action. If the justification is deemed reasonable by the OUR, the Z-Factor adjustment will be utilized to remove the expenditure which was associated with that project from the Revenue Requirement.

Unplanned Projects

Where a need arises for a project categorized as either a Major or Extraordinary Maintenance Project, and this project was not included in the approved Business Plan, it will be classified as an unplanned project. Unplanned projects require a justification from JPS and should be approved by the OUR prior to implementation. Where the project will result in an increase in the capital expenditure for that year by at least 10%, a Z-Factor adjustment will be applied.

Changes in Project Scope

A change in the scope of a Major or Extraordinary Maintenance Project will require the prior approval of the OUR. In a given year, if the change in the scope of either of these types of projects

results in a reduction in the project cost by at least 10% of the projected capital expenditure, a Z-Factor adjustment will be applied that will result in 50% of the savings being passed on to customers for the remainder of the Rate Review period.

The 2019-2024 Rate Review Determination approved JPS's investment of US$88.7M in 2022 on 51 Capital Projects/Programs. Of these 51 Projects/Programs, eleven (11) were classified as Major or Extra-Ordinary Projects, while forty (40) were classified as Minor Projects. In addition to the approved projects in the 2019-2024 Rate Review Determination, JPS undertook two projects not submitted in the current medium-term investment plan. The 40 MVARS Bulk Capacitor Banks and GT10 Major Overhaul were implemented in 2022, as both projects became necessary after the retirement of the B6 generation unit at Hunts Bay. These projects will provide grid stability and alleviate the need for a non-economic dispatch due to generation shortfall in the corporate area. The OUR approved implementing these projects in the 2022 annual determination dated August 2022. JPS is now applying for the incremental revenue requirement associated with these two projects in this filing.

For 2022, JPS spent US$85.1M on the projects approved by the OUR; US$52.9M was spent on Major and Extra Ordinary Maintenance Projects, and US$32.2M was spent on Minor Projects.

In the category of Major and Extra-Ordinary Maintenance Projects, nine (9) projects were fully completed, and one (1) was delayed due to difficulties in procuring key inputs due to the disruptions in the global supply chain. The other has been put on hold based on the impact of inflation on inputs that resulted during the procurement phase of the project. The net unspent budget in the major category of projects is 11%, as there was overspend on eight (8) projects that helped to offset the reduction from the two deferred projects.

In the category of Minor Projects, forty (40) projects were attempted; twenty-two (22) projects were completed; thirteen (13) projects were partially completed, and five (5) projects have been delayed and will be completed in 2023. The total overspend in this category of projects is 7%, where JPS overspent the 2022 approved budget on fourteen (14) projects.

4.2 Capital Projects Performance for 2022

The Final Criteria (Paragraph 7.1.5) outlines that JPS provides adequate information in its Annual Review so that the OUR can accurately assess the capital expenditure, the degree of project implementation, and the cost, time, and design deviations from the original plan. In the individual updates on Major and extra maintenance projects. JPS will enable the regulator to understand any material cost, time, and scope deviations.

The Major projects approved in the 2019-2024 Rate Review Determination to be reviewed for 2022 are as outlined below:

- Smart Meter Program
- Old Harbour – Hunts Bay 138 kV Line
- Voltage Standardization Program
- RAMI Program
- Grid Modernization Program

- Critical Spares – Generation
- Distribution Line Structural Integrity
- Customer Growth (CCMA)
- Combine Cycle Plant
- Smart LED Streetlight Program
- Meters & Service Wires

Minor Projects will be reviewed collectively in keeping with the framework established in the Final Criteria.

Smart Meter Program

The OUR approved budget of US$12.5M was programmed to support installation of 65,500 Residential and Commercial smart meters and 3,500 transformer meters in St. Ann and Westmoreland. The project utilized US$12.7M in 2022, 2% overspend; this facilitated procurement and installation of 65,590 Residential and Commercial meters and 4,398 Transformer meters in St. Ann and KSAS. The project location was adjusted to manage manual meter reading risks that arose in KSAS and demanded JPS to respond by converting the area to smart meters. There was a two-month delay in project execution due to the shortage of 2s Meters, however, in Q4 2022, JPS was able to ramp up installations to complete the scope following the receipt of the shipment of meters. Due to the project delay, the installation of the Communication network to backhaul the AMI data was completed at the end of January 2023.

Old Harbour – Hunts Bay 138 kV Line

This project represents the most significant variation from the plan. The project had an approved budget of US$10.8M. The plan was to advance easement and engage EPC contractors in constructing the new 40 km transmission line from Old Harbour and the new substation at Hunts Bay. JPS only invested US$0.1M in 2022, which supported easement activities. JPS, after an extensive procurement process, found proposals to be significantly more expensive than the approved budget. The main reason cited by bidders was inflation in the cost of inputs. As a result, the project was put on hold by the OUR in the August 2022 annual determination. JPS has commenced a review of the project to include, alternative analysis, review of the outcome of the new IRP and revised cost estimates; JPS will engage the OUR in a consultative manner by October 2023, when the company will have more clarity on current costing, to finalize the way forward for this project.

Voltage Standardization Program:

The 2022 Voltage Standardization Program (VSP) was approved by the OUR for US$4.1M to (1) reinstall the remaining 57km of the distribution network (Between Highgate and Annotto Bay Substation), (2) construct 17.3km of tie line between Blackstonedge SS and Michelton Halt SS, and (3) reinsulate and convert Michelton Halt Substation and 2 distribution feeders. However, the expenditure for 2022 was US$0.4M, which was used to complete 10% re-insulation on the 57km of the distribution network.

The project faced difficulties procuring key inputs such as conductors, insulators, poles, and transformers due to disruptions in the global supply chain. As a result, the 2022 scope was differed to 2023.

RAMI Program

The 2022 Rami Program had an approved budget of US$3.0M to upgrade metering infrastructure in Three (3) communities to make them theft-resistant (Granville, August Town Phase 2, Tower Hill). JPS spent US$3.5M, which resulted in the completion of the three (3) carry-over projects from 2021 (Steer Town, Grants Pen Phase 1, Lilliput) that were delayed due to supply chain issues as well as the 2022 approved projects. Construction activities were completed in all six project areas in December 2022, with cut over activities in Tower Hill completed in Q1 2023. The program lead to the addition of 1352 new customers at the end of 2022 with an expected of a further 1550 by June 2023.

Grid Modernization Program

The Grid Modernization Program was approved to spend US$2.4M in 2022 to install 320 - 24 kV@100 A Trip Savers, 30 Distribution Automation Sectionalizes (DA Switches), 5 Pole Mounted Reclosers, and 90 Fault Circuit Indicators across the distribution network. By the end of 2022, 320 Trip Savers, 90 Fault Circuit indicators, 5 pole Mounted Reclosers, and 30 DA Switches were installed at the cost of US$2.4M. Commissioning of the installed devices was completed at the end of Q1 2023.

The intended benefit of the 2022 project is 44 minutes' reduction in SAIDI and a 7.5 MWH reduction in unserved energy (annualized). For the periods February 2023 to March 2023 JPS has measured 4.7 minutes of SAIDI savings in the areas where the installations were done. JPS expects this to grow to 52 minutes by the end of 2023.

Critical Spares-Generation

The program to replace critical capital spare parts at power plants was approved to spend US$3.1M in 2022; JPS spent US$3.4M on the program during the budgeted year. JPS managed the availability of the generation fleet by replacing only spare parts deemed to be near the point of failure; this helped to contain expenditure on this program while maintaining planned fleet availability. Critical Spares were maintained as recommended by the Plant's Operations & Maintenance Team at Bogue, Hunts Bay, Rockfort, and Renewables, guided by OEM / Plant recommendations. The Bogue Plant ended 2022 with a 91% availability and a 6% equivalent forced outage rate. Rockfort Plant ended 2022 with an 83% availability and 8% equivalent forced outage rate. Hunts Bay Plant ended 2022 with an 87% availability and 22% equivalent forced outage rate. Renewables ended 2022 with a 77% availability and 15% equivalent forced outage rate.

Distribution Line Structural Integrity

The distribution Structural Integrity Program was approved at a spend of US$4.76M in 2022; JPS spent US$5.57M on the program for the year. The 2022-planned scope was to replace 1,964 distribution poles at an advanced stage of deterioration and rehabilitate 3,801 poles that were in less advanced stages of decay. The program also sought to replace ~ 12,700 pieces of equipment (cross-arms, insulators, etc.). At the end of 2022, JPS replaced 4,109 degraded distribution poles, rehabilitated 4,476 poles, and replaced 9,118 pieces of equipment.

This represents an overspend of US$0.44M or 9% for 2022. In 2023 JPS intends to reduce the approved budget by the equivalent amount to ensure the overall envelope is not increased. Additional work to strengthen distribution structures in 2022 was required as patrols revealed significant structural integrity deficiencies. Additionally, persistent bad weather resulting in flooding, lightning strikes, and landslides across several parishes drove the need for emergency replacement of distribution structures. As a result of the foregoing, there were broken poles and other structures that JPS needed to replace to ensure customers were reconnected promptly after forced outages. This program shielded customers from the negative effects of extended outages resulting in excessive unserved energy conditions.

Customer Growth (CCMA)

The Customer Growth or complex connection program (CCMA) was approved to spend US$6.8M in 2022, but JPS spent US$6.7M on the program resulting in a -2% underspend. The CCMA program is used to construct infrastructure to enable complex connections to the distribution network and is done at customers' request. Condition 13 of the Licence obligates JPS to connect customers under specified conditions and this program allows JPS to fulfill its mandate under the Licence.

In 2022 JPS actioned four hundred and forty-nine (449) requests for complex connections, with two hundred and three (203) completed in 2022 and the others carried over to 2023. Based on aggregated transformer capacity, JPS estimates ~28,293KVA of new capacity was added through these 203 completed projects in 2022.There continue to be increased connection requests, particularly in the KSA corporate Areas, North Coast, Manchester, and St Catherine. 23% of the requests for new connections have come from Kingston and St Andrew. Request for connections was mainly related to expanding the small commercial (fast food restaurants and offices) and the housing sectors, with apartment complexes and sub-divisions being the main drivers. This program is critical to growing (sales) electricity demand and helping reduce the average tariff.

Combine Cycle Plant

The Combined Cycle plant was approved to spend US$8.8M to conduct a major overhaul of the Bogue Steam Turbine unit and upgrade and overhaul other components related to the unit. To complete the overhauls and upgrade, US$10.05M was spent, resulting in the following benefits:

- Unit achieved an increase in output of 2.2MW on average and a 300kJ/kWh improvement.
- Improve Steam Turbine output by 2 MW.

- Improve the Asset Health Index of the Unit and sustain reliable operation for another (5-7 years).
- Provides continual Combined Cycle operation of 116 MW-base load power to the National grid on the western side of the island

The project experienced a longer than planned outage window which also lead to the increase in project cost. This is due to greater than projected deterioration in seals which was discovered after the plant was brought offline.

Smart LED Streetlight Program

US$2.8M was spent on this multiyear program to complete the target of replacing all HPS streetlights in Jamaica with Smart LED streetlights. The 2022 plan sough to convert an additional 5,773 HPS streetlights to LED. Due to continued disruptions to global supply chains of semiconductors, the delivery of smart controllers to JPS was delayed. All targeted HPS streetlights were converted to LED in the period. Smart controllers were received late in 2022 and retrofitting of LED lights with these controllers was completed in Q1 2023. The LED streetlight program reduces the amount of electricity consumed by a streetlight by ~50% as it is converted from HPS to LED. This significantly reduces the energy bill on street lighting and creates opportunity to better illuminate Jamaica's dark spots. JPS will engage the OUR by July 2023 to consult on an expansion of program so as to better serve customers through additional lighting.

Meters & Service Wires

The meters and service wires project was approved to spend US$2.8M in 2022; the program saw investment of US$5.6M or 99% more than planned, resulting from increased customer demand for connections. The program enabled the installation and replacement of over 45,204 customer meters and build out of 478 km of service wires across all 14 parishes, note that the budget approved by the OUR was aligned to the installation of approximately 13,000 meters for 2022. This program is also mandated by Condition 13 of the Licence, which requires JPS to connect all customers seeking to connect to the distribution grid. If these meters are not replaced, JPS will be forced to estimate customer's monthly consumption. JPS faces a guaranteed standard penalty if it provides customers with multiple estimated bills. This is an area of significant risk for JPS as the demand for meter installations is outpacing the OUR approved budget.

Minor Projects

The Final Criteria defines Minor Projects as non-routine capital projects valued at less than US$10M. Each Minor Project shall be clearly identified in JPS' capital investment plan but shall be assessed for Z-Factor adjustments collectively (i.e., based on the performance of all projects in the Minor Project category as a whole).

The Minor Projects category, as outlined in Table 2 of the Appendix, collectively has a 7% overspend of the approved budget The approved budget for 2022 was US$29.4M, and a total spend by JPS of US$32.2 M. Of the forty (40) projects approved in this category, twenty-one (22) were completed as planned, with thirteen (13) partially completed and five (5) delayed.

The continued supply chain fallout from the global pandemic and the emergent war between Ukraine and Russia have made the operating environment hostile, resulting in delays in project execution. These realities are the main drivers for deviations from the plan.

4.3 Proposed Treatment of Variances

JPS continues to challenge the approach outlined in the final criteria that Major projects should be evaluated individually for Z-Factor adjustment. This matter is currently under appeal as Paragraph 46(d)(iii) provides for the assessment of variances on the aggregate annual capex. JPS requests that the OUR not implement a Z-Factor adjustment on major projects using this methodology as it is the subject of ongoing legal appeal.

JPS proposes that *no Z-Factor adjustment* be implemented for the value associated with the implementation of the Old Habour-Hunts's Bay 138kv transmission Line and the Voltage Standardization Program.

There is an underspend on the 138kV line project; the project has been put on hold by the OUR due to the inflation on key inputs recognized during the procurement process. JPS continues to evaluate alternatives, while monitoring the developments with the draft IRP before making an updated proposal to the OUR. JPS will re-engage vendors in 2023 with the aim of arriving at new costing for the original project as well as alternatives. These results will be shared with the OUR by October 2023.

JPS also proposes implementing no Z-Factor adjustment for the Voltage Standardization Program. The project faced difficulties procuring key inputs such as conductors, insulators, poles, and transformers due to disruptions in the global supply chain that continued into 2022. As a result, the 2022 scope was differed to 2023. The remaining feeders are now in the construction phase.

For projects that experienced overspend in 2022, we propose that JPS be allowed to offset the under expenditure with this overspend. The result of this would be a 4% variance as the 2022 actual expenditure was US$85.1M vs approved Budget of US$88.7M. JPS holds that this annualized approach is aligned Paragraph 46 (d)(iii) of Schedule 3 of the Licence and provides the optimal outcome for customers and the utility.

JPS has not cancelled the implementation of any approved 2022 project and does not intend to delay any projects beyond the 2023 regulatory window, except for the 138KV transmission line project which is slated for completion in 2025; subject to the requirements of the published IRP. The approved project scopes not executed in 2022 face a timing variance due to the factors outlined in this chapter. For some projects, JPS has entered into contractual commitments for the supply of inputs and services to be delivered in 2023. JPS intends to fully catch up with delayed investments by the end of 2023 so that proposed benefits will be delivered for customers.

4.4 Request for Revenue Uplift

JPS will delay the request for revenue adjustment on projects that received approval as Extra Ordinary Projects arising from system risks not identified prior to submitting the 2019-2023 investment plan.

The 40 MVARS Bulk Capacitor Banks, GT10 Major Overhaul, Rockfort Plant Overhauls, Bogue Gas Turbines, Critical Spares and North East Coast Voltage Enhancement projects were approved by the office in response to Extra-ordinary request made by JPS in 2022; however as outlined by the OUR in section 12.13, point 7 of the 2022 JPS annual review determination; the revenue adjustment is to be carried out in the 2023 Annual review. JPS is willing to forego this uplift until the 2024 annual review.

4.5 Capital Projects Performance Outlook for 2023

In 2023, JPS intends to execute the projects approved in the 2019-2024 Rate Review Determination for 2023 implementation and the projects and scope deferred from 2022. Where there was overspending on projects in 2022, this will be offset against the 2023 approved amounts. Therefore, by the end of 2023, the approved expenditure for 2022 and 2023 will be expensed, and the planned project activities will be completed. This assumes global supply chains return to normal. Note however that the projects linked to customer demand, Meters and Service Wires and Customer growth (CCMA) may continue to outpace the approved OUR budgets if demand continues at the same pace as the past year.

2023 will see JPS carry out fifty-one (51) approved projects; eleven (11) of these projects are in the Major and Extra-Ordinary Maintenance category, while forty (40) are minor projects.

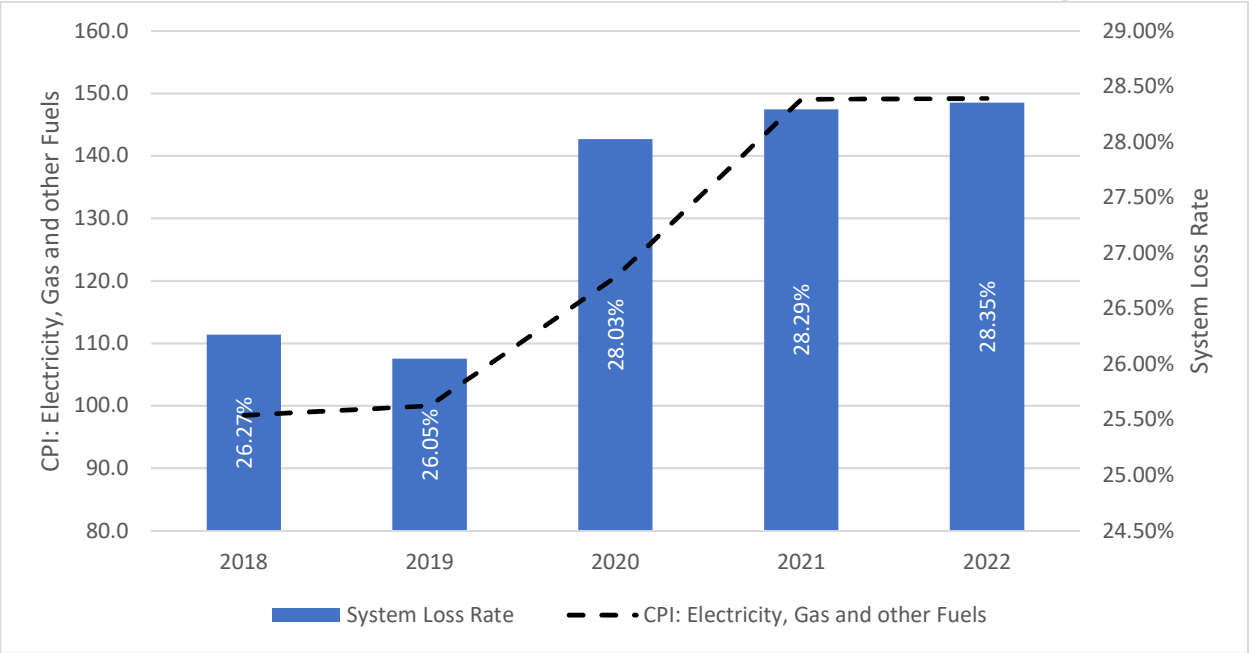
Table 3 in Appendix F illustrates the budget by project for 2023, including the carry-over amounts deferred from 2022. This shows that at the end of 2023, JPS will expend all funding approved for 2022 and 2023 that it remains prudent to invest.

5. System Losses Performance Review

5.1 System Losses Performance for 2022

Despite the initiatives executed and the investment by JPS, system losses trended upward in 2022 to 28.35% compared to 28.29% in 2021. Based on the overall performance, this increase does not appear to be as drastic as has occurred in prior years. Figure Figure 5-1 below shows the system losses over the past five years (2018 – 2022).

Figure 5-1: System loss rates and CPI for Electricity, Gas, and other Fuels for the calendar years 2018 - 2022



The recent trend in system losses coincides with the recovery of the economy from the exogenous shocks of the pandemic. The total value added by industry, a method of estimating GDP, was 1.7% less in 2022 compared to 2019, for the first three quarters of each year. This is an improvement from the first three quarters in 2020, which was 10.5% less than the same period in 2019. The cost of electricity, gas and other fuels has also stabilised in 2022 increasing by only 0.1% according to data published by the Statistical Institute of Jamaica (STATIN). In our previous filings, we have discussed the factors that influence each person's choice between legitimate and illegal supply. Economic conditions such as income levels, and the cost of living were identified as a major driver of electricity theft and the data is consistent with our position.

The table below shows the breakdown of system losses into technical and non-technical losses for the calendar years 2021 and 2022.

Table 5-1: Technical and non-technical loss rate for 2021 and 2022

	2021 Rate	2022 Rate
Technical Loss	7.91%	7.77%
Non-technical Loss	20.38%	20.59%
System Loss	28.29%	28.35%

In terms of energy, *Table 5-2* below shows that technical losses increased by 0.93% compared to 3.83% for non-technical losses. Net generation increased by 2.81%, which explains why the loss rate did not change significantly.

Table 5-2: Annual change in technical and non-technical energy loss

	2021 Energy (MWh)	2022 Energy (MWH)	Change
Technical Loss	340,485	343,666	0.93%
Non-technical Loss	877,282	910,908	3.83%
System Loss	1,217,767	1,254,573	3.02%

5.1.1 Technical Loss Initiatives

In its 2019 application and subsequent reviews, JPS outlined several initiatives for 2019 - 2024 designed to improve system losses. There were three technical loss-reducing initiatives planned to derive benefits in 2022 as shown below:

Table 5-3: Summary of planned vs actual technical loss reduction initiatives for 2022

Initiative/Activity	Planned Loss Reduction (MWh)	Actual Loss Reduction (MWh)
Voltage Standardisation	2,595	-
Distributed Generation	600	545
Capacitor Bank	603	-
Totals	3,798	545

JPS continues to make strides in the reduction of technical losses with major initiatives taking place on both the transmission and distribution network. These include the continued execution of the Voltage Standardization Program (VSP), the new 10 MW CB Hill Run Distributed Generation Project and the Corporate Area Capacitor Bank Project.

Voltage Standardisation

JPS planned to upgrade the New Michelton Halt 210 and 310 feeders in St. Catherine from 12 kV to the standard 24 kV in 2022. However, supply chain disruptions affected the delivery of key materials needed support all aspects of the business. JPS took a strategic decision to delay the implementation of the VSP program to ensure smooth supply of materials to other critical areas of the business. The program will continue in the 2023 calendar year with a total spend of US$ 9.2M. The project will encompass the original scope of the two feeders at Michelton Halt plus additional feeders including Rhodens Pen 210, 310 and 410 to give a total of five (5) feeders to be upgraded.

Distributed Generation

JPS collaborated with Caribbean Broilers (CB) and New Fortress Energy to commission a 10 MW power plant to supply CB properties in Hill Run, St Catherine. The 10 MW project, the first of its kind in Jamaica, has been commissioned and is providing 10 MW peak of generation to the distribution network. For the 2022 calendar year, a reduction of 545 MWh of technical losses were realized with the implementation of the CB Hill Run distributed generation plant.

Corporate Area Capacitor Banks

Capacitor banks are an effective means to inject reactive power nearer to loads than the conventional transmission of reactive power over lengthy power lines from the generating units to the load centres. JPS has embarked to install and commission a total of 40 MVAR of substation capacitor banks; 30 MVAR of new capacitor banks and the rehabilitation of 10 MVAR of existing containerized capacitor banks in an effort to reduce technical losses on the transmission network. The 30 MVAR of new capacitor banks consist of six (6) installations while the 10 MVAR of rehabilitated capacitor banks consist of two (2) installations to give a total of eight (8) units totalling 40 MVAR to be commissioned. The six (6) new installations will be at the Hunt's Bay, Rockfort, Three Miles, Greenwich Road, Washington Boulevard and Hope substations while the two (2) rehabilitated installations will be at the Constant Spring and Washington Boulevard substations. Each of the capacitor banks are rated at 5.0 MVAR.

JPS faced significant delays in the delivery of key capacitor bank components due to supply chain challenges and as a result, no capacitor banks were commissioned for the 2022 calendar year. The capacitor banks have steadily been commissioned starting in January 2023 and benefits expected are 603 MWh in annual transmission technical loss reduction.

5.1.2 Non-Technical Loss Initiatives

Table 5-4 below shows the summary of the loss benefits for the non-technical loss initiatives planned for 2022.

Table 5-4: Summary of planned vs actual non-technical loss reduction initiatives for 2022

Initiative	Planned Loss Reduction (MWh)	Actual Loss Reduction (MWh)
RAMI Projects	14,000	15,353
Audits (Smart Meters)	17,000	6,588
Community Renewal & Strike Force	18,000	5,749
Total	49,000	27,690

Smart Meter Audits

The global supply constraints severely affected JPS' ability to secure enough meters to meet the demand for new installations and the smart meter project. This resulted in long lead times and lower than expected meter stock levels. The decision was made to prioritise having meters available for new installations, and maintenance activities. As a result, the 2022 smart meter project started late, took longer than expected, and had fewer installations than planned at 41,487 revenue meters installed compared to 65,500 planned. The shortage of meters also affected the plan to expand the energy balance, which was paused, as revenue meters were prioritised over transformer metering.

Meter reading for non-AMI meters was disrupted due to issues with our third party contractor, which resulted in an increase in estimated bills for our customers in specific areas. Smart meters that were earmarked for the Westmoreland project area were used instead to change out non-AMI meters for our most affected customers. The diverted meters are not expected to yield a loss reduction benefit but have already caused a reduction in estimated bills sent to customers. A number of technician teams that perform investigations were diverted to assist in manual meter readings for several months to help contain the impact of the meter reading issues. The collective impact of this was fewer audits than planned. Despite these strain on our audit resources JPS managed to complete over 90% of the 75,000 planned audits, which yielded a recovery of seven (7) GWh.

The plan for 2023 is to perform 90,000 audits and install 80,000 smart meters supported by additional safeguards to secure the 2023 delivery schedule. The 80,000 meters includes approximately 24,000 meters that was scheduled for installation in 2022. The expected benefit of this is 29 GWh.

Residential Automated Metering Infrastructure

The expected benefit of the six project areas completed in 2021 was 14 GWh in 2022; the actual benefit was about 15 GWh. There were six project areas planned for completion in 2022, with benefits expected in 2023. All projects were completed in 2022, however, longer than expected lead times on pole line materials and, to a lesser extent, RAMI meters were the main factors that caused the delayed completion of the projects.

Table 5-5: Expected benefits from 2022 project areas to be realised in 2023

Project Area	Pre-Project Loss Rate	Current Loss Rate	Annualised Loss Reduction (MWh)	Completion Date
Tower Hill	76%	56%	845	Dec 2022
Steer Town	69%	16%	4,406	Oct 2022
Grants Pen Phase 1	61%	28%	2,642	Oct 2022
August Town Phase 2	72%	28%	1,444	Dec 2022
Granville	78%	32%	1,001	Dec 2022
Lilliput	65%	28%	882	Oct 2022

While the projects are complete, connections are ongoing for Lilliput and Tower Hill. The table below shows a summary of the project areas planned for completion in 2023 with benefits to be realised in 2024.

Table 5-6: Expected benefits from 2023 RAMI project areas to be realised in 2024

Project Area	Current Loss Rate	Expected Monthly Loss Reduction (MWh)
August Town Phase 3	78%	142
Grants Pen Phase 2	72%	165
Leith Hall	93%	260
Total	82%	567

In addition to the project areas JPS has begun a multiyear initiative to upgrade aging RAMI platforms. Our customers have experienced a higher than normal incidence of estimated bills due to the aging infrastructure and the lack of support from the meter OEMs. Additional details of this initiative are provided in a separate report.

Community Renewal and Strike Force

The table below shows a summary of expected and actual benefits of our ambitious social reform programmes.

Table 5-7: Expected and Actual Benefits from Social Reform Programmes

Initiative	Expected Regularisations	Actual Regularisations	Expected MWh Loss Reduction	Actual MWh Loss Reduction
Ambassador	1,700	1,331	1,680	3,078
Spin to Win	3,000	1,843	3,383	1,418
House Wiring	1,500	708	1,657	604
Totals	6,200	3,882	6,720	5,100

The high cost of house wiring and certification continues to be a significant barrier to legitimate electricity supply for lower income households, for which all three initiatives are targeted. JPS has collaborated with other organisations to secure bulk discounts on house wiring material as well as to supply additional labour to meet demand through training. These efforts have put downward pressure on the cost to wire and certify houses but it remains out of reach for many Jamaicans. Even when houses are wired, violence and other issues can severely delay or prevent the certification of those houses. Potential customers require constant pressure to follow through on signing a contract for legitimate supply even after having their homes certified.

The strike force initiative resulted in 283,888 illegal connections being removed, 2,127 non-metered consumers were regularised, 130 arrests were made, and about three GWh of recoveries were recorded.

Despite these challenges, JPS continues with its ambition to reverse the rampant non-technical losses in lower income areas. To this end we have focused on seeking access to funding for house wiring for individuals, and improving the economic prospects of residents in these areas. The Spin to Win initiative, formerly Grand Bonanza, garnered better public response when compared to the other initiatives and, JPS is looking at ways to capitalise on this in 2023.

5.2 System Losses Performance Outlook for 2023

The biggest challenge in 2022 was the availability of materials to complete initiatives on time and at scope. Despite these challenges, the rate of increase in system losses was not as significant as in prior years; driven by the recovering economy. JPS's internal focus is on execution of the projects planned for 2023. JPS is also committed to seeking public and private sector partnerships in order to lower the barrier to legitimate supply for low-income households and improving their economic prospects. JPS expects its initiatives to yield a loss reduction of 50 GWh in 2023, and if the current trend of growth in GDP persists then a 0.5 percentage point reduction in total system losses is a reasonable projection.

The overall system losses target should be 28.15% with technical loss at 7.90% and non-technical loss at 20.25%

6. Heat Rate Target Review

6.1 Introduction

The Electricity Licence, 2016 provides for JPS' costs to be recovered through two (2) components of rates – the non-fuel rates that are adjusted annually and the fuel tariffs that are adjusted monthly. A significant portion of JPS' operating expenses is related to the cost of fuel consumed by its generating plants for the production of electricity. This total monthly cost of fuel varies from month to month largely due to changes in the following factors:

- The price of fuel consumed by JPS thermal plants;
- The fuel conversion efficiencies (Heat Rates) of these plants;
- The amount of electricity generated by JPS' various generating plants; and
- The Generation dispatch process.

The fuel tariff is computed each month based on the cost incurred for fuel used in the previous month. The monthly total fuel costs incurred by JPS are used to derive the monthly Fuel Rates (J$/kWh) in accordance with the Fuel Cost Adjustment Mechanism (FCAM) as defined by the Licence. For a given billing period, the derived Fuel Rate is used for billing customers to allow JPS to recover the total fuel cost (net of efficiency adjustment) incurred for that period.

One (1) factor in the adjustment of the fuel tariff is the Heat Rate Factor ("H-factor"). The H-factor is designed to incentivize the efficient operation of the JPS generation fleet. The effect of the H-factor is to implement financial penalties if JPS fails to achieve regulatory-determined efficiency targets or financial rewards to the extent that JPS' generation efficiency is better than the targets. Schedule 3, paragraph 40 of the Licence states that the OUR "*shall determine the applicable heat rate (whether thermal, system, individual generating plants of the Licensee or such other methodology) and the target for the heat rate*."

In the 2019 – 2024 Rate Review Determination Notice, the OUR determined that the H-Factor that shall be used in the FCAM should be the ratio of the JPS Heat Rate target (thermal) to the JPS Heat Rate actual (thermal), which is used in the fuel pass-through formula as follows:

$$\text{Fuel Pass Through Cost} = \left[\text{IPPs Fuel Cost} + \left(\text{JPS Fuel Cost} \times \left(\frac{\text{JPS Thermal Heat Rate Target}}{\text{JPS Thermal Heat Rate Actual}}\right)\right)\right]$$

Principles for Implementation of FCAM

The OUR in JPS 2019-2024 Rate Review Determination Notice outlined that they have adopted the following principles to guide the setting of the Heat Rate targets for JPS:

- The targets should hold JPS accountable for the factors which are under its direct control;
- The targets should encourage optimal generation dispatch of the available generating units to minimize the total cost of electricity generation;
- The targets should take into account legitimate system constraints provided that JPS is taking reasonable action to mitigate these constraints;
- The targets should normally be set at the Rate Review and reviewed at each Annual Review, and adjusted as applicable, to reflect changes in system configuration and ongoing efficiency improvements; and
- The targets should be reasonable and achievable and consistent with the configuration and capability of the system during the target period.

Establishing reasonable and achievable targets requires that certain factors are weighed heavily in the target setting process. These factors include the current and future state of the assets, operating performance levels, and the impact of ongoing and OUR-approved planned investments on the Company's generation fleet to improve reliability and fuel conversion efficiency.

Final Determination 2019-2024

The OUR in Determination 20 of the 2019-2024 Final Rate Review Determination approved the following annual Heat Rate targets for the 2020-2024 regulatory periods (June to July):

- 2020–2021 Annual Review: 9,675 kJ/kWh
- 2021–2022 Annual Review: 9,667 kJ/kWh
- 2022–2023 Annual Review: 9,495 kJ/kWh
- **2023–2024 Annual Review: 9,470 kJ/kWh**

Determination 20 (2) states that:

> *"Having regard to the relevant provisions of the Licence and established regulatory precedence, the determined Heat Rate targets shall be reviewed by the Office at each Annual Review to account for efficiency improvements and factors outside the company's control, during each discrete rate adjustment period within the Rate Review period."*

This chapter provides the basis for JPS' forecast of Heat Rate performance for the 2023/24 regulatory year compared to the OUR-determined targets. The projected forecast considers factors that have, and will continue to notably affect JPS' heat rate performance. The chapter also provides an overview of JPS' Heat Rate performance for 2022 and identifies the factors outside JPS' control that affected its fuel conversion efficiency performance.

6.2 JPS Heat Rate Performance for 2022/23

The JPS thermal heat rate for 2022 was 9,767 kJ/kWh. When compared to 2021, this performance represents a 325kJ/kWh or 3% deterioration. This deterioration was mainly caused by: 1) reliability challenges on both Rockfort Units during Q1, 2) high utilization of Bogue GTs 11, 12, and 13 in simple cycle mode to maintain reliable supply and system security during the ST14 major overhaul, and 3) significant IPP reliability challenges which increased the simple cycle operation of gas turbines across the fleet.

The monthly heat rate performance ranged from a high of 11,943kJ/kWh in November 2022 to a low of 9,086kJ/kWh in February 2023. *Table 6-1* is the summary of JPS' thermal heat rate performance compared to the OUR's target over the period Jan 2022 to February 2023. The target was changed from 9,667kJ/kWh to 9,495kJ/kWh in September 2022.

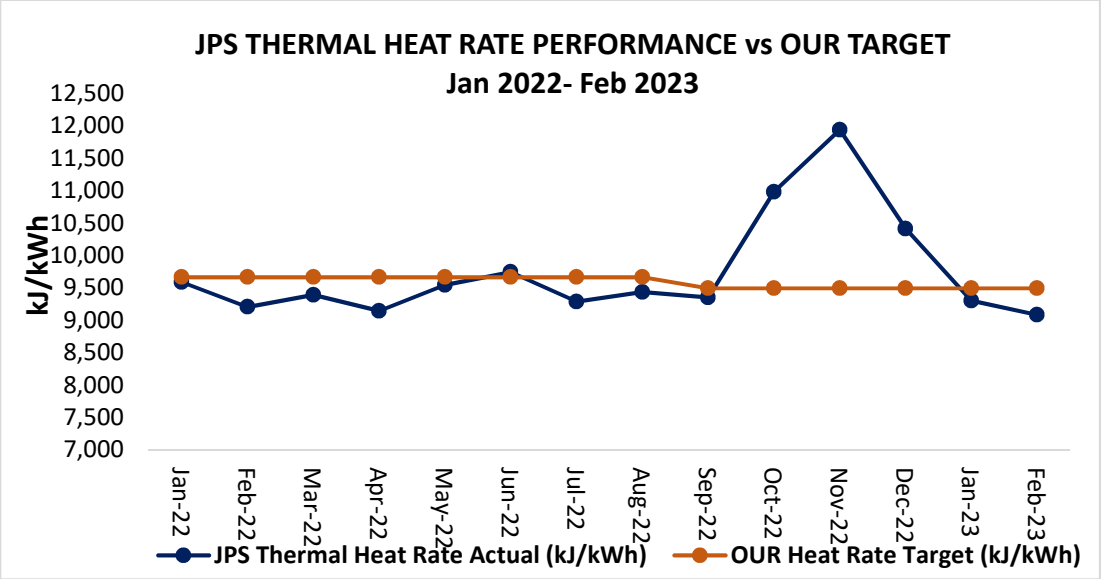
Table 6-1: JPS' heat rate performance versus target from Jan 2022 to Feb 2023

Month	JPS Thermal Heat Rate Actual (kJ/kWh)	OUR Heat Rate Target (kJ/kWh)	Variance from Target (kJ/kWh)
Jan-22	9,590	9,667	77
Feb-22	9,208	9,667	459
Mar-22	9,393	9,667	274
Apr-22	9,146	9,667	521
May-22	9,546	9,667	121
Jun-22	9,746	9,667	-79
Jul-22	9,289	9,667	378
Aug-22	9,438	9,667	229
Sep-22	9,354	9,495	141
Oct-22	10,985	9,495	-1,490
Nov-22	11,943	9,495	-2,448
Dec-22	10,415	9,495	-920
Jan-23	9,304	9,495	191
Feb-23	9,086	9,495	409

Figure 6-1 below is a graphical representation of JPS' actual heat rate performance and the targets set by the OUR over the period January 2022 to February 2023. JPS met its targets in all months except for June, October, November and December 2022, despite JPS' judicious operation of the units. In June 2022, a widening of the fuel price gap between natural gas and HFO resulted in GT11 being cheaper to dispatch than IPP HFO-fired plants. Additionally, Hunts Bay GTs were dispatched higher than expected due to challenges faced by JPPC and WKPP in the corporate area. From October to December 2022, during the Bogue ST14 major overhaul, reliability issues on NFE GT2 and other IPPs resulted in significant dispatch of GT11, GT12, and GT13. Consequently,

even though the target was met for most months in 2022, the full year performance of 9,767 kJ/kWh was worse than the average target (9,610 kJ/kWh).

Figure 6-1: JPS Heat Rate Performance vs. the Regulatory Target, Jan 2022 to Feb 2023



JPS Key Performance Indicators Overview - 2022

The system produced its second-highest net generation on record in 2022. The year's net generation was 3% higher than 2021 (4,425 GWh vs. 4,304 GWh), and 1% higher than the expected load demand of 4,387 GWh. This is a positive signal that the load demand is on the verge of fully recovering from the effects of the COVID-19 pandemic. The highest load demand of 395.6GWh was observed in the month of July while the highest peak demand of 643.9MW was observed in September. This load demand is the highest for any month on record while the peak demand is 12.3MW (2%) higher than that recorded in 2021. In terms of key performance indicators, JPS's thermal heat rate was 325kJ/kWh worse than the previous year, while JPS' Equivalent Availability Factor (EAF) ended at 88%, on par with 2021. The Equivalent Forced Outage Rate (EFOR) ended at 9%, which was 2 percentage points (pp) better than 2021 (11%). *Table 6-2* below provides the results of the Key Performance Indicators for the JPS Generation Fleet.

Table 6-2: JPS Key Performance Indicator (KPIs) 2022 vs. 2021 (Calendar year)

Operating Metrics	2021	2022	Variance
JPS Thermal Heat Rate (kJ/kWh)	9,442	9767	-325
Net Generation (GWh)	4,304	4,425	121
Peak Demand (MW)	631.6	643.9	12.3
JPS EAF	88%	88%	0pp
JPS EFOR	11%	9%	2pp

6.3 Factors Impacting JPS Heat Rate Forecast 2023/24

IPP Reliability Challenges

Reliability challenges experienced by IPPs continued to deteriorate JPS's thermal heat rate performance in 2022, primarily through the resulting increased dispatch of simple cycle gas turbines. In the current landscape, IPPs account for more than 65% of the generating capacity on the grid. In the event that IPPs experience significant availability issues and forced outages, the company frequently has to utilize its least efficient units (simple cycle peaking gas turbines) to stabilize the grid and reduce incidents of load shedding.

These challenges and the resulting increase in gas turbine dispatch was very evident in 2022, mostly due to the major forced outages experienced at the NFE CHP plant lasting more than six (6) months in total. NFE CHP averaged an availability of 47% from February to April 2022 due to GT1 being forced offline. This very low availability had some impact on the JPS thermal heat rate however, the similarly very low availability (48%) from late August to early December 2022 deteriorated the JPS thermal heat rate much more significantly due to low system wide availability of efficient capacity experienced in the period. These forced outages on NFE, coupled with reliability challenges on other thermal IPPs, especially in the latter part of the year, significantly deteriorated the JPS thermal heat rate.

Table 6-3: Capacity Factor of Simple Cycle Gas Turbines - 2022 (Calendar year)

Units	Capacity Factor	Drivers
Hunts Bay GT5 and GT10	6%	Reliability challenges on large IPP plants (JPPC – 78% EAF and 10% EFOR and NFE CHP – 68% EAF and 32% EFOR) throughout the year.
Bogue GT3 - GT9	1%	Most expensive units, least dispatched
Bogue GT11	12%	Low system wide availability due to compounding of ST14 major overhaul and IPP low availability, in addition to fuel price gap between natural gas and HFO widening in May and June, in favour of gas plants.

Bogue ST14 Major Overhaul Project

This project involved works on the 40MW steam turbine, Heat Recovery Steam Generators (HRSGs), cooling tower, generator, controls, and balance of plant over a 45-day period. The project suffered a 27-day delay due primarily to additional works required to repair worse than

expected damage to turbine rotor and stationary seals. The repairs were successfully completed and the unit returned to service on December 18th, 2022.

During the execution of the project (October to December), JPS thermal units averaged a heat rate of 11,943 kJ/kWh, a 27% deterioration relative to the 9,416kJ/kWh performance achieved prior to the outage (January to September). The significant deterioration in heat rate was due to the necessary high dispatch of gas turbines (simple cycle mode) to maintain bus voltages at the required operational levels, protect against N-1 contingency violations, and serve load demand of customers reliably. Internal assessments showed up to 105MW of active power and 65MVAR of reactive power being required from generators at different intervals within Bogue to satisfy the load demand within allowed voltage levels as per the grid code. Without the dispatch of gas turbines, numerous customers would have been impacted by severe load shedding throughout the period October to December.

Table 6-4 below highlights the average load demand throughout the ST14 major overhaul and the average thermal (firm) availability. The average system thermal availability (excluding GTs) of 499MW was 8MW less than the average load (507MW), and 81MW less than the average peak period load. Clearly, the non-GT system thermal availability was insufficient to satisfy both the average load and even more so the average peak load. These deficits were widened by about 30MW on average by the need to carry spinning reserve. With an average deficit of 38MW and average peak period deficit of 111MW, supplemental power from simple cycle gas turbines were needed to reliably serve customer load demand.

Table 6-4: Average Availability of Firm Generators vs Average Load during ST14 Major Overhaul

	Avg. Availability/Load (MW)	Total Rated Capacity (MW)	Variance (MW)
JPS Base Load Thermal (RF)	37	40	-3
IPP Thermal	462	547	-85
System Thermal (excl. GTs)	499	587	-88
Average Load	507		
Average Peak Period Load	580		

The supplementing of insufficient base load and intermediate thermal capacities was done through the dispatch of GT11, GT12 and GT13 primarily. The capacity factors of all gas turbines are shown in the table below. Bogue GTs 11, 12, and 13 were dispatched the most due to lower variable production costs.

Table 6-5: JPS Simple Cycle GTs Dispatch During ST 14 MOH

Units	Capacity Factor
Bogue GT12 and GT13	57%
Bogue GT11	30%
Bogue GT3 – GT9	2%
Hunts Bay GT5 and GT10	7%

Rockfort Reliability Challenges

The Rockfort Diesel Station is currently in its 38th year of operation. Most of its major components have now surpassed, or are near end of life. Of particular concern is the deterioration of the turbochargers on both units, which were last upgraded ~15 years ago with a guaranteed useful life of 10 years. These turbochargers are critical to achieving the 20MW MCR and optimal efficiency levels. However, based on the existing conditions, the efficiency is expected to worsen with the ongoing deterioration of the turbochargers. Two other significant components of concern are the lube oil and bearing systems. Over the past four years, numerous challenges have been experienced concerning these systems, which have caused high forced outage rates.

Another matter of concern pertains to the elevated temperatures experienced by the cylinder liner walls of the Rockfort units. Over the past two years, both units, particularly Rockfort Unit #2, have undergone several derates mainly caused by the high temperatures in the cylinder liner walls. By replacing the piston rings with chrome ceramic rings, the temperatures have been somewhat lowered, resulting in fewer derates. However, the problem of high temperatures in the cylinder liner walls persists.

Figure 6-2 below shows the actual EFOR and heat rate performance of Rockfort between 2019 and March YTD 2023. The installation of the chrome ceramic rings in 2022 helped to reduce heat rate and EFOR when compared to 2021. The performance in 2023 so far has deteriorated significantly due to 1) more frequent cooler cleaning due to of a rapid increase in marine growth, and 2) a failed big end bearing on RF2, which forced the unit offline since early January.

Figure 6-2: Rockfort Actual Performance 2019 – YTD 2023

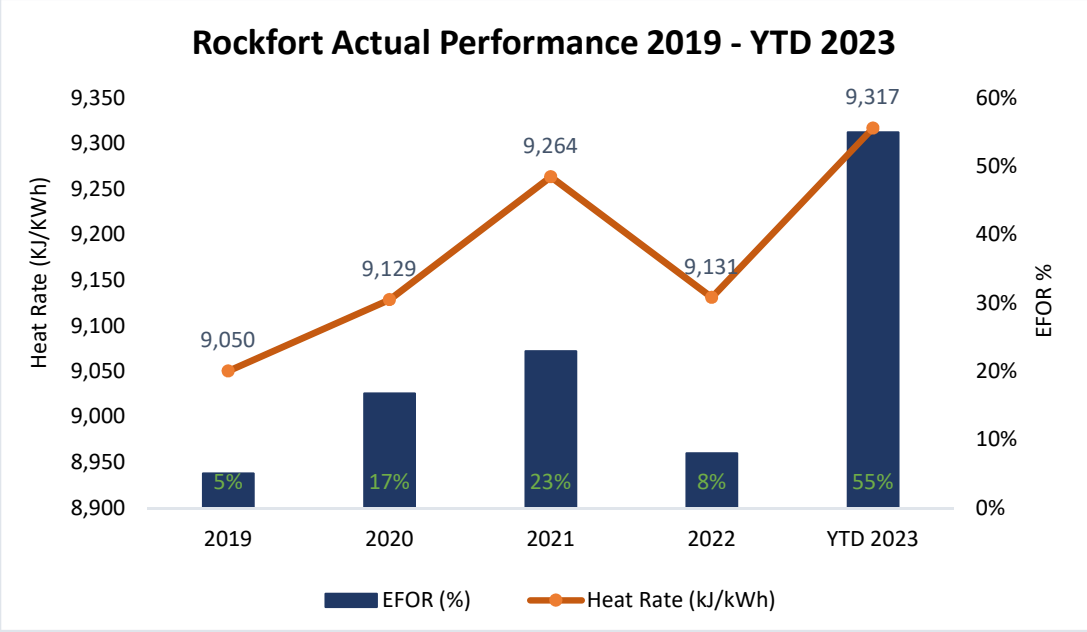
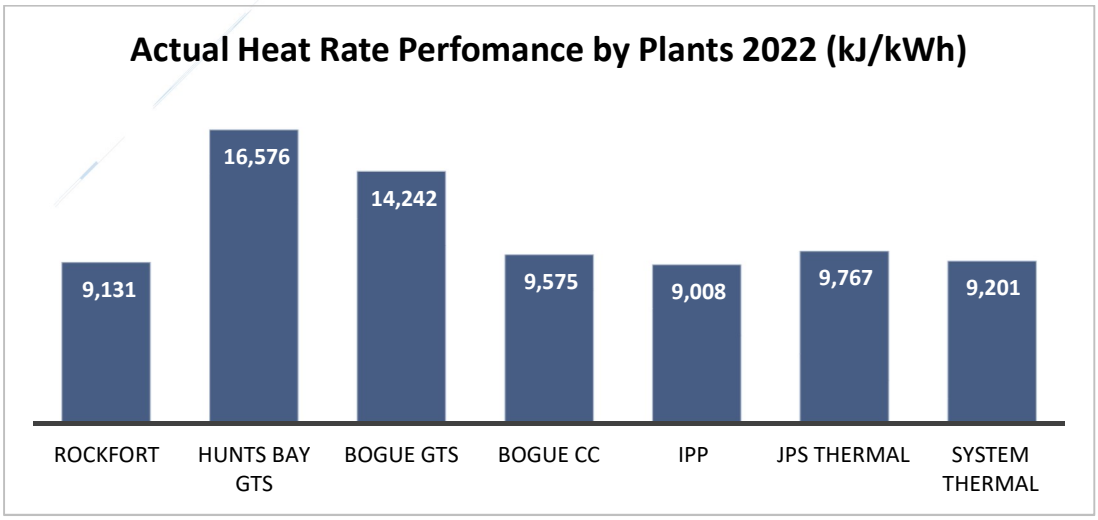


Figure 6-3 below highlights the actual heat rate performance by plant in 2022. Of notable mention are:

- The lower heat rate of Bogue GTs was driven by the high dispatch of GT11 (most efficient gas turbine) during the ST14 major overhaul.
- The high heat rate for Bogue CC was driven by the high dispatch of GT12 and GT13 during the ST14 major overhaul.
- The heat rates for Rockfort and Hunts Bay GTs were within reasonable expectations.

Figure 6-3: JPS Thermal Fleet Actual Heat Rate Performance 2022



6.4 JPS Heat Rate Performance Forecast for 2023/2024

6.4.1 Model Used

For the purposes of heat rate forecasting, JPS continues to use PLEXOS as the primary means of modelling generation dispatch. PLEXOS is a proven simulation tool that uses cutting-edge data handling, mathematical programming, and stochastic optimization techniques to provide a robust analytical framework for power market analysis. Since its release in 2000, PLEXOS has emerged as the worldwide simulation tool of choice for utilities, generators, and system operators. This technology is widely used by most of the largest utility companies and system operators across most regions of the world.

A key output from the modelling process is the heat rate performance forecast for the upcoming regulatory year. In addition to the heat rate, the modelling process also provides the forecasted capacity factor and energy production by each generating unit.

6.4.2 Projected Maximum Capacity Rating (MCR)

The table below shows the projected maximum capacity rating of the generating units on the system.

Table 6-6: System Projected Maximum Capacity Rating (MCR)

Plant	Unit	2022 MCR (MW)	2023 MCR (MW)
Rockfort	1	20.00	20.00
	2	20.00	20.00
	Subtotal	**40.00**	**40.00**
Hunt's Bay	GT #5	21.50	21.50
	GT #10	32.50	32.50
	Subtotal	**54.00**	**54.00**
Bogue	GT #3	21.50	21.50
	GT #6	14.00	14.00
	GT #7	18.00	18.00
	GT #9	20.00	20.00
	GT #11	20.00	20.00
	GT #12	40.00	40.00
	GT #13 **CCGT**	40.00	40.00
	ST #14	40.00	40.00
	Subtotal	**213.50**	**213.50**
Munro Wind		3.00	3.00
JPS Hydro	**Subtotal**	29.59	29.59
JPSCo's Total		**340.09**	**340.09**
JEP		74.16	74.16
JEP-50		50.20	50.20
JPPC		60.00	60.00
WKPP		65.50	65.50
SJPC 194		194.00	194.00
NFE SPH 94MW		94.00	94.00
JPS DG		10.00	10.00
Wigton I		20.00	20.00
Wigton II		18.00	18.00
Wigton III		24.00	24.00
Blue Mountain Wind		36.30	36.30
WRG Solar		20.00	20.00
Eight Rivers Solar		37.00	37.00
Import Sub Total		**703.16**	**703.16**
Total		**1043.25**	**1043.25**

Forecasted Capacity Factor 2023 to 2024

The following are the forecasted capacity factors for JPS' generating units and IPPs.

- Rockfort's capacity factor is forecasted to average 79% over the period.
- Hunts Bay's gas turbines capacity factor is forecasted to average 3% during the period.

- Bogue's capacity factor is forecasted to average 39% for the review period. This is inclusive of a hot gas path inspection on Bogue GT12 starting August 2023 for 23 days, and a major overhaul on Bogue GT13 starting at the tail end of April 2024 until the end of May 2024 which comprises a period of 35 days.
- JPS Hydro Renewables' capacity factor is forecasted to average 49% for the 2023 to 2024 regulatory period. This is inclusive of a major overhaul on Lower White River Hydro, turbine stationary labyrinth rings replacement, and generator overhaul on Maggotty Units #1 & #2 for 45 days.
- The capacity factor for the wind farms in the system are as follows: Wigton I: 29%; Wigton II: 33%; Wigton III: 22% and Blue Mountain Renewables: 39%. With respect to the two solar farms, the capacity factors are Eight Rivers at 25% and WRG Solar at 24%.
- The total IPP's capacity factor forecasted for the 2023 to 2024 regulatory period is 61%.
    - The overall system capacity factor forecasted for the 2023 to 2024 regulatory period is 48%.

Forecasted Energy Production

The following are the forecasted net generation for JPS' generating units and IPPs.

- Rockfort's energy production is forecasted at 276GWh for the 2023/24 period with a major overhaul on Rockfort Unit#2 starting in February for 35 days.
- Hunts Bay gas turbines energy production is forecasted at 16GWh for 2023/24
- Bogue's energy production is forecasted at 718GWh for 2023/24. This is inclusive of a 23-day Hot Gas Path Inspection on Bogue GT12 in Q3 2023 and a major overhaul on Bogue GT13 in Q2, 2024 lasting 35 days. Energy production for the Bogue peaking units is forecasted at 38 GWh for 2023/24. This is mainly due to Bogue GT11 operating at high levels due to economic dispatch because of low gas prices.
- JPS Hydro Renewables energy production is forecasted at 126 GWh for 2023/24. Energy production forecasted for the Wind farms are: BMR 117GWh, and Wigton 150 GWh. The production from the Solar Farms are as follows: WRB Solar 42 GWh and Eight Rivers Solar 80GWh.
- IPP's Thermal energy production is forecasted at 2,896 GWh for 2023/24.
- The overall system demand is forecasted to be 4,483 GWh.

6.5 Heat Rate Forecast Summary 2022/23

The JPS thermal heat rate performance over the period will depend on several factors that typically affect the economic dispatch. Some of these factors are provided below:

- Growth in system demand;
- The addition of more renewables;
- The addition of new generating units and the installed reserve margin;
- Heat rate improvements made to existing generating units;
- Availability and reliability of JPS generators;
- Availability and reliability of IPP generators;
- Absolute and relative fuel prices for JPS and the IPPs and the impact on economic dispatch;
- Spinning reserve policy;
- Network constraints and contingencies (JPS).

6.5.1 The forecasted heat rate by plants for the 2023/24 regulatory period:

The following are the forecasted heat rate for JPS thermal units and IPPs:

- Rockfort is forecasted at 9,177 kJ/kWh. This is anticipated based on a major maintenance outage on Unit#2 scheduled for February 2024.
- Hunts Bay gas turbines are forecasted at 17,413kJ/kWh, which is reflective of their peaking duties.
- Bogue Combined Cycle Plant is forecasted at 9,119kJ/kWh. This is mainly due to the 23 days hot gas path inspection on GT12 (Q3 2023) and the 35 Days Major Overhaul on GT13 (Q2 2024). Bogue gas turbines GT#3-GT#11 are forecasted at 12,467kJ/kWh as per their peaking duties.
- IPPs are forecasted at 9,115 kJ/kWh with SPH CHP operating as take as available. There are some major maintenance outages expected at SJPC and other IPP units.

6.5.2 Key Considerations

It is important to carefully consider the following factors when determining the target heat rate for this regulatory period:

- The most recent operating key performance indicators over the last year (Heat Rate, Cap Factor, EFOR, EAF) of JPS key baseload units.
- Planned Hot Gas Path Inspection on Bogue GT12 (23 days)
- Major overhaul on Bogue GT13 (35 days)
- Major overhaul on Rockfort Unit #2 (35 days)
- Heat rate deterioration and reliability challenges of Rockfort units #1 and #2

- Age of JPS' assets
- Reliability challenges faced by IPPs on the dispatch of gas turbines
- The impact of a wide fuel price gap between natural gas and HFO on GT11 dispatch
- Sufficient latitude to absorb uncertainties stemming from unforeseen reliability challenges on the system, a possible widening of the natural gas-HFO fuel price gap, a possible higher than expected load demand, and other factors. Consideration should be given to the higher impact of risks due to the smaller JPS thermal fleet (relative to the size of the fleet in 2019), which limits the ability to feasibly absorb these impacts. There are numerous potential occurrences such as major unit malfunctions to unfavourable environmental conditions that could lead to a worsening of JPS' aggregate thermal heat rate while operating as the system operator. Two mutually exclusive examples are provided below, which alone have a total impact of 153kJ/kWh:
    - If the capacity factor of Hunts Bay GTs should increase from the projected 3% to 6% (actual utilization of 2022), the 12-month JPS thermal heat rate would deteriorate by ~107kJ/kWh. This increase in utilization is probable based on the numerous potential drivers of corporate area plant reliability, higher load demand, etc.
    - If the natural gas-HFO fuel price gap widens and leads to a 2% increase in the dispatch of Bogue GTs (due to GT11), the 12-month JPS thermal heat rate would deteriorate by ~46kJ/kWh. This increase in utilization is probable based on the disparity in price movements of natural gas and HFO.

6.5.3 Proposed Regulatory Targets

Based on the heat rate performance obtained from JPS' updated forecasted model for July 2023 to June 2024, the thermal heat rate is forecasted to finish at 9,379kJ/kWh barring the impact of unforeseen events.

Table 6-7: Results of JPS Forecasted Thermal Heat Rate Model, July 2023 to June 2024

Heat Rate (kJ/kWh)	23-Jul	23-Aug	23-Sep	23-Oct	23-Nov	23-Dec	24-Jan	24-Feb	24-Mar	24-Apr	24-May	24-Jun	Year
JPS Thermal (2023\24)	9,360	9,629	9,306	9,312	9,279	9,415	9,302	9,354	9,346	9,332	9,713	9,335	**9,379**

In keeping with the principle of FCAM, JPS is proposing that its thermal heat rate target for July 2023 – June 2024 be maintained at the current target of **9,495kJ/kWh.** This would provide slightly more latitude than the 9,470kJ/kWh target to absorb impacts from possible risks not included in the base projection.

7. Tariff Design

Pursuant to Exhibit 1 of Schedule 3 of the Licence, the ART shall be adjusted on an annual basis, commencing July 1 of each year. The following sections outline JPS' proposed 2023-2024 non-fuel tariffs to take effect on the Adjustment Date for each rate class. These rates shall be set to recover the Annual Revenue Target (ART) for 2023 in keeping with the 2019-2024 Rate Review Determination and adjusted for known economic and performance factors as per the Annual Adjustment Mechanism stipulated by the Licence.

7.1 2022 Economic Review

Over the past two years, Jamaica has been grappling with a difficult global environment stemming from the impacts of the COVID-19 Pandemic, international supply chain issues, and inflation pressure arising from the Russia-Ukraine war. Notwithstanding these challenges, the Jamaican economy has been recovering strongly. The recovery is evidenced by the recorded real growth of 5.2% in the calendar year 2022, an increase of 0.6% over 2021. This significant increase in growth stems predominantly from the continued recovery in Tourism and related activities that were boosted by the return of stopover arrivals to their pre-COVID-19 level.

Although economic activities are comparable to pre-COVID levels, JPS total energy sales for 2022 (3,065 GWh) remains below pre-COVID-19 levels (3,185 GWh) by approximately 4%. Notwithstanding, energy sales is recovering steadily following the slump recorded during the pandemic (2,938 GWh). This dampened performance can be attributed to the general increase in prices across the economy and with respect to key electricity supply inputs.

The inflation ended the year at 9.4%, or 3.4% outside the Bank of Jamaica's target range of 4% - 6%. The sharp rise in domestic prices was driven by exogenous factors, primarily global economic and political conditions. STATIN reported an average 2.8 % increase in utility related services.
Fuel prices during 2022 were significantly higher relative to 2021 owing to the Russia-Ukraine war disrupting global fuel markets. The West Texas Intermediate (WTI) price fuel index averaged - US$94.79/bbl. compared to US$67.99/bbl in 2021. This represents an average increase of approximately 40%; in particular, WTI peaked at US$114.84/bbl. in the summer of 2022.

The LNG market also saw a significant price increase over the review period. The Henry Hub price averaged US$6.42/MMBTU in 2022 compared to the US$3.91 recorded in 2021. This reflects an increase of well over 50%. The Gas market also recorded its highest prices during the summer of 2022.

The local Foreign Exchange market was less volatile during 2022 when compared to the heightened volatility experienced in 2021.The Jamaican dollar closed the year at a weighted average selling rate of JS154.27: US1.00, a depreciation of 1.8% over the 2021 year-end weighted average selling rate of JS$151.49: US1.00.

7.1.1 2022 Sales Performance Review

JPS recorded a total of 3,065 GWh in electricity billed sales for 2022, an increase of approximately 3% relative to the prior year. This improvement was driven by the robust growth experienced across the commercial and industrial customer segments underpinned by economic activity returning to normalcy in key Service and Goods producing industries.

RT40 saw an increase of 4.4%, approximately 33 GWh relative to sales recorded for the prior year. This was the only industrial/commercial customer category that recorded an increase below 5%. Both RT20 and RT50 recorded increases of approximately 8%, or an increase of approximately 43 GWh and 19 GWh respectively. RT70 saw a significant increase of 14%, an increase of approximately 28 GWh. This is attributable to a large customer increasing its load from the grid.

Residential consumption returned to its pre-COVID level as workers continued their return to the office. This resulted in a decline of 3.8% (42 GWh) relative to 2021. The decline of 16% or approximately 8 GWh recorded in the Street-lighting segment reflects the expected results of the completion of the Smart Streetlight Programme which saw the all lamp fixtures being replaced with more efficient LED technology.

JPS' energy sales performance was relatively similar to the OUR approved 2022 target with only a 0.2% negative variance or approximately 7 GWh less. This variance was driven by weaker sales relative to target for residential and large industrial customers. Sales performance for RT70 customer was better than expected by approximately 9.5% (28 GWh).

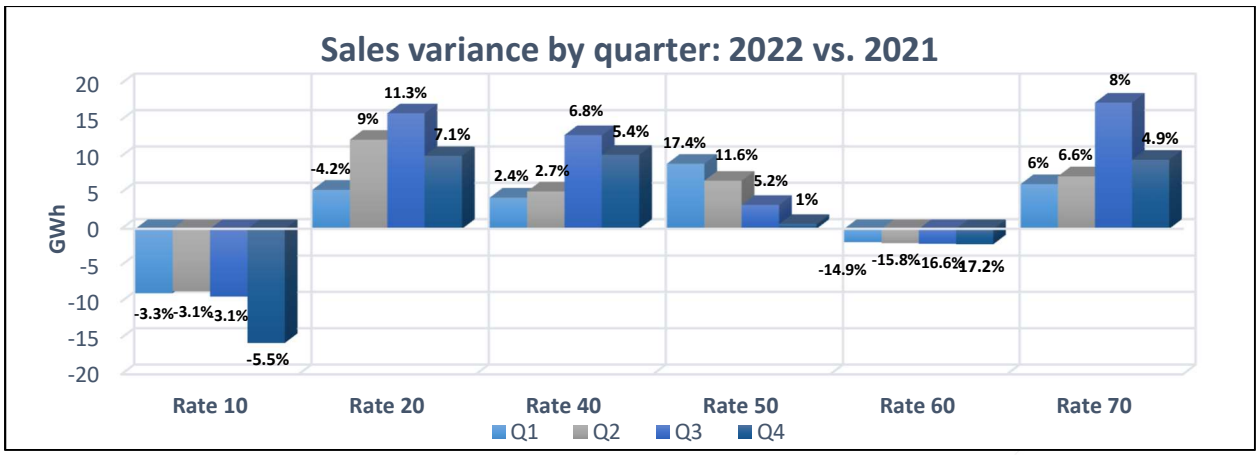
Table 7-1 below provides a summary of the recorded sales relative to the prior year.

Table 7-1: 2022 Billed Energy Sales Performance

	2021 Actual	2022 Actual	2022 OUR Target	2022 *vs 2021* Actual		2022 Act *vs. Target*	
	GWh	GWh	GWh	GWh	%	GWh	%
Rate 10	1,123	1,081	1,090	(42)	-3.8%	(9)	▼-0.8%
Rate 20	546	589	591	44	8.0%	(2)	▼-0.3%
Rate 40	743	775	792	33	4.4%	(17)	▼-2.1%
Rate 50	236	256	260	19	8.2%	(4)	▼-1.5%
Rate 60	49	41	45	(8)	-16.1%	(4)	▼-7.9%
Rate 70	282	322	294	40	14.3%	28	▲9.5%
Total	2,980	3,065	3,072	85	2.9%	(7)	▼-0.2%

Values exclude unregulated sales volume

Figure 7-1: Sales (GWh) volume comparison by Quarter for 2022 vs 2021



Residential energy sales experienced an average decline of 3.8% across all quarters of 2022 compared to 2021. The is consistent with expectations as household activities and usage patterns further normalized post the COVID-19 pandemic.

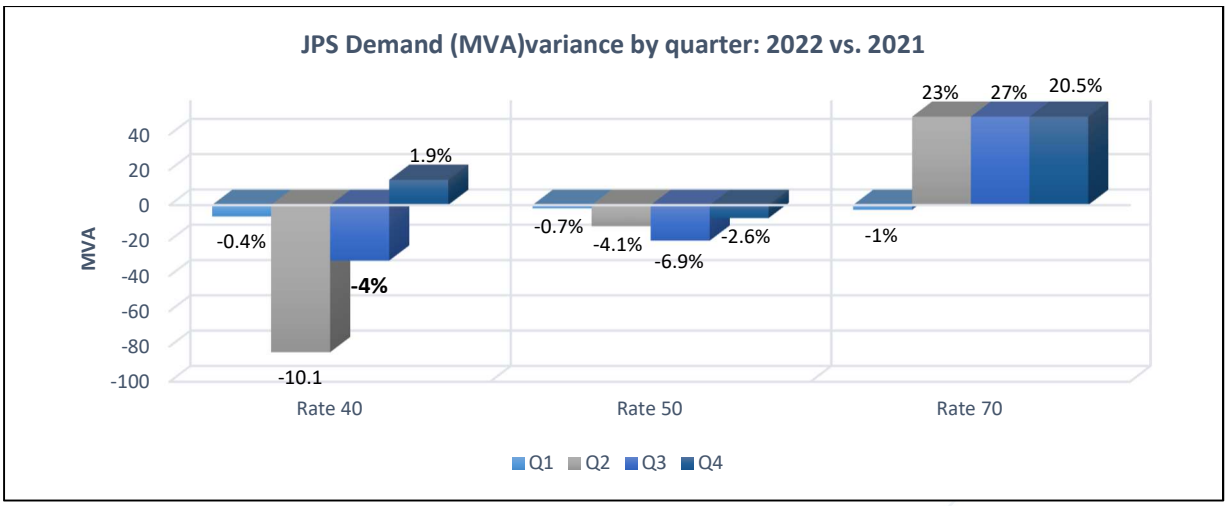
Commercial and Industrial energy sales saw an average increase of 7.5% across all quarters of 2022. Quarter 3 recorded growth of more than 10% whereas the other three quarters recorded growth ranging from approximately 6% to 7%. The growth recorded in commercial and industrial energy sales was primarily attributed to the strengthening of economic activities across most industries, in particular Hotels & Restaurants and its allied industries, which showed signs of returning to and, in some instances surpassing its pre-COVID levels.

Total billed MVA demand recorded an increase of 0.5% (24 MVA) relative to 2021. The majority of this increase is accredited to Rate 70, which experienced an average growth of approximately 24% between the second and fourth quarter. The first quarter recorded a marginal reduction as economic activities related to the sector were still constrained due to restrictions associated with the pandemic.

Conversely, both Rate 40 and Rate 50 recorded an average decline of 3.3% and 3.6% respectively across all four quarters in 2022.

Rate 40 experienced an average decline of approximately 5% across the first three quarters of 2022 before recovering in quarter four with growth of approximately 1.9%. Rate 50 however experienced negative growth for all four quarters of 2022.

Figure 7-2: Demand MVA variance by Quarter for 2022 vs 2021



7.2 2023 Outlook and Demand Forecast

The Planning Institute of Jamaica (PIOJ) has estimated a growth in the overall economy within the range of 1% - 3% for the fiscal year 2023/24. This is also in keeping with the International Monetary Fund's (IMF) expected growth of 2% for 2023. The outlook reflects the normalization of economic output post the COVID-19 pandemic and a return to the long-term growth trend. Underscoring the expected growth are: the continued strong performance for visitor arrivals in the tourism sector, high levels of output from the Construction industry, and the expected return of the headline inflation rate to within then Bank of Jamaica's target range of 4% to 6%.

Downside risks includes; slower than expected recovery in Jamaica's main trading partners which is expected to temper external demand, continued tightened monetary policy conditions within the local and global economy, as well uncertainty as it relates to the Russia-Ukraine war and its impact on key commodity prices.

For the 2023 Outlook, inflationary pressure is expected to ease relative to the prior year as commodity markets begin to normalize. The Bank of Jamaica reports an inflation rate of 7.8% and 6.2% for the months of February and March 2023 respectively, which compares to the average rate of 10.7% reported for the similar period in prior year. The BOJ's policy interest rate remains above pre-pandemic levels at 7% to maintain tight liquidity of the Jamaican dollar, to foster relative stability in the foreign exchange market, and aid in managing near-term risks that may be associated with elevated inflationary drivers.

For 2023, global crude oil prices are expected to decline - continuing the downward trend seen in Q4 2022 and against the peak of US$110 per/bbl. prior year. The US Energy Information Agency (EIA) is projecting the West Texas Intermediate (WTI) spot price benchmark to close the year at approximately US$80 per barrel. This compares to the average price per barrel US$94.79 for 2022. Underscoring the anticipated reduction is the March 2023 WTI index of US$73.28/bbl. which compares favourably to the US$108.50/bbl. reported in March 2022.

A downward trend is also projected for the Gas market by the EIA with an average price of US$2.94/MMBtu for the 2023 outlook period. This reflects a significant reduction relative to 2022 when Gas prices averaged US$6.42/MMBtu as per the Henry Hub spot price index. Average price for the quarter ending March 2023 was reported at US$2.65/MMBtu, a reduction of approximately US$2 in the average price for the same quarter in 2022. Henry Hub LNG prices are estimated to close the year at US$3.80/MMBtu.

7.2.1 2023 Billing Determinant Forecast

The forecast for electricity demand is a key factor in the determination of non-fuel tariffs.

As general economic output returns to typical levels post COVID-19 pandemic, electricity demand is anticipated to continue its recovery in keeping with growth trends for the macro economy and typical usage patterns - specifically for key sectors such as Tourism & related services as well as Manufacturing. As such, electricity overall demand is projected to return to near normal levels seen before the onset of the pandemic.

The following sections presents JPS' review of the electricity forecast and targets established within the 2019-2024 Rate Review Determination Notice as part of the forward looking PBRM, giving due consideration to the 2022 sales performance and the anticipated outlook for the 2023 regulatory period in conjunction with medium-term economic expectations.

7.2.2 2023 Energy Sales

JPS conducted a review of forecast electricity sales as outline in the 2019 Determination Notice and established the initial target for the 2023 rate period at 3,287 GWh. Given the changes brought on by the COVID-19 pandemic and the shifting away from the typical trajectory of demand and the macro economy, this forecast was subject to review and fine-tuning. Subsequent Annual Determinations evidenced this as sales projections were reviewed and new targets were established for 2021 and 2022 by the OUR.

In its 2022 annual review, the OUR stated that its revised forecast were developed using the Autoregressive Integrated Moving Average (ARIMA) methodology given its stability, statistical robustness and relative accuracy in short to medium-term forecasts. In setting final targets, the results of the OUR's ARIMA model were compared with JPS' proposed 2022 targets and a 3% variance rule applied to either accept JPS' values or take the average of the two forecasts. JPS and the OUR had agreed to the methodology since the 2021 Final Determination Notice.

For 2023, JPS' performed a disaggregated short-term energy sales projection using the Seasonal Autoregressive Integrated Moving Average Exogenous (SARIMAX) model, accounting for economic, sales and other variables found to be statistically significant. This analysis was conducted across all distribution feeders, the result of which forms the basis of JPS 'short-term demand forecast. As such, JPS proposes that the 2023 billed energy sales target be set at 3,105 GWh in keeping with its SARIMAX analysis and economic outlook for the 2023/24 regulatory period. This represents an increase of 1.3% (40 GWh) over actual sales for 2022. Notably, RT60 is expected to see a reduction as the Smart Streetlight programme was completed and therefore all

lamps have replaced with more efficient LED fixtures. The reduction in RT70 is partly informed by market intelligence which suggest some customers are likely to being self-generating. *Table 7-2* below outlines JPS' 2023 forecast for each rate class.

As underlying economic conditions have significantly changed since the 2019 Determination Notice, JPS anticipates that the OUR will conduct a similar review of the initial 3,287 GWh target set out for the 2023 regulatory period.

Table 7-2: JPS 2023 Energy Sales forecast by Rate Class

	2021 Actual	2022 Actual	2022 OUR Target (ARIMA)	JPS 2023 Forecast (SARIMAX)	Variance Forecast 2023 v 2022 Actual	Variance Forecast 2023 v 2022 Actual
	(GWh)	(GWh)	(GWh)	(GWh)	(GWh)	%
Rate 10	1,123	1,081	1,090	1,090	8.7	0.8%
Rate 20	546	589	591	605	15.8	2.7%
Rate 40	743	775	792	790	14.8	1.9%
Rate 50	236	256	260	270	13.6	5.3%
Rate 60	49	41	45	41	(0.1)	-0.3%
Rate 70	282	322	294	310	(12.4)	-3.8%
Total	2,980	3,065	3,072	3,105	40	1.3%

7.2.3 Demand MVA

Table 7-3 below illustrates JPS' forecast for 2023 relative to 2022 actual performance and the OUR approved target. Billed MVA demand is generally more stable in comparison to energy consumption once production and commercial activities are ongoing within the economy. As such, JPS is projecting further recovery in billed kVA in keeping with its general underlying economic assumptions for 2023.

On review, MVA performance has demonstrated incremental growth in the two immediate years post COVID-19. 2022 showed an increase of approximately 24 MVA (0.5%) relative to 2021, albeit being below the OUR's target. This relatively small growth trend is anticipated to continue as commercial and industrial activities in key sectors continue to normalize.

For 2023, JPS is projecting a total of 5,307 MVA for billed demand. This represents an increase of 84 MVA or approximately 1.6% growth relative to 2022 performance. At the rate class level, growth is tempered by a significant decline expected in the RT 70 – Wholesale category. All other customer groups forecast strong growth.

Table 7-3: JPS Historical Performance & 2023 kVA Demand Projections

Rate Class	2021 JPS Actuals	2022 OUR Det	2022 JPS Actual	OUR Det *vs. Actual 2022* kVA	%	JPS Forecast *vs 2022 Actual* JPS Forecast	kVA	%
RT 40 Total	**3,059,939**	**3,109,168**	**2,952,685**	**(156,483)**	**-5.0%**	**3,056,476**	**103,792**	**3.52%**
Standard	2,280,965	2,317,231	2,188,020	(129,211)	-5.6%	2,252,770	64,751	2.96%
TOU	778,974	791,937	764,665	(27,272)	-3.4%	803,706	39,041	5.11%
RT 50 Total	**1,134,476**	**1,149,672**	**1,092,908**	**(56,764)**	**-4.9%**	**1,146,422**	**53,514**	**4.90%**
Standard	647,615	657,344	644,158	(13,186)	-2.0%	651,507	7,349	1.14%
TOU	486,861	492,328	448,750	(43,578)	-8.9%	494,915	46,165	10.29%
RT70 Total	**1,004,938**	**1,040,568**	**1,177,751**	**137,183**	**13.2%**	**1,104,065**	**(73,687)**	**-6.26%**
Standard	661,594	699,779	748,814	49,035	7.0%	714,742	(34,072)	-4.55%
TOU	343,344	340,789	428,938	88,149	25.9%	389,323	(39,615)	-9.24%
Total	**5,199,353**	**5,299,408**	**5,223,344**	**(76,064)**	**-1.44%**	**5,306,963**	**83,618**	**1.60%**

7.2.4 2022 Customer Forecast

Table 7-4 illustrates the customer forecast for the 2023/24 regulatory period. JPS is forecasting a marginal increase in its average customer base from 691,807 to 692,708. This represents only a 013% growth relative to 2021 and is in keeping with observable historical trends and underlying economic conditions.

Table 7-4: JPS 2023 Customer Forecast

Rate Class	2021 JPS Actual	2022 OUR Det	2022 JPS Actual	2023 JPS Forecast	Variance wrt 2022
Rate 10	618,726	621,150	619,159	619,431	0.04%
Rate 20	69,837	70,952	70,088	70,659	0.81%
Rate 40	1,899	1,926	1,892	1,932	2.11%
Rate 50	149	151	149	152	2.01%
Rate 60	505	505	495	510	3.03%
Rate 70	24	24	24	24	0.00%
Total	**691,140**	**694,708**	**691,807**	**692,708**	**0.13%**

7.3 JPS Revenue Basket and Proposed Non-Fuel Tariffs for 2023

For 2023 regulatory year, JPS proposes an Annual Revenue Target (ART) of J$ 55.084 billion dollars at an exchange rate of J$155:US$1 in keeping with the Performance Based Rate Making Mechanism as outlined in Exhibit 1 of the 2016 Licence. The PBRM chapter of this application

Table 7-5: JPS Proposed Revenue Basket and Annual Revenue Target (ART) for 2023

Class		Customer Charge Revenues-J$	Energy Revenues-J$				Demand Revenues-J$				Total Revenue
			Std.	Off-Peak	Part Peak	On-Peak	Std.	Off-Peak	Part Peak	On-Peak	
Rate 10	LV < 100	4,908,243,982	4,876,018,423	-	-	-	-	-	-	-	9,784,262,405
Rate 10	LV > 100	-	14,391,486,660	-	-	-	-	-	-	-	14,391,486,660
Rate 20	LV	1,195,434,284	6,613,163,083	-	-	-	-	-	-	-	7,808,597,368
Rate 40	LV - STD	215,213,238	5,108,073,349	-	-	-	7,851,507,527	-	-	-	13,174,794,115
Rate 40	LV - TOU	13,413,732	-	339,228,846	313,895,839	91,334,844	-	113,214,705	393,173,048	435,453,314	1,699,714,327
Rate 50	MV -STD	15,075,610	1,145,991,052	-	-	-	1,543,279,891	-	-	-	2,704,346,553
Rate 50	MV -TOU	2,848,934	-	115,065,523	100,066,609	30,376,856	-	72,886,204	191,598,852	183,251,891	696,094,868
Rate 70	MV -STD	2,374,112	1,335,910,656	-	-	-	2,177,506,685	-	-	-	3,515,791,453
Rate 70	MV -TOU	474,822	-	86,925,546	109,298,416	60,269,883	-	45,960,414	129,630,289	167,926,779	600,486,150
Rate 60	S	8,998,662	676,928,087	-	-	-	-	-	-	-	685,926,749
Rate 60	T	15,173,276	7,766,268	-	-	-	-	-	-	-	22,939,544
TOTAL		**6,377,250,653**	**34,155,337,579**	**541,219,914**	**523,260,863**	**181,981,583**	**11,572,294,103**	**232,061,323**	**714,402,188**	**786,631,985**	**55,084,440,192**

provides details of the computations. In deriving the 2023 revenue basket, a uniform adjustment of 14.38% was applied to each revenue component for all customer groups.

Revenue recovery per rate class and billing determinants are show in the following tables below.

Table 7-6 below shows the proposed billing determinants for each rate category is in keeping with the JPS' 2023 forecast for the 2023/24 regulatory year. Total energy sales are projected to be about 3,105 GWh. MVA demand and the average number of billed customers is estimated to end the year at 5,307 MVA and 692,709 respectively.

Table 7-6: JPS' Proposed Billing Determinants - 2023

Class		Average 2023 Customer	Energy kWh				Demand-KVA			
			Std.	Off-Peak	Part Peak	On-Peak	Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV < 100	619,431	532,999,472							
Rate 10	LV > 100		556,610,302							
Rate 20	LV	70,659	605,237,296							
Rate 40	LV - STD	1,823	675,714,046				2,252,770			
Rate 40	LV - TOU	109		53,364,250	48,308,736	12,589,466		286,741	284,342	232,624
Rate 50	MV -STD	118	222,411,253				651,507			
Rate 50	MV -TOU	34		22,671,476	19,214,965	5,224,258		176,042	187,771	131,101
Rate 70	MV -STD	19	264,401,752				714,742			
Rate 70	MV -TOU	5		16,002,305	19,573,995	9,667,303		131,761	134,585	122,977
Rate 60	S	189	40,777,413							
Rate 60	T	321	532,634							
TOTAL		**692,709**	**2,898,684,168**	**92,038,031**	**87,097,696**	**27,481,027**	**3,619,019**	**594,544**	**606,698**	**486,702**

The 2023 tariffs are computed as the quotient of the revenue components of the 2023 ART, and the 2023 Billing Determinants. *Table 7-7* below shows proposed non-fuel tariffs for the 2023/24 regulatory year.

Table 7-7: JPS' Proposed Non-Fuel Tariffs for 2023

Class		Customer Charge	Energy-J$/kWh				Demand-J$/KVA			
			Std.	Off-Peak	Part Peak	On-Peak	Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV < 100	660.32	9.15							
Rate 10	LV > 100	660.32	25.86							
Rate 20	LV	1,409.86	10.93							
Rate 40	LV - STD	9,857.53	7.56				3,485.27			
Rate 40	LV - TOU	9,857.53		6.36	6.50	7.25		394.83	1,382.75	1,871.92
Rate 50	MV -STD	9,857.53	5.15				2,368.78			
Rate 50	MV -TOU	9,857.53		5.08	5.21	5.81		414.03	1,020.38	1,397.79
Rate 70	MV -STD	9,857.53	5.05				3,046.56			
Rate 70	MV -TOU	9,857.53		5.43	5.58	6.23		348.82	963.19	1,365.51
Rate 60	S	3,949.91	16.60							
Rate 60	T	3,949.91	14.58							

7.3.1 Average Tariff impact

The Performance Based Annual Rate Adjustment Mechanism allows for adjustments in JPS' revenue requirement in keeping with prevailing inflation rates. As seen around the world, inflation remains at elevated levels which, like most companies, directly impacts JPS' input costs, largely denominated in the US currency. As such this adjustment is made to JPS' non-fuel to allow for the recovery of the cost to supply, distribute, and maintain a reliable electricity service.

Movement in foreign exchange and JPS 'efficiency are also important factors under the PBRM, which influences the annual adjustment.

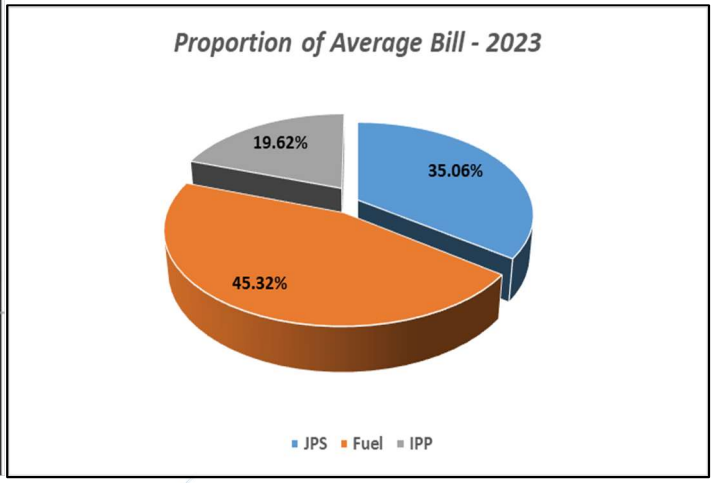
It should be noted that under PBRM, it JPS' base non-fuel tariffs that are adjusted to reflect current prices and therefore tariffs are largely held constant in real terms under the Revenue Cap. For 2023, this adjustment is approximately 13.15% relative to 2022. However, the average billing impact is expected to see a reduction as fuel prices are projected to improve throughout the year based on JPS' generation estimates and the outlook for oil and natural gas prices. JPS estimates a reduction from the current average tariff of JS$49.08 to J$48.75 under its 2023 proposal. This reflects a marginal reduction of 0.69%.

Table 7-8 below summarizes the likely average tariff impact in keeping with the rate proposal in the above sections. *Figure 7-3Figure 7-3: Percentage Share of the Avg Bill Figure 7-3: Percentage Share of the Avg Bill*, shows the relative proportion of the typical bill, 36% of which is directly related to JPS, the remaining 64% goes toward to the costs of fuel and IPP, which are a pass-through and does not contribute to JPS' non-fuel rates approved by the OUR. That is, for every J$1 reflected on a customer's bill, only J$0.35 cents goes to JPS. This however, would decrease to approximately J$0.30 cents if the General Consumption Tax (GCT) is applied.

Table 7-8: Average 2023 Bill Impact

	Current Rates	JPS Propsed 2023
Annual Revenue Target (ART) *JSM*	48,160	55,084
Variance JSM		6,924
ART Increase *vs 2021*		*14.38%*
Avg Non- Fuel JPS Forecast GWh	3,072	3,105
Average Non-Fuel Tariff(J$/kWh)	15.68	17.74
Non-fuel Tariff Increase		***13.15%***
Fuel & IPP Rates (J$/kWh)		
Average Fuel	23.55	21.15
Average IPP	9.86	9.86
Total Overall Average Tariff	**49.08**	**48.75**
Estimated Bill Impact		***-0.69%***

Figure 7-3: Percentage Share of the Avg Bill



7.3.2 Bill Impact Assessment by Rate Class

Table 7-9 presents the estimated bill impact for customers across the various rate class using the average monthly consumption for each rate class. For fuel, JPS computed the current and projected average fuel rates under the respective scenarios as shown in above. To compute the bill impact for large commercial and industrial customers, JPS applied the existing fuel weighting to the average current and forecasted fuel charges shown in above. Non-fuel IPP costs are held constant.

All customers are expected an overall bill reduction with the exception of residential service and RT40, which will see a marginal increase of 0.8% and 0.2% respectively. Other commercial and industrial customers will see reductions above 2.3%.

Table 7-9: Average Bill Impact by Customer Class

Tariff Category	Current Rates				2023 Proposed Rates				Total Bill Impact	
	Non-Fu	Fuel	IPP	Total	Non-Fue	Fuel	IPP	Total	J$	%
RT 10- Residential	19.38	23.55	9.86	52.79	22.19	21.15	9.86	53.20	0.41	0.77%
RT 20- General Service	11.55	23.55	9.86	44.95	12.90	21.15	9.86	43.91	(1.04)	-2.32%
RT 40 -Large Commercial LV	16.42	22.61	9.86	48.88	18.83	20.31	9.86	48.99	0.11	0.23%
RT 50 - Large Commercial MV	11.43	22.61	9.86	43.90	12.62	20.31	9.86	42.78	(1.12)	-2.55%
RT 70 - Wholesale Commercia	12.26	22.61	9.86	44.72	13.29	20.31	9.86	43.46	(1.27)	-2.83%
RT 60 - Streetlighting	13.88	23.55	9.86	47.28	17.16	20.31	9.86	47.32	0.04	0.08%
Total	**15.68**	**23.55**	**9.86**	**49.09**	**17.74**	**21.15**	**9.86**	**48.75**	**(0.34)**	**-0.69%**

7.3.3 Bill Simulation by Rate Class

The following tables illustrates the estimated bill impact for the typical customer within each rate class.

A residential customer with usage of less than 100 kWh per month is estimated to see a decline in their total bill of approximately 0.7%.

Table 7-10: Bill Impact Simulation for the typical Rate 10 customer below 100 kWh/month

Current Bill			
Description	**Usage**	**Rate**	**Charges ($)**
Non-Fuel Charges			
Energy 1st	100	7.93	793.00
Energy Next	-	22.76	-
Customer Charge		575.72	575.72
Sub Total			1,368.72
F/E Adjustment			-
Total Non-Fuel Charges			**1,368.72**
Base/Exchange Rate	155	155.0000	
Fuel & IPP Charges	100	23.550	2,355.00
IPP Variable Charges	100	9.860	986.00
Taxable Charges			-
GCT @ 15.0%			-
Bill Total			**4,709.72**

Estimated New Bill			
Description	**Usage**	**Rate**	**Charges ($)**
Non-Fuel Charges			
Energy 1st	100	9.15	915.00
Energy Next	-	25.86	-
Customer Charge		660.32	660.32
Sub Total			1,575.32
F/E Adjustment			-
Total Non-Fuel Charges			**1,575.32**
Base/Exchange Rate	155	155.0000	
Fuel Charges	100	21.150	2,115.00
IPP Charges	100	9.860	986.00
Taxable Charges			-
GCT @ 15.0%			-
Bill Total			**4,676.32**
		Bill Impact	**-0.71%**

A residential customer with an average consumption of 150 kWh per month will see a very marginal increase of 0.02%.

Table 7-11: Bill Impact Simulation for the typical Rate 10 customer using 150 kWh/month

Current Bill			
Description	**Usage**	**Rate**	**Charges ($)**
Non-Fuel Charges			
Energy 1st	100	7.93	793.00
Energy Next	50	22.76	1,138.00
Customer Charge		575.72	575.72
Sub Total			2,506.72
F/E Adjustment			-
Total Non-Fuel Charges			**2,506.72**
Base/Exchange Rate	155	155.0000	
Fuel & IPP Charges	150	23.550	3,532.50
IPP Variable Charges	150	9.860	1,479.00
Taxable Charges			-
GCT @ 15.0%			-
Bill Total			**7,518.22**

Estimated New Bill			
Description	**Usage**	**Rate**	**Charges ($)**
Non-Fuel Charges			
Energy 1st	100	9.15	915.00
Energy Next	50	25.86	1,293.00
Customer Charge		660.32	660.32
Sub Total			2,868.32
F/E Adjustment			-
Total Non-Fuel Charges			**2,868.32**
Base/Exchange Rate	155	155.0000	
Fuel Charges	150	21.150	3,172.50
IPP Charges	150	9.860	1,479.00
Taxable Charges			-
GCT @ 15.0%			-
Bill Total			**7,519.82**
		Bill Impact	**0.02%**

A RT20 customer with an average consumption of 750 kWh per month should see a decline of approximately 2.3% relative to their current typical bill.

Table 7-12: Bill Impact Simulation for a Rate 20 customer at 750 kWh

Current Bill			
Description	**Usage**	**Rate**	**Charges ($)**
Non-Fuel Charges			
Energy	750	9.78	7,335.00
Customer Charge		1,227.56	1,227.56
Sub Total			8,562.56
F/E Adjustment			-
Total Non-Fuel Charges			**8,562.56**
Base/Exchange Rate	155.00	155.00	
Fuel Charges	750	23.550	17,662.50
IPP Variable Charges	750	9.860	7,395.00
Taxable Charges			33,620.06
GCT @ 15.0%			5,043.01
Bill Total			**38,663.07**

Estimated New Bill			
Description	**Usage**	**Rate**	**Charges ($)**
Non-Fuel Charges			
Energy 1st	750	10.93	8,197.50
Customer Charge		1,409.86	1,409.86
Sub Total			9,607.36
F/E Adjustment			-
Total Non-Fuel Charges			**9,607.36**
Base/Exchange Rate	155.00	155.00	
Fuel Charges	750	21.150	15,862.50
IPP Charges	750	9.860	7,395.00
Taxable Charges			32,864.86
GCT @ 15.0%			4,929.73
Bill Total			**37,794.59**
		Bill Impact ▼	**-2.25%**

The standard RT40 customer with an average consumption of 35,000 kWh for the month and a kVA demand of 100 is estimated to see a marginal increase of approximately 0.5% over their current bill.

Table 7-13: Bill Impact Simulation for a Rate 40 Customer at 35,000 kWh and 100 kVA

Current Bill			
MT40 STD	**Usage**	**Rate**	**Charges**
kWh Std	35,000.0	6.59	230,650.00
kVA Std	100.0	2,962.42	296,242.00
Customer Charge		8,648.74	8,648.74
Total Non-Fuel			**535,540.74**
F/E Adjust	155.00	155.00	-
Fuel Charge	35,000.0	22.61	791,280.00
IPP Fixed Charge	100.0	664.67	66,467.00
IPP Variable Charge	35,000.0	2.12	74,200.00
Taxable Charges			1,467,487.74
GCT Charge		15.0%	220,123.16
Total Bill			**1,687,610.90**

Estimated New Bill			
MT40 STD	**Usage**	**Rate**	**Charges**
kWh Std	35,000.0	7.56	264,600.00
kVA Std	100.0	3,485.27	348,527.00
Customer Charge		9,857.5	9,857.53
Total Non-Fuel			**622,984.53**
F/E Adjust	155.00	155.00	-
Fuel Charge	35,000.0	20.30	710,640.00
IPP Fixed Charge	100.0	664.67	66,467.00
IPP Variable Charge	35,000.0	2.12	74,200.00
Taxable Charges			1,474,291.53
GCT Charge		15.0%	221,143.73
Total Bill			**1,695,435.26**
	Bill Impact ->>	▲	**0.46%**

The standard RT50 customer with an average consumption of 500,000 kWh for the month and a kVA demand of 1,500 is estimated to see a decline of approximately 2.2% over their current bill.

Table 7-14: Bill Impact Simulation for a Rate 50 Customer at 500,000 kWh and 1500 kVA

Current Bill			
MT50 STD	**Usage**	**Rate**	**Charges**
kWh Std	500,000.0	4.67	2,335,000
kVA Std	1,500.0	2,052.65	3,078,975
Customer Charge		8,648.74	8,649
Total Non-Fuel			**5,422,624**
F/E Adjust	155.0	155.00	-
Fuel Charge	500,000.0	22.61	11,304,000
IPP Fixed Charge	1,500.0	1,745.29	2,617,935
IPP Variable Charge	500,000.0	0.42	210,000
Taxable Charges			19,554,559
GCT Charge		15.0%	2,933,184
Total Bill			**22,487,743**

Estimated New Bill			
MT50 STD	**Usage**	**Rate**	**Charges**
kWh Std	500,000.0	5.15	2,575,000.0
kVA Std	1,500.0	2,368.78	3,553,170.0
Customer Charge		9,857.53	9,857.5
Total Non-Fuel			**6,138,027.5**
F/E Adjust	155.00	155.00	-
Fuel Charge	500,000.0	20.30	10,152,000.0
IPP Fixed Charge	1,500.0	1,745.29	2,617,935.0
IPP Variable Charge	500,000.0	0.42	210,000.0
Taxable Charges			19,117,962.5
GCT Charge		15.0%	2,867,694.4
Total Bill			**21,985,656.9**
		Bill Impact ->>	**-2.23%**

The standard Rate 70 customer with an average consumption of 1,000,000 kWh for the month and a kVA demand of 2,500 is estimated to see a decline of over 3%.

Table 7-15: Bill Impact Simulation for a Rate 70 Customer at 1,000,000 kWh and 2500 kVA

Current Bill			
MT70 STD	**Usage**	**Rate**	**Charges**
kWh Std	1,000,000	4.66	4,660,000
kVA Std	2,500	2,720.58	6,801,450
Customer Charge		8,648.74	8,649
Subtotal			**11,470,099**
F/E Adjust	155.00	155.00	-
Fuel Charge	1,000,000.0	22.61	22,608,000
IPP Fixed Charge	2,500.0	424.14	1,060,350
IPP Variable Charge	1,000,000.0	0.42	420,000
Taxable Charges			35,558,449
GCT Charge		15.0%	5,333,767
Total Bill			**40,892,216**

Estimated New Bill			
MT70 STD	**Usage**	**Rate**	**Charges**
kWh Std	1,000,000	5.05	5,050,000
kVA Std	2,500	3,046.56	7,616,400
Customer Charge		9,857.33	9,857
Subtotal			**12,676,257**
F/E Adjust	155.00	155.00	-
Fuel Charge	1,000,000.0	20.30	20,304,000
IPP Fixed Charge	2,500.0	424.14	1,060,350
IPP Variable Charge	1,000,000.0	0.42	420,000
Taxable Charges			34,460,607
GCT Charge		15.0%	5,169,091
Total Bill			**39,629,698**
		Bill Impact ->>	**-3.09%**

7.4 Prepaid Tariff

For the 2023/24 regulatory year, JPS proposes its prepaid tariffs in keeping with the methodology and two-tiered rate structure applied in its previous submissions and OUR Determinations. JPS will revisit the structure of the prepaid rate at the 2024 Rate Application.

7.4.1 RT10 – Residential Prepaid Rates

Table 7-16 below shows the revenue analysis of the prepaid and post-paid rates assuming an identical revenue basket and billing determinants. As the table illustrates a variance can be seen up to 100 kWh because the existing lifeline tariff that is preserved.

Table 7-16: RT10 Prepaid Average Revenue Analysis vs. Post-paid – Two-Tiered Structure

Customer Bands	Customer Count	Test Year Demand (MWh)	Average Consumption	Post-paid Rate	Pre-paid Rate	Monthly Post-paid Revenue	Monthly Pre-paid Revenue	Monthly Variance	Annual Variance
0-50 kWh	142,469	21,683	13	59.94	17.22	111,014,694	31,893,110	-79,121,584	-949,459,008
50-100 kWh	120,789	97,847	68	18.86	17.22	154,909,477	141,439,087	-13,470,390	-161,644,680
100-200 kWh	214,323	348,130	135	18.37	18.37	531,510,324	531,510,324	0	0
200-300 kWh	83,623	237,535	237	21.60	21.60	428,082,862	428,082,862	0	0
300-400 kWh	29,733	121,600	341	22.90	22.90	232,182,024	232,182,024	0	0
400-500 kWh	11,769	64,505	457	23.65	23.65	127,199,940	127,199,940	0	0
500- 1000 kWh	14,866	108,307	607	24.19	24.19	218,282,384	218,282,384	0	0
>1000 kWh	1,858	89,893	4,032	25.61	25.61	191,856,188	191,856,188	0	0
						1,884,023,199	1,870,552,809	(92,591,974)	(1,111,103,688)

In keeping with the analysis above, JPS proposes the non-fuel prepaid rates for RT 10 customers as follows:

- $ 17.22/kWh for the first 117 kWh in a 30-day cycle; and
- $ 25.86/kWh for every kWh above 117 kWh in a 30-day cycle.

7.4.2 RT20- Small Commercial Prepaid Rates

The prepaid design for Rate 20 customers avoids the distortion and added complexity of the residential tariff. *Table 7-16* below shows the revenue analysis of the proposed prepaid tariffs for RT20 relative to the corresponding proposed post-paid rates. As can be seen no variance is observed as the difference between the two tariffs converges to zero.

For the 2023/24 regulatory period, JPS proposes the non-fuel prepaid rates for RT20 customers as follows:

- $ 151.93/kWh for the first 10kWh in a 30-day cycle; and
- $ 10.93/kWh for every kWh above 10kWh in a 30-day cycle.

Table 7-17: RT20 Prepaid Average Revenue Analysis vs. Post-paid – Two Tiered Structure

Customer Bands	Customer Count	Test Year Demand (MWh)	Average Consumption (kWh/month)	Post-paid Rate	Pre-paid Rate	Monthly Post-paid Revenue	Monthly Pre-paid Revenue	Monthly Variance	Annual Variance
(0-50] kWh	20,717	3,716	14.95	105.24	105.24	32,594,843.35	32,594,843.35	-	-
(50-100] kWh	8,493	8,784	86.19	27.29	27.29	19,976,598.47	19,976,598.47	-	-
(100-1000] kWh	31,592	152,847	403.18	14.43	14.43	183,798,698.74	183,798,698.74	-	-
(1000-7500] kWh	8,832	288,419	2,721.34	11.45	11.45	275,199,317.38	275,199,317.38	-	-
>7500 kWh	1,025	222,150	18,060.98	11.01	11.01	203,822,674.55	203,822,674.55	-	-
						682,797,289.14	**682,797,289.14**	-	-

8. Appendices

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Appendix B: US CPI

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