JPS | Powering What Matters

THE JAMAICA PUBLIC SERVICE COMPANY LIMITED

ANNUAL TARIFF ADJUSTMENT SUBMISSION FOR 2022

May 10, 2022

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 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' second annual rate adjustment 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 second Rate Review, it represents another year of the Company operating in a climate where its operations have been negatively impacted by the prevailing COVID-19 pandemic. Globally, countries grappled with the increase of new variants of the virus that resulted in the continuation of restrictions and closed borders in some cases.

JPS is also filing an Extraordinary Rate Review for several capital investment projects. Consequent upon the retirement of the Hunt's Bay B6 Unit and the anticipated impact on load centres in the Corporate Area, as well as the increased operation of GT10, JPS requested the OUR's approval of the two aforementioned project solutions for reactive support, and for maintaining grid stability. JPS, having received OUR's approval of these two projects in 2021 is applying for the incremental revenue requirement in an Extraordinary Rate Review application that will accompany this filing.

Additionally, JPS is seeking the approval of, and alignment on cost recovery for additional capital expenditure needed to maintain existing generating units (Rockfort unit#1, Rockfort unit #2, Hunts Bay GT5, Bogue GT3, Bogue GT6 and GT11) until the new 171.5MW replacement generation capacity enters service. The accelerated approval of US$10.96M is being requested to expedite critical maintenance activities needed to extend the life of several units beyond 2023. This includes expenditure of US$4.66M in 2023 and US$6.29M in 2024**. These projects are also included in the Extraordinary Rate Review. JPS is not requesting an incremental change to the revenue requirement to facilitate the Rockfort and Gas Turbine projects at this time.**

JPS recorded a total of 2,977 GWh in electricity billed sales for 2021. This represented an increase of approximately 1.4% relative to prior year. OUR's projection of 3,237 GWh for 2021 energy sales, as outlined in the Final Determination, represents a growth of approximately 8.7% when compared to 2021 actual performance.

The improvement in actual billed sales was driven by the growth experienced by large commercial and industrial customers as economic activity returned to some semblance of normalcy in key industries. Energy sales relative to the target performance as projected by the OUR for 2021 was similar with only a 0.6% variance or approximately 18 GWh less on aggregate.

With the gradual relaxation of containment measures in the latter part of 2021, electricity sales increased by 8% in the October to December quarter when compared to similar period for 2020.

The Planning Institute of Jamaica has estimated a growth in the overall economy within the range of 3% to 6% for the fiscal year 2022/23. This is predicated on the easing of CoVid-19 containment measures locally, as well as the further opening of the economies of Jamaica's main trading partners and overall general positive feedback in business and consumer confidence. The Jamaican economy should return to its pre-COVID-19 level of economic activity by FY2023.

Electricity is now 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 3,067 GWh, an increase of 3 percent relative to 2021.

BUSINESS PERFORMANCE

JPS continues to aggressively pursue stretched initiatives to manage the electrical system to enhance affordability, reliability and quality of service. 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.

JPS spent US$69.5M of the US$84.0M approved by the OUR in capital investments. The continued fall out from the global pandemic resulting in an operating environment that is hostile to project execution against plan continues to plague the projects and is the main driver for deviations from the plan. This was more evident as the Company faced difficulties in procuring key inputs such as conductors, insulators, poles and transformers as global supply chains were impacted by the pandemic. Approved planned outages which were required to carry-out critical work were also reduced in 2021 to minimize the inconvenience to customers who had to stay home as schools and work places were closed in response to the pandemic. While there was no direct government mandate to do this, JPS received several communications from leaders at the local level, requesting delays in planned outages due to the effect on school and work from home.

The table below outlines the Capital Investment projects by functions:

Function	2021 Actuals US$'000	2021 Budget US$'000
T&D	36,793	42,584
Generation	11,361	12,784
Losses	13,049	19,376
Digital	6,617	7,621
General Property	1,686	1,643
Grand Total	**69,506**	**84,008**

Improved reliability performance was realized from the successful completion of six major projects primarily aimed at grid modernization, expanding, upgrade and replacement of defective assets on the T&D Distribution 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 exceptional customer service and growth thus improving customer experience.

JPS continued its loss reduction efforts with major initiatives taking place on the distribution network. These included the continued execution of the Voltage Standardization Program (VSP). Two feeders that were converted from 12kV to 24 kV in 2020 realized technical losses reduction in 2021.

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. This project is the first of its kind in Jamaica and was commissioned in December 2021. The technical losses benefits to be derived from this project are expected to be realized starting in 2022.

With the support of these activities, resources and investments, JPS is confident that it will continue to improve its performance and provide safe, reliable and affordable electrical power to its customers. Finally, customers have considerably more options today to help manage usage as a result of JPS' investment in smart meter technology and prepaid infrastructure. These improvements require ongoing and sustained investment in the system.

PERFORMANCE FACTORS AND PROPOSED TARGETS FOR 2022

Paragraph 37 of Schedule 3 of the Licence stipulates that targets for losses, heat rate and quality of service 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 Regulator. Factor performance for 2021 is summarized below.

Quality of Service (Q-Factor) is a regulatory performance factor that attracts penalties and incentives that can impact JPS' revenues. The 2022 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.

The 2021 monthly SAIDI performance was generally better than the performance for 2016-2020. The reliability performance in August was the worst JPS has experienced over the previous five (5) years. This was due to the general adverse weather at that time of the year and well as the impact of Tropical Storms Grace and Ida, which resulted in broken poles, landslides and flooding, severely inhibiting JPS' ability to respond promptly to power outages. These storms had a combined impact of 674.9 minutes and 0.9 times contributing 36% of SAIDI and 11% of SAIFI 2021 Performance.

JPS' customers would have experienced a reduction in the frequency of outages (SAIFI) moving from an average of approximately nine (9) times in 2020 to eight (8) times in 2021. JPS' SAIFI performance is attributed to the benefits realized from its reliability improvement programmes. Customers, on the other hand, would have seen an increase in outage durations due to several factors to include the type, nature of the faults and logistics challenges imposed by the Covid19 pandemic.

The 2021-planned scope Distribution Structural Integrity project was to replace 2,400 distribution poles at an advanced stage of deterioration and rehabilitate 4,424 poles that were in less advanced stages of decay. The program also sought to replace ~ 10,900 insulators and 845 switches. At the end of 2021, JPS replaced 3,826 degraded distribution poles, rehabilitated 1,803 poles and replaced 9,820 insulators and 932 switches. The persistent bad weather resulting in flooding, lightning strikes and landslides across several parishes drove the need for emergency replacement of distribution structures. Through rehabilitation work, JPS customers were reconnected in a timely manner after forced outages. This program shielded customers from the negative effects of extended outages.

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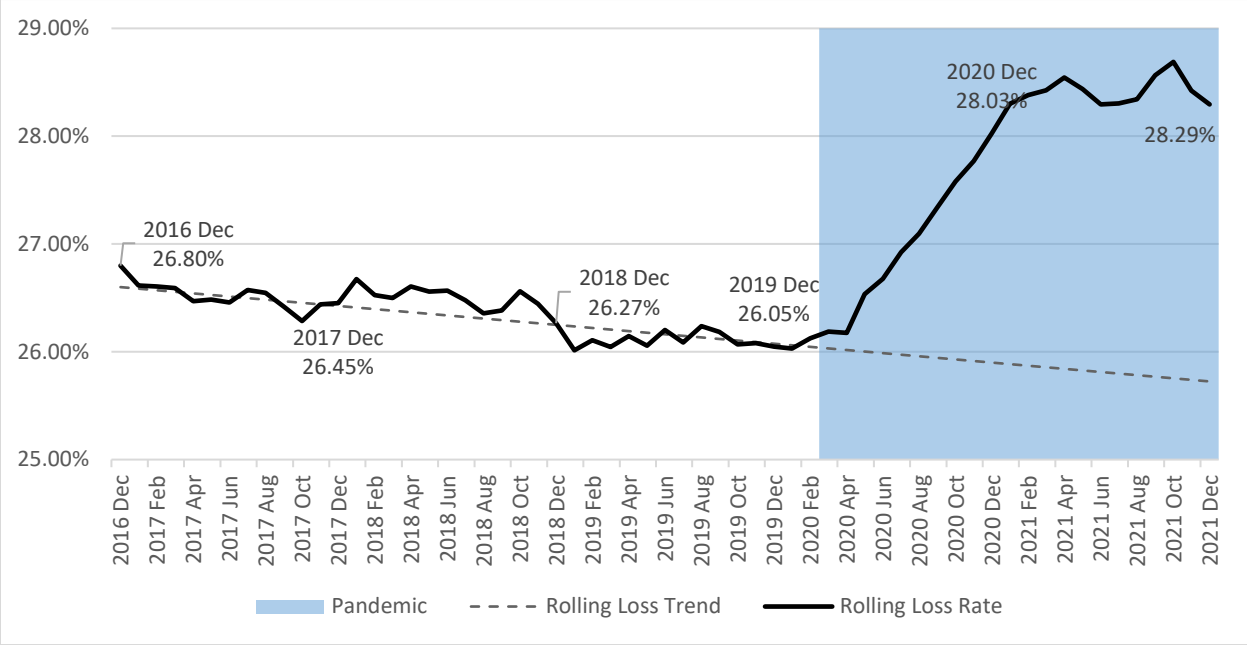
Despite the challenges faced by JPS due to various COVID-19 protocols, material shortages and shipping logistics delays - which in many cases curtailed planned work activities. For the year, JPS completed the conversion from 12 kV to 24kV of the three (3) distribution feeders emanating from the Blackstonedge and Highgate Sub Stations. This included the complete re-insulation of 322km of line, representing an 85% re-insulation level; the remaining 15% is scheduled to be completed by end of 1st quarter 2022. Grid Modernization Program was completed. The projections are that JPS will see a 24.6 minutes' reduction in SAIDI and 17.5 MWH reduction in unserved energy. For the period December 2021 and March 2022 JPS has measured 4.7 minutes' savings in SAIDI in the areas where the installations were done, which represents a 24% improvement. JPS expects this to grow to 24.6 minutes by the end of 2022.

System Losses (Y-Factor): System losses for 2021 stood at 28.29% representing an increase in performance when compared to pre-Covid years. The reversal in the downward losses trend is outlined in the table below and is an indication of the negative impact the pandemic has had on the country. One of the main drivers to the increase in losses is attributable to Non-Technical Losses (NTL). The utility has and continues to try different approaches to reduce theft but progress is slow and hard won. The pandemic has made it clear just how much of this is outside of the control of the utility. Despite the economic burden to the entire country, this continues to be a problem largely left to the utility to address it.



The pandemic also affected global supply chains, which in turn affected the availability of materials used in loss reduction activities. There were significant challenges particularly with securing smart and RAMI meters. This affected the RAMI and smart meter initiatives, which relied on the installation of new metering infrastructure. The shortage also affected routine audits particularly in cases where defective or damaged meters could not be replaced.

JPS continues to raise concerns regarding the OUR's reliance on the Energy Loss Spectrum (ELS) in setting targets for NTL. The Company, having proposed a more suitable alternative mechanism using the coverage of smart meters to characterize the level of control available to JPS, continues to advocate for this or a similar approach in verifying and agreeing the variables to be used in target setting.

JPS' plan to install 60,000 smart meters in 2021 were impeded primarily by factors relating to the pandemic. The main concern was the global supply chain issues, which resulted in shipment delays of several months for the meters. These delays have severely affected the deployment of smart meters with the bulk of installations occurring at the end of the year. As a result, JPS installed 47,631 smart meters in 2021.

Thermal Efficiency (H-Factor) - The JPS thermal heat rate for 2021 was 9,442kJ/kWh. When compared to 2020, this performance represents an improvement of 820kJ/kWh or 8%. The major contributors to this improvement were the retirement of Hunt's Bay B6 68.5MW steam turbine generator and the prudent maintenance activities carried out on the JPS generation assets. The monthly heat rate performance ranged from a high of 9,846kJ/kWh in January 2021 to a low of

9,294kJ/kWh in May 2021. The OUR target was changed in August from 9,675kJ/kWh to 9,667kJ/kWh.

The demand for electricity was for a second year disrupted across the island on account of the pandemic. In 2021, the country experienced its second lowest peak demand in five years and net generation 2.8% behind the pre-pandemic level of 4,429,475 GWh (2019). This low demand impacted JPS's utilization of its thermal generation assets, primarily the Bogue CCGT which is JPS' largest and most efficient generating asset.

Despite the Company's efforts in maintaining the CCGT in an efficient state, the low demand has caused a worsening of approximately 177kJ/kWh on the CCGT heat rate above its pre-pandemic performance of just above 9,000kJ/kWh. These are impactors outside of JPS' control that significantly affects the thermal heat rate performance.

2022 ANNUAL TARIFF ADJUSTMENT

2022 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 2021.

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 2022 Annual Revenue Target (ART) comprises the following:

- dI growth adjustment of 33.02% to the 2021 approved revenue cap of J$37.957B
- Volumetric performance adjustment of J$0.52B
- System losses performance adjustment of negative J$1.19B
- Foreign exchange surcharge of positive J$1.63B
- Net interest expense surcharge of negative J$0.50B
- Q-Factor Adjustment of negative J$0.95B

The proposed 2022 ART reflecting these adjustments is **J$51.3B**. In reviewing the proposed 2022 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 be reasonable and achievable.

The system losses target true-up applied for the 2021 is $1.19B in the proposed 2021 ART and the related tariff adjustment and bill impacts provided in Appendix D.

2. Extraordinary Rate Filing for 2021/2022 Capital Investment Projects

JPS proposes adjustment to its 2021 capital investment to account for the following projects that were approved by the OUR during the 2021/22 regulatory period:

- Capacitor Banks Project
- GT10 Hot Gas Path Inspection

Details of these projects are presented in JPS' Extraordinary Rate Filing and will see the ART of $51.3B being increased by an additional **$159M**

Proposed ART for 2022

2022 Annual Tariff Adjustment Summary	
Item	**Amount ($Million)**
Revenue Cap 2022	37,957
dI Adjustment (33.02%)	12,532
Revenue Cap 2022 (Adjusted for Growth – dl)	**50,489**
Performance Adjustments (note 1)	
Foreign Exchange Surcharge	1,628
Interest Surcharge	(50)
Volumetric kWh	196
Volumetric kVA	331
Customer Charge	(8)
System Losses	(1,190)
	907
Q Factor (0.25%)	**(95)**
All Adjustments	**13,345**
2022 Annual Revenue Target	**51,302**

REGULATORY MATTERS

The 2022 Annual Tariff Adjustment provides the Regulator with an opportunity to appreciate the Company's operational performance in 2021, 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, 2022. 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 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 revenues, 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:

IFRS16 Accounting Standard for Leases

The International Accounting Standards Board published the IFRS 16 - International Financial Reporting Standards referred to the treatment of Leases - in January 2016 with an effective date of 1 January 2019. The new standard requires lessees to recognise nearly all leases on the balance sheet including assets of Independent Power Producers (IPPs). The implementation of IFRS 16 has had a negative economic and financial impact on JPS.

In principle, the general implementation of IFRS rules is an obligation under the Licence. Condition 5 of the Licence establishes the accounting principles to be followed by JPS with Section 2 stating: *"The Licensee shall maintain such Regulatory Accounts as may reasonably be specified by the Office consistent with generally accepted accounting principles and the EA".*

JPS' IFRS 16's treatment of Leases is fully consistent with the Company's tariff methodology. The Licence establishes a tariff determination mechanism based on economic costs of the service as reflected in JPS financial statements. Paragraphs 27 to 33 of Schedule 3 of the Licence (the Revenue Requirement section) establish the revenue requirement to be estimated as RR = O&M + D + wacc*K + T.

The implementation of IFRS 16 therefore, implies a reduction in O&M costs and an equivalent (in net present values) increase in D and rK (interest payments.

JPS considers the inclusion of IPPs in its asset base an IFRS 16 rule change that would be eligible for a Z-Factor claim in keeping with the provisions set out in paragraph 46(d)(i) of Schedule 3 of the Licence which allows for a Z-factor percentage increase in the revenue cap, among others, due to:

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.*

All these conditions are met regarding past costs associated to the implementation of IFRS 16. Also, it is important that future IPP charges and other lease related costs are based on accounting costs and not on the actual payments to reflect the new situation. Consequently, JPS is requesting that the OUR adjust the rates to include the treatment of IFRS16 given the change in the rule and in the time profile of costs, and the need for JPS to ensure an efficient recovery of said costs.

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. Determination 24(b) states that *"Given the uncertainties associated with forecasting demand in light of the COVID-19 pandemic, the OUR shall revisit the demand forecast in the 2021 Annual Review with a view of fine-tuning the projections."* In JPS' view, Determination 24(b) is consistent with Paragraph 45 of Schedule 3 of the Licence which empowers the OUR to adjust the target billing determinants for known and measurable changes.

The OUR's energy forecast as per the 2019 Determination Notice of 3,237GWh was adjusted for known unregulated inclusions. The revised value is 3,147 GWh and represent a growth of approximately 5.7% relative to 2021 actual performance.

The OUR in the 2021 Annual Determination Notice outlined a rule based mechanism for revising demand forecast. This rule based mechanism arose out of discussions between JPS and the OUR. The Determination states:

1. *"JPS's Energy forecast would be accepted if the variance between that and the OUR's forecast for overall sales for the respective category is less than ±3%"*
2. *"The mean of the two Energy forecasts would be employed if JPS's forecasts deviate from that of the OUR's overall Energy forecast in each respective category by an amount greater than ±3%"*

JPS conducted analysis in keeping with the practice and the methodology used in the last annual review. Following the rules stated above, total energy sales is estimated to close the year at approximately 3,100 GWh, an increase of around 4.2%.

With the slow economic recovery, rise in oil prices and the resultant downward pressure on electricity sales due to conservation and other factors, JPS does not expect this level of electricity demand in 2022 especially against the outcome for 2021 where energy sales remained below 3,000 GWh, a level last seen during the economic downturn between 2011- 2012. Electricity sales performance since the start of the year has also been weaker than originally expected.

As per Paragraph 43 of Schedule 3 of the Licence, the Annual Revenue Target (ART) shall be adjusted on an annual basis, commencing July 1st of each year. A detailed analysis of the non-fuel tariff adjustment for 2022/2023 and the total bill impact for the typical JPS customer in each rate has been provided in Chapter 4. These rates shall be set to recover the ART requirement, given the target billing determinants (customer number, kWh energy sales, and kVA demand) for the year.

PROPOSED TARGETS FOR 2022

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 had significant challenges with the implementation of the 5% cap on Non Reportable outages as there was no defined mechanism established by the OUR as to how such cap ought to be applied. The challenge was also compounded by the varying impact each category of Rule Based Non-Reportable Outages had on the reliability performance, particularly in cases where it was observed that longer recorded duration non-reportable outages were in fact phantom outages (customers did not experience an outage).

JPS is proposing applying the 5% count cap on Non-Reportable Outages to rules 1, 3 & 4 only, as these extended outages were predominantly phantom with no interruption of supply to customers. Also, the inclusion of these outages in system reliability data set is not a true reflection of the system performance and would lead to an inappropriate allocation of resources to target real system reliability improvement.

Proposed adjusted targets for the other performance factors are as follows:

Heat Rate

Based on the heat rate performance obtained from JPS' updated forecasted model for July 2022 to June 2023, JPS' thermal heat rate is projected to finish at **9,589kJ/kWh (see table below)**. When compared to the current proposed regulatory target of 9,495kJ/kWh for the period, JPS' heat rate performance would be 94kJ/kWh worse than the target. This will yield a significant under-recovery of fuel costs over the period.

Results of JPS Forecasted Thermal Heat Rate Model, July 2022 to June 2023

Heat Rate (kJ/kWh)	22-Jul	22-Aug	22-Sep	22-Oct	22-Nov	22-Dec	23-Jan	23-Feb	23-Mar	23-Apr	23-May	23-Jun	Year
JPS Thermal (2022\23)	9,426	9,368	9,349	11,923	10,272	9,355	9,320	9,499	9,356	9,347	9,406	9,647	**9,589**

The Company is requesting a revision of the heat rate target with appropriate consideration given to the following:

1) The most recent operating key performance indicators (Heat Rate, Cap Factor, EFOR, EAF) of JPS key baseload units.
2) The direct and indirect effects of the COVID-19 pandemic on the load demand.
3) The 45 days planned outage of JPS most efficient unit (Bogue ST14).

4) The 28 days planned Hot Gas Path inspection on Bogue GT12.
5) The Rockfort units heat rate deterioration and low sulfur fuel impact.
6) A reasonable buffer to alleviate the impact that higher than planned forced outages on the IPP units have on JPS' heat rate performance due to the running of less efficient units (peakers) to maintain system reliability and minimize load shedding.

In keeping with the principle of FCAM, JPS is proposing that the JPS Thermal heat rate target for July 2022 –June 2023 be revised from 9,495kJ/kWh to **9,791kJ/kWh** to account for the impact of Bogue ST14 Major overhaul as well as the other known factors that continue to impact JPS' Thermal performance. The proposed target includes a small buffer for unplanned events not included in the forecast.

System Losses

JPS expects its initiatives to reduce non-technical losses by 53 GWh. The Company anticipates a demand of 4,387 GWh and sales of 3,180 GWh. Therefore, the Company is proposing the following losses targets for the 2022 calendar year. Consequently, JPS proposes the following targets for 2021 system loss as detailed in Chapter 6:

System Loss Component	Target(%)
Technical loss	*7.90*
Non-technical loss fully within the control of JPS	*6.89*
Non-technical loss not fully within the control of JPS	12.71
Total	**2750.00%**

RATE ADJUSTMENT AND BILL IMPACTS

Recovery of the proposed 2022 ART in the 2022/23 period requires overall non-fuel tariff increase adjustment of 6.6%. This required tariff increase is derived by applying across-the-board equal percentage increase to the current tariffs based on the 2022 actual billing determinants. It represents a movement of J$1.03 cents relative to 2021.

While the non-fuel tariff increase is requested at 6.6%, the associated total bill impact will be significantly smaller for all rate classes. This is because JPS non-fuel revenue requirement makes up only about one-third of the total revenue requirement, which also includes Fuel and IPP flow-through charges. JPS does not forecast any change to the Fuel and IPP charge components at this time.

2021 reflects the ART adjusted for movement in foreign exchange. This results in an average non-fuel rate of J$15.70. For 2022, JPS estimates an average non-fuel tariff of J$16.73 which represent an increase of 6.6%, a movement of J$1.03 cents relative to 2021. Overall, this would translate into an average bill impact of only 1.6%, inclusive of fuel and IPP charges (see table below)

Average Tariff and Bill Impact

CATEGORY	2021	2022
	2021	**2022**
ART J$"M	47,036	51,301
Energy Sales - Tariff Setting GWh)	2,996	3,067
Energy Sales - Actual	2,977	
Sales Growth		2.99%
Current Average Tariff		
Non-Fuel	**15.70**	**16.73**
Fuel Rate @March 2022	36.42	36.42
IPP Rate @ March 2022	12.39	12.39
Overall Rate	**64.51**	**65.54**
Rate Impact		
Non-Fuel		**6.55%**
Overall Rate		**1.59%**

Assuming no change in the current fuel prices and IPP rates, the total bill impact (will be an increase of approximately 1.6% for all customers.

Considering that JPS request equal percentage increase to the current non-fuel tariffs, the average bill impact by customer class will only differ depending on the weight of Fuel and IPP charges in those customers' bills and is expected to be in a similar range of 0.9% to 3.3%.

CONCLUSION

In summary, the 2022 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-19 on investment in the capital infrastructure, which have been brought forward to help improve services to customers, increase reliability, and support Jamaica's economic growth and expansion.
- Cost pressures attributable to uncontrollable factors, such as foreign exchange movements.
- The Russian-Ukraine war, the associated geopolitical tensions, and the spill-over effects into commodity and financial markets will also constrain economic recovery, slowing any progress that has been made over the past year as the world slowly lifted CoVid-19 restrictions.
- Lingering effects of the logistics and supply chain crisis is also expected to continue, further adding upward pressures on local and global prices.
- An inflation rate of 7.3%, which is noted to be higher than expected and outside of the upper end of its target for the year.
- The bulk of the expenditure within Jamaica's energy sector is denominated in United States Dollars. With US inflation also at record levels with an 8.5 percent recorded in March 2022 as reported by the Bureau of Labour Statistics, these adverse effects will also ripple through to customers via fuel and related costs.
- Globally fuel prices have risen sharply with oil prices surpassing the US$100 per barrel for the West Texas Intermediate (WTI) benchmark brought on by the effects of economic sanctions, a decline in output from Russia, and the ongoing uncertainties about potential supply and market disruptions because of the ongoing conflict.

Given these uncertainties and risks that exist within the global and local economy, JPS in accordance with the forward looking revenue cap mechanism reviewed the forecast for 2022 as approved by the OUR in the 2019 Final Determination. This is in keeping with section 17.58 of the 2019 Determination and the spirit of the methodology adopted in the 2021 Determination Notice.

1. PBRM Annual Adjustment

1.1 Introduction

The Electricity Licence 2016 dated January 27, 2016 was gazetted in February, 2016. The Licence shall hereafter be cited as the "Electricity Licence".

Paragraphs 1 and 2 of Condition 15 of the Electricity 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 Electricity 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 states 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 prescribes the methodology to be used in making an Annual Performance-Based Rate-Making Filing for Rates under the mechanism. Paragraphs 42 to 46 provides 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 Electricity 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 revenues, 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 2022 (RC_{2022})

The Electricity Licence describes the parameter RCy as the revenue cap for year "y" which should be established in the most recent Rate Review. The Electricity 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$37,957M for 2022 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 Electricity Licence to stay this determination and certain other determinations in the Final Determination until the outcome of the Licensees appeal, the revenue cap for 2022 is J$37,957M.

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 2021 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 33.02% 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 2022 of 22.7%, 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 2022 of 13.1%, derived from the U.S. Department of Labour statistical data[2] (see Appendix B);
- 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;

[1] Obtained from the Statistical Institute of Jamaica

[2] Obtained from U.S Bureau of Labor Statistics Website,

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 32.77% 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 Electricity Licensee. The Q-Factor adjustment factor is -0.25% and is detailed in Chapter 2; and

- The computed value of the Z-factor is 0%.

Table 1-1 below sets out the details of the computation of the growth rate, dPCI. and Table 1-2 shows the 2022 revenue cap adjustment for dPCI escalation factor.

Table 1-1: Escalation Factor

Annual Adjustment Clause Calculation			
ESCALATION FACTOR (dI) based on point to point data as at March 2022			
Line	Description	Formula	Value
L1	Base Exchange Rate		128.00
L2	Proposed Exchange Rate		155.00
L3	Jamaican Inflation Index		
L4	CPI @ Mar 2022		120.50
L5	CPI @ March 2019		98.20
L6	US Inflation Index		
L7	CPI @ Mar 2022		287.50
L8	CPI @ March 2019		254.20
L9	Exchange Rate Factor	(L2-L1)/L1	21.09%
L10	Jamaican Inflation Factor	(L4-L5)/L5	22.71%
L11	US Inflation Factor	(L7-L8)/L8	13.10%
L12	Escalation Factor (dI)	L9*{0.8+(0.8-0.0688)*L11}+(0.8-0.0688)*L11+(1-0.8)*L10	33.02%
L13	Q Factor		-0.25%
L14	Z Factor		0.00%
L13	**Escalation Factor net of Q and Z**	**dI + Q + Z**	32.77%

Table 1-2: 2021 Revenue Cap Adjustment

Computation of Revenue Cap for 2022			
L1	2022 Revenue Cap (as in Determination)		37,957,000,000
L2	dPCI (dI + Q + Z)		32.77%
L3	Adjusted RC $_{2022}$	L1 * (1+L2)	50,393,658,577

1.2.3 Foreign Exchange and Interest Surcharges

Paragraphs 31 and 53 of Schedule 3 of the Electricity 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:

$$SFXy{-}1 = AFXy{-}1 - TFX$$

$$SICy{-}1 = AICy{-}1 - TIC$$

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 Electricity 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, Criterion 1 of the Final Criteria 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 Electricity 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 2021 revenue requirement for FX losses and interest income:

- FX Losses (TFX): Of J$280M (paragraph 11.290) and when adjusted at the 2021 growth rate dI of 33.02%, the FX losses provision for 2021 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$422.5M and Expense/Income Annual Adjustment of J$50M (US$2.482M as per Tables 11.34 of the Final Determination and 4.4 of the Annual Determination). When adjusted for the approved 2021 growth rate (dI) of 16.16%, the approved TIC provision for 2021 is J$119.2M.

Paragraph 53 of Schedule 3 of the Electricity 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 2021 reflects the earned interest income consistent with the requirement in Schedule 3, Paragraph 53 of the Electricity 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 Electricity Licence, the FX loss incurred during 2021 reflect actual (realised) FX loss based on the incurred currency loss and gains.

Actual realised 2021 interest income in relation to interest charged to commercial and government accounts was J$372.5M offset by actual realized interest expense of J$265.5M paid on customer deposits, bank overdraft, interest expense and debt issuance costs. Actual late payment fees in 2021 were J$13.4M. FX losses in 2021 reflect realised currency losses of J$883.8M.

The AFX is computed as actual realised FX losses at the average exchange rate for 2021 of J$152: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 2021 are computed as illustrated in Table 1-3.

Table 1-3: Computation of FX and Interest Surcharges

FX and Interest Surcharge for 2021 (SFX_{2021} - SIC_{2021})			
Line	**Description**	**Formula**	**Value**
	FX Surcharge		
L1	TFX_{2021}		325,248,000
L2	AFX_{2021}		1,780,224,000
L3	**SFX_{2021}**	**L2-L1**	**1,454,976,000**
	Interest Surcharge		
L4	Actual net interest expense/(income) for 2021		150,690,064
L5	Actual Net Late Payment fees for 2021		13,409,440
L6	AIC_{2021}	L4+L5	164,099,504
L7	TIC_{2021}		119,189,453
L8	**SIC_{2021}**	**L6-L7**	**44,910,051**
L9	**SFX_{2021} - SIC_{2021}**	**L3-L8**	**1,410,065,949**

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 Electricity Licence. These true-ups reconcile JPS' actual performance during 2021 against the targets set for that year, and result in a J$539 Million reduction to the Annual Revenue Target (ART) for 2022. 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 Electricity 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 2021 were approved in paragraph 6.114 of the 2021 Annual Determination as shown below:

- Energy sales: 2,995 GWh
- Billing demand: 5,345,186 kVA
- Customer forecast: 689,437

The total revenue that would be generated by the tariffs approved in the Final Determination multiplied by the approved billing determinants is J$44.57B as shown in the table below.

Table 1-4: Expected Revenue Target (J$): 2021

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	3,938,556,533	4,012,264,459	-	-	-					7,950,820,992
Rate 10	LV > 100	-	12,219,665,176	-	-	-					12,219,665,176
Rate 20	LV	950,509,505	5,059,377,469	-	-	-					6,009,886,974
Rate 40	LV - Std	171,358,790	3,970,424,183	-	-	-	6,135,944,755				10,277,727,728
Rate 40	LV - TOU	10,739,891	-	271,482,051	251,093,882	73,012,569		91,218,268	326,516,213	357,555,173	1,381,618,046
Rate 50	MV - Std	12,082,377	859,683,892	-	-	-	1,335,969,648				2,207,735,917
Rate 50	MV - TOU	2,205,513	-	81,641,782	82,460,584	29,801,590		53,908,260	150,347,799	155,094,755	555,460,283
Rate 70	MV -STD	1,917,838	879,586,696	-	-	-	1,968,952,684				2,850,457,218
Rate 70	MV -TOU	383,568	-	97,016,816	85,545,681	28,730,387		34,715,313	103,974,240	140,071,306	490,437,310
		12,257,135	6,953,597								19,210,732
TOTAL		5,107,280,363	27,612,768,294	450,140,649	419,100,146	131,544,545	9,440,867,086	179,841,840	580,838,252	652,721,235	44,575,102,410

This is not exactly equal to the approved revenue cap for 2021 of J$44.578B as stated in Determination 1. To 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 be the approved revenue cap (shown in Table 1-5 below).

Table 1-5: Corrected Approved Revenue Target: 2021

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	3,938,885,054	4,012,599,128.80	-	-	-					7,951,484,183
Rate 10	LV > 100	-	12,220,684,438	-	-	-					12,220,684,438
Rate 20	LV	950,588,788	5,059,799,480	-	-	-					6,010,388,268
		-	-	-	-	-					-
Rate 40	LV - Std	171,373,083	3,970,755,363	-	-	-	6,136,456,564	-	-	-	10,278,585,010
Rate 40	LV - TOU	10,740,786	-	271,504,695	251,114,826	73,018,659	-	91,225,876	326,543,449	357,584,998	1,381,733,289
Rate 50	MV - Std	12,083,385	859,755,600	-	-	-	1,336,081,083	-	-	-	2,207,920,068
Rate 50	MV - TOU	2,205,697	-	81,648,592	82,467,462	29,804,076	-	53,912,756	150,360,340	155,107,692	555,506,615
Rate 70	MV -STD	1,917,998	879,660,064	-	-	-	1,969,116,917	-	-	-	2,850,694,979
Rate 70	MV -TOU	383,600	-	97,024,909	85,552,816	28,732,783	-	34,718,208	103,982,913	140,082,990	490,478,218
		12,258,157	6,954,177	-	-	-					19,212,335
TOTAL		5,107,706,370	27,615,071,520	450,178,196	419,135,104	131,555,518	9,441,654,564	179,856,841	580,886,701	652,775,679	44,578,820,493

Using these adjusted revenues as the basis, the Non-fuel Energy, Customer Charge and Demand revenues targets used in the volumetric true-up for 2021 are calculated as shown in Table 1-6 below:

Table 1-6: Approved Revenue Target: 2021

Component of Target	J$M
Revenue Target for Energy	28,616
Revenue Target for Demand	10,855
Revenue Target for Customer Charges	5,108
2021 Approved Revenue Cap (as in Determination)	44,579

As illustrated in, TUVol Table 1-7 2021 is determined by substituting the values computed in Table 1-6 above. The 2021 volumetric adjustment is a J$464M increase in the ART before WACC adjustment.

Table 1-7: Computation of Volumetric Adjustment

Volumetric Adjustment $TUVol_{2021}$			
Line	**Description**	**Formula**	**Value**
	Energy Surcharge		
L1	kWh $Target_{2021}$		2,995,809,473
L2	kWh $Sold_{2021}$		2,977,423,181
L3	Revenue Target for Energy		28,615,940,338
L4	kWh Surcharge	(L1-L2)/L1*L3	175,625,665
	Demand Surcharge		
L5	kVA $Target_{2021}$		5,345,186
L6	kVA $Sold_{2021}$		5,199,352
L7	Revenue Target for Demand		10,855,173,786
L8	kVA Surcharge	(L5-L6)/L5*L7	296,164,471
	Customer Count Surcharge		
L9	#Customer Charges $Target_{2021}$		689,437
L10	#Customer Charges $Billed_{2021}$		690,403
L11	Revenue Target for Customer Charges		5,107,706,370
L12	Customer Charges Surcharge	(L9-L10)/L9*L11	(7,158,761)
L13	**$TUVol_{2021}$**	**L4+L8+L12**	**464,631,375**

1.2.4.2 System Losses Adjustment

As stated in the Electricity 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 Electricity 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 Electricity 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 2021:

a) Technical Losses (TL) Target: **7.72%**
b) Non-Technical Losses within the control of JPS (JNTL) Target: **4.58%**
c) Non-Technical Losses not fully within the control of JPS (GNTL) Target: **11.50%**
d) 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 Electricity Licence, these targets remain as the approved targets from the OUR unless JPS is successful in its pending appeal of the OUR's decision.

Detailed discussion of the system losses performance in 2021 and JPS' position and proposal with respect to the system losses targets adjustment is provided in Chapter 5. This chapter also includes JPS' response to Determination #21, which requires JPS to submit with reasonable accuracy, the specific sources and distribution of the energy losses for all the NTL categories, supported by the associated reports and details of the field investigations and analyses.

Using these targets and the actual system losses performance for 2021, the system losses penalty is $1.064B as shown in Table 1-8 .

While JPS included system losses penalty in the 2022 ART in this application, JPS believes that the system losses targets were set at the height of COVID-19 pandemic, are not reasonable and achievable, and therefore inconsistent with the requirements of paragraph 37 of Schedule 3 of the Electricity Licence.

Table 1-8: Computation of TULos2021

System Losses Adjustment TULos 2021			
Line	**Description**	**Formula**	**Value**
L1	Actual TL_{2021}		7.91%
L2	Target TL_{2021}		7.72%
L3	Ya_{2021}	(L2-L1)	-0.19%
L4	Actual $JNTL_{2021}$		6.25%
L5	Target $JNTL_{2021}$		4.58%
L6	Yb_{2021}	(L5-L4)	-1.67%
L7	Actual $GNTL_{2021}$		14.13%
L8	Target $GNTL_{2021}$		11.50%
L9	RF		20.00%
L10	Yc_{2021}	(L8-L7)*L9	-0.5260%
L11	Y_{2021}	L3 + L6 + L10	-2.39%
L12	ART_{2021}		44,578,820,493
L13	**$TULos_{2021}$**	**L11*L12**	**(1,063,650,657)**

2. Q-Factor Adjustment

2.1 Introduction

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

At each Annual Review during a revenue cap period, the OUR is required to measure JPS' annual quality of service performance for each year during the said revenue cap period, versus the annual target set in the 5-Year Rate Review Determination Notice. This is in order 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 vetted 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 OUR approved Q-Factor annual targets for the 2021-2022 Rate Review period, as outlined in the 2019-2024 Rate Review Determination. The annual reliability targets for the 2022 Tariff Adjustment Filing to be applied to the 2021 outage dataset are as follows:

- SAIDI: 1,408.0 minutes
- SAIFI: 11.7 times
- CAIDI: 120.2 minutes

The 2022 Rate Adjustment Filing is the second year for the application of the Q-Factor mechanism. The application for the 2020-2021 filing was set to zero. Hence, 2021-2022 will be the first year that the Q-Factor mechanism will be applied, based on JPS' reliability performance against the OUR established annual targets.

The performance to be measured against the OUR targets are highlighted in Table 2-1 below:

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

Outage Data	Description	Target SAIDI	Target SAIFI	Target CAIDI
2016-2018	**BASELINE**	**$SAIDI_{Base}$(1,582)**	**$SAIFI_{Base}$(12.9)**	**$CAIDI_{Base}$(122.7)**
2019	2020 -2021 Annual Review	No Pre-set Target	No Pre-set Target	No Pre-set Target
2020	2021 -2022 Annual Review	$SAIDI_{Base}$*(1-0.05)	$SAIFI_{Base}$*(1-0.04)	$CAIDI_{Base}$*(1-0.01)
2021	**2022-2023 Annual Review**	**$SAIDI_{Base}$*(1-0.11)**	**$SAIFI_{Base}$*(1-0.09)**	**$CAIDI_{Base}$*(1-0.02)**
2022	2023-2024 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 the JPS' annual Q-Factor performance, during the Rate Review Period, encompasses the following activities:

i. Assessment of JPS' system reliability performance for 2021 in terms of power outages on the Transmission and Distribution (T&D) network, resulting in supply interruptions to customers.
ii. Analysis of outage causes to determine the main drivers of electricity supply interruptions and the focus of JPS' reliability improvement strategies.
iii. Derivation of the defined reliability indices and Determination of the Q-Factor applicable to the Revenue Cap for the reporting year.

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

i. SAIFI – System Average Interruption Frequency Index
ii. SAIDI – System Average Interruption Duration Index
iii. CAIDI – Customer Average Interruption Duration Index
iv. 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:

i. Above Average Performance (greater than 10% below target) – worth 3 quality points on either SAIFI, SAIDI or CAIDI;
ii. Dead Band Performance (within ±10% of target) – worth zero (0) quality points on either SAIFI, SAIDI or CAIDI; and
iii. 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 has not recognized the exclusion of the 2.5beta methodology events for Major Event Days, these were not excluded from the JPS annual reliability performances.

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

i. For each Annual review application during the Rate Review period, JPS shall include an outage cause analysis to support its Q-Factor proposal.

ii. 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.

iii. 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.

iv. 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.

v. The Status/progress of reliability projects being implemented.

2.2 JPS' Reliability Performance 2021

For the 2022 Annual Review Filing, JPS submitted that the overall system 2021 reliability performance for 2021 was evaluated using the 2021 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 convenience, comparable figures for 2019-2020 are also provided.

Table 2-2: JPS Reported System Reliability Performance for 2021

JPS REPORTED 2019 & 2021 SYSTEM RELIABILITY PERFORMANCE					
YEAR	**# Reportable forced outages**	**SAIDI (mins/customer)**	**SAIFI (interruptions/customer)**	**CAIDI (mins/interruption)**	**MAIFI (interruptions/customer)**
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

JPS' 2021 performance constitutes forced, sustained, and reportable outages and 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 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	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), the format for reporting reliability indices, should exclude Force Majeure (FM) events along with the various outage classes. This position is supported by Condition 11(2) of the Electricity Licence, 2016 which excuses JPS' non-compliance caused by Force Majeure. During the period under review, Tropical Storms Ida, Elsa and Grace (as classified by the Meteorological Service of Jamaica) materially and adversely affected JPS' performance. These events had a material financial exposure of US$650,000.00 associated with a penalty equivalent of – 3 quality points under the Q-Factor mechanism, in addition to JPS' inability to recover sums expended to restore the Network, same not reaching the trigger threshold stipulated to access the Electricity Disaster Fund. JPS therefore recommends that these events be excluded from the Q-Factor evaluation pending the Minister's approval of the classification of the 2021 Tropical Storms Force Majeure events.

With the exclusion of Force Majeure events, JPS has performed 42% and 16% better for SAIFI and SAIDI respectively, and 46% worse for CAIDI, when compared to the established Q-Factor targets. This would result in a quality point of +3.

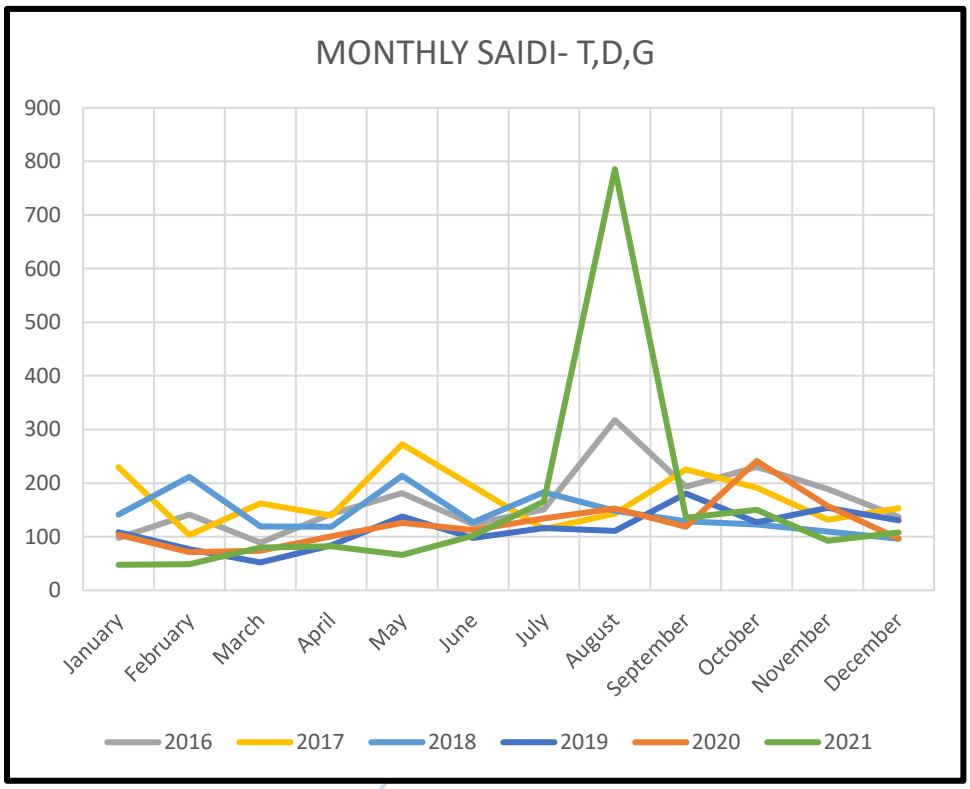
However, with Force Majeure included, JPS performed 34% better for SAIFI, and 32% and 102% worse for SAIDI and CAIDI respectively, when compared to the established Q-Factor targets, which resulted in a quality point of -3.

JPS' customers would have experienced a reduction in the frequency of outages (SAIFI) moving from an average of approximately nine (9) times in 2020 to eight (8) times in 2021. JPS' SAIFI performance is attributed to the benefits realized from its reliability improvement programmes outlined in Table 2-8. Customers, on the other hand, would have seen an increase in outage durations due to several factors to include the type, nature of the faults and logistics challenges imposed by the Covid19 pandemic. Additionally, JPS experienced three (3) major tropical storms, namely: Grace, Ida, and Elsa, which contributed 36% to the annual SAIDI performance.

2.2.1 SAIDI Performance

Figure 2-1, provides SAIDI reliability performance for 2021 broken out by month against the baseline.

Figure 2-1: SAIDI Performance in 2021 (include Generation, Transmission and Distribution)



The 2021 monthly performance was generally better than the performance for 2016-2020. The reliability performance in August was the worst JPS has experienced over the previous five (5) years. This was due to the general adverse weather at that time of the year and well as the impact of Tropical Storms Grace and Ida, which resulted in broken poles, landslides and flooding, severely inhibiting JPS' ability to respond promptly to power outages.

2.2.2 SAIFI Performance

Figure 2-2, provides SAIFI reliability performance for 2021 broken out by month against the baseline.

Figure 2-2: SAIFI Performance in 2021 (include Generation, Transmission and Distribution)

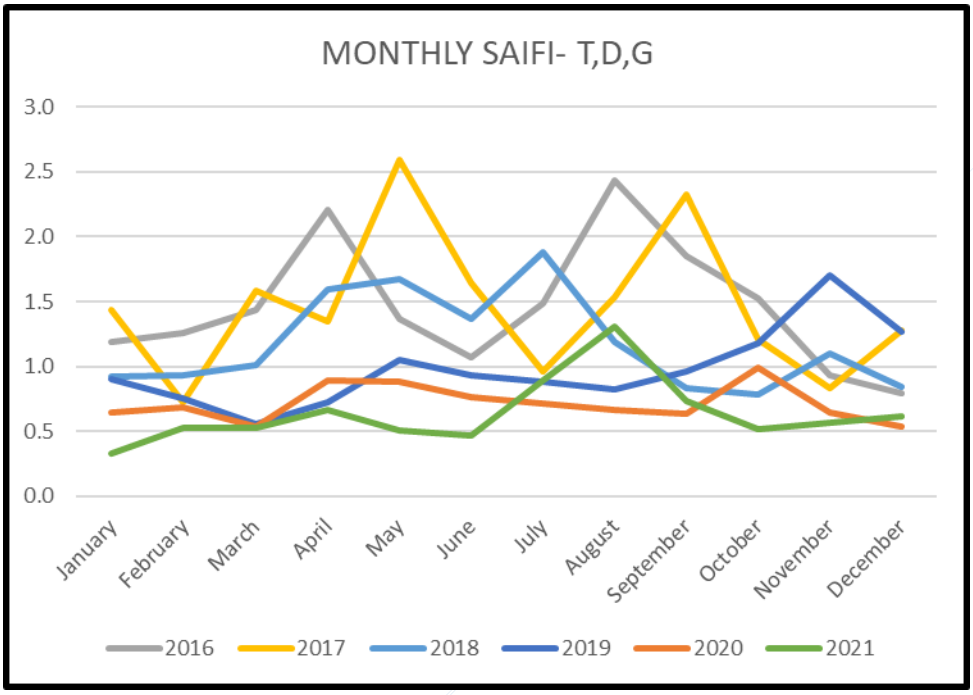
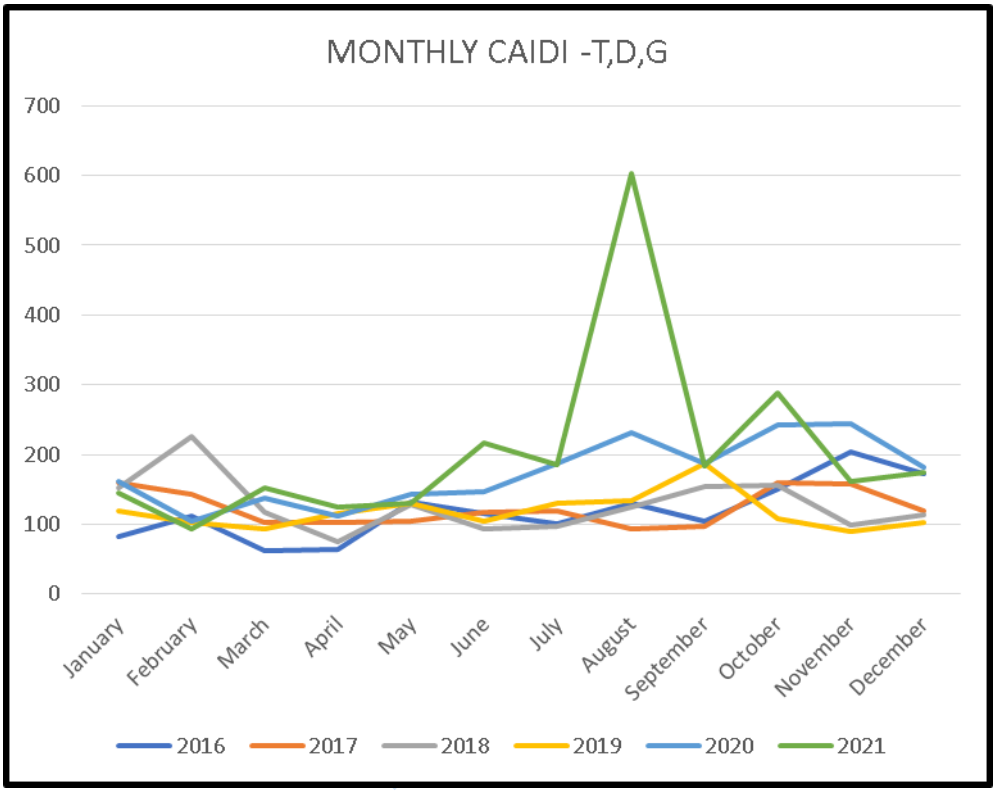


Figure 2-2 shows that the 2021 monthly performance was generally better than the previous five (5) years, except in the months of July to August, where historically the Company has seen increases in frequency of outages due to the adverse weather conditions. A similar trend was seen in 2021, along with the occurrences of the Tropical Storms Grace, Ida and Elsa in the above-mentioned months. The adverse weather conditions during this time of the year usually results in a high frequency of outages relating to equipment failures and vegetation.

2.2.3 CAIDI Performance

CAIDI is derived from SAIDI and SAIFI indices. Figure 2-3, provides CAIDI reliability performance for 2021 broken out by month against the baseline.

Figure 2-3: CAIDI Performance in 2021 (include Generation, Transmission and Distribution)



CAIDI performance in 2021 was generally worse than the previous five (5) years. This was because the nature of outages experienced were more labour intensive. While the team responded within the requisite time, the overall restoration times were negatively impacted by the wrench time required to resolve these faults. Though the CAIDI shown, in figure 2.3 is derived, it must be noted that the restoration time generally is a function of the utility's own ability and the nature of the restorative works being performed. With the exceptional performance of the SAIFI index, based on the derivation, this has an adverse impact on the derived index CAIDI. Note that CAIDI is a derived factor and the adverse CAIDI, is computed specifically by the formula below and not a true indication of the average response time but the average restoration time:

$$CAIDI = \frac{SAIDI}{SAIFI} \ (mins)$$

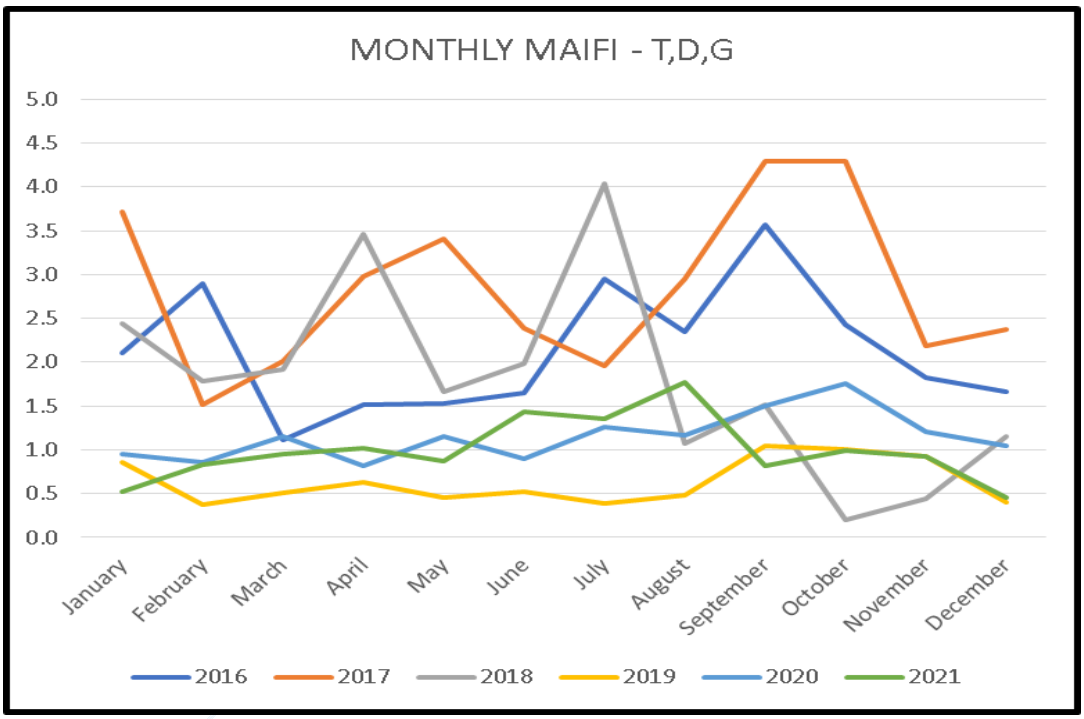
It should be noted, that as the health of the grid improved, by eliminating the bulk of the frequent fault drivers, faults on the system will be driven more by heavy lift structural failures, not addressable only by a simple response.

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 decreased significantly (13 percent) in 2021 compared to 2020, based on Table 2-2 indicating an improvement in performance over the period.

Figure 2-4 : MAIFI Performance in 2021 (incl. Generation, Transmission and Distribution)



There was a rise in MAIFI during June and August, primarily due to an increase in feeder cycling events associated with severe weather by the three tropical storms. Although the largest cause contributor to MAIFI, was described as “unknown”, the correlation lies with majority of the MAIFI contribution happening in the months of June to August (38% contribution). Corresponding to the usual adverse weather events associated with the hurricane season. Because the ABB/Ventyx OMS was not designed to ascertain the drivers/causes of momentary 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 2021-2022 Annual review is summarized in *Table 2-4* below:

Table 2-4: Q-factor Adjustment for 2021 Performance

SAIDI (min/customer)		SAIFI (interruptions/customer)		CAIDI (min/customer)		
Variance	Quality Points	Variance	Quality Points	Variance	Quality Points	Total Quality Points
16%	3	42%	3	-46%	-3	3

Due to adverse weather conditions experienced and the resulting impact on the JPS network, JPS will be submitting an application for the Force Majeure to MSET based on the Electricity Licence, 2016. With the approval of the three Force Majeure events, JPS will be incentivised based on total quality points of three (3) for its 2021 performance. Hence, JPS proposes a Q-Factor adjustment of 0.25% for the 2021 annual rate review.

2.2.6 Non- Reportable Forced Outages

Industry best practice has shown that with the acquisition of any Outage Management System (OMS), there will be inherent limitations in its application, necessitating post calibration of outage data to accurately account for true/real outages impacting customers. Since JPS' implementation of its OMS in 2013, it too had to implement a daily processes for outage validations and data calibration. Data calibration is performed when the characteristics of outages are abnormal, validated by field observations. To appropriately classify and address abnormal outages, a Rule-Based Data Dictionary approved by the OUR was created. These rules are as follows:

i. Excessive customer count & OMS/GIS Glitches
ii. Non-Utility related outages
iii. Incorrect customer to device mapping
iv. Operator error

From 2016 to 2021, JPS Non-Reportable outages averaged approximately 8.0%, as indicated in *Table 2-5* below:

Table 2-5: Non-Reportable Outages (2016-2021)

YEAR	Total # of Forced Outages	# of 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	61828	8304	13.4%
Average	**62,822**	**5,001**	**8.0%**

JPS had significant challenges with the implementation of the 5% cap on Non Reportable outages as there was no defined mechanism established by the OUR as to how such cap ought to be applied. The challenge was also compounded by the varying impact each category of Rule Based Non-Reportable Outages had on the reliability performance, particularly in cases where it was observed that longer recorded duration non-reportable outages were in fact phantom outages (customers did not experience an outage).

Table 2-6 shows the breakdown of Non-Reportable outages by modality and the percentage contribution:

Table 2-6: Breakdown of Non-Reportable forced outages

Rule	Rule 1 – Excessive Customer Count	Rule 2 – Non-Utility Related Outage	Rule 3 – Incorrect Customer to Device Mapping	Rule 4 – Operator Error
# of Outages	1,220	2,988	2,503	1,593
% of Total Count Non-Reportable Outages	14.7%	36.0%	*30.1%	19.2%
SAIDI (Minutes)	451.26	10.5	68.17	944.25
SAIFI (Times)	1.34	0.03	0.12	2.81

(*Due to OMS/GIS integration glitches)

As illustrated in the table above the main drivers in the count of Non-Reportable outages are Non-Utility related outages which account for 36% of all Non-Reportable forced outages. Identifying the cause of the 2,988 outages that contribute to this Calibration Rule, it was observed that these (1,410 outages) were due to customer premises being locked or not found, 20% (613 outages) due to disconnection and 23% (690 outages) was due to defective customer equipment. While this category was the highest count, it was also noted that in some instances customer did in fact experience an outage, albeit the outage or the extent of same was not directly related to JPS. Additionally, the contribution to reliability performance was negligible (10.5 minutes). On the other hand, the Company observed the utility related Non-Reportable Outages showing the greatest reliability impact; combination of rules #1, 3 & 4 contributing 1,463.68 SAIDI minutes. These long-duration recorded outages were primarily phantom outages driven by operator error (such as incomplete tagging of manual load transfers and excessive customer count over and above the capability of associated transformers).

JPS is proposing applying the 5% count cap on Non-Reportable Outages to rules 1, 3 & 4 only, as these extended outages were predominantly phantom with no interruption of supply to customers. Also, the inclusion of these outages in system reliability data set is not a true reflection of the system performance and would lead to an inappropriate allocation of resources to target real system reliability improvement.

Initiative to reduce the number of Non-Reportable Forced Outages

The installation of the new OSI Electra OMS will significantly improve the accuracy of the daily customer count and customer to transformer electrical connectivity, due to the seamless integration with the GIS system and SCADA. This will result in a progressive reduction in the number of non-reportable outages due to excessive customer count and the need to perform manual load transfer in the OMS. Additionally, with the capability of the new Open Systems International (OSI) OMS to integrate with smart meters, significant improvement should be seen in Rule 3 - *Incorrect customer-to-device mapping.* Importantly, these meters have the capability to be "pinged" so that their location can be tracked, and mapped relative to the transformer. A significant reduction is expected in the Rule 4 - *Operator Errors,* as there will be the elimination of a number of duplicated outages, previously caused by primary outages producing duplicated secondary outages.

Further benefits will be realized with treatment of Non Reportable outages as shown in *Table 2-6*.

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 E – Outage Drivers 2021" in its submission. *Table 2-7* shows the reliability outage drivers and their respective contributions to SAIFI and SAIDI:

Table 2-7: Outage Driver Contribution to SAIFI and SAIDI

Primary Cause	% Contribution to SAIFI	% Contribution to SAIDI
Equipment Failure	32%	30%
Unknown	23%	23%
Vegetation	15%	24%
Public Error	9%	6%
Lightning	5%	10%
Power Supply	7%	1%
Other	5%	5%
Wild Life	3%	1%
Contamination	1%	1%

Table 2-7 shows that Equipment Failure, Unknown and Vegetation were the main outage drivers for 2021. Equipment failure is largely due to the impact of the three major tropical storms as highlighted earlier. Through the Structural Integrity programme, JPS will target those assets in the worst condition for replacement and rehabilitation.

In addressing the large number of outages caused by "Unknown" drivers, JPS has integrated more measures in the new OMS in order for the data to quantify causes. Relating outages to their root cause is an ongoing measure to improve reliability, thus, JPS would like to emphasize that efforts are being increased to reduce "Unknown" related outages. Such efforts 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.
- Post outage inspection to ascertain actual cause and update in OMS.

2021 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 are outlined below:

Table 2-8: Project completion status for reliability projects

Reliability Impacting Projects	OUR approved CAPEX (US$' 000)	Project Completion Status
Voltage Standardization Programme	$ 3,196	100% Conversion from 12 kV to 24kV of the three (3) distribution feeders emanating the Blackstonedge and Highgate Sub Stations. Completed re-insulation of 322km of line. This represents an 85% re-insulation level; the remaining 15% is scheduled to be completed by end of 1st quarter 2022. Deferred due to material shortage caused by global logistical challenges

Reliability Impacting Projects	OUR approved CAPEX (US$' 000)	Project Completion Status
Grid Modernization Programme	$ 2,299	Scope Completed
Distribution Structural Integrity	$ 4,564	Scope Completed
Distribution Line Re-Conductoring and Relocation	$ 2,124	Program was 70 % completed due to material unavailability caused by global logistical challenges brought on by the pandemic. Programme scope deferred to 2022
Transmission Structural Integrity	$ 1,870	Scope Completed
Substation Structural Integrity	$ 1,722	Equipment such as circuit breakers and reclosers, which were scheduled to be replaced in 2021 were not replaced as Materials and equipment were damaged in a major Warehouse fire in Kingston. Replacement material and equipment procurement were further affected by the effects of Covid-19 on global material availability and shipping logistics. Thus replacements were deferred to the following year
Distribution Transformer Replacement/Upgrade Program	$ 2,203	Tredegar Upgrade Completed Parnassus - 12% completed and Spur Tree - 12% completed. The projects were delayed due to shipping logistical issues brought on by the pandemic, absenteeism due to the Covid-19 pandemic (locally & overseas), therefore a loss in manpower due to ailment and delay due to NEPA Approval for the Parnassus project. Due to the pandemic there was a delay in the delivery of the Parnassus Transformer. The projects are to be completed in August 2022
Grand Total	**$ 17,978**	

The COVID-19 pandemic was not only a global health crisis, but it had altered the way JPS operated as a utility. Despite the challenges faced by JPS due to various COVID-19 protocols, material shortages and shipping logistics delays - which in many cases curtailed planned work activities, JPS has been tactical in implementing all but three projects. These projects were deferred until 2022 due to significant supply chain challenges posed by the COVID-19 pandemic. The Capital Investment Chapter provides further details on the scope and benefits of these projects, as well as comments on the Distribution Line Re-Conductoring and Relocation Programme, Voltage Standardization Programme, and Substation Structural Integrity Programme. Routine maintenance, such as integrated vegetation management and other diagnostic activities, has substantially aided efforts in these reliability improvement projects.

2.3 Challenges in 2021

Covid-19 Pandemic

Ensuring the continuity of critical services is now an unprecedented challenge in the face of a global pandemic. During the above-mentioned period, the COVID-19 pandemic has altered the mode of operation of the utility. Some issues imposed on the utility are as follows:

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

Tropical Storms Elsa, Grace and Ida

Tropical Storms Elsa, Grace and Ida experienced July 2nd-6th, August 17th-19th and August 26th-27th respectively, had a major impact on JPS' electrical network resulting in numerous power outages across the island. The severity of weather conditions also hindered restoration efforts that were vastly impacted by flooding, landslides and damaged equipment. These storms had a combined impact of 674.9 minutes and 0.9 times contributing 36% of SAIDI and 11% of SAIFI 2021 Performance.

Public Interference

JPS has been dealing with outages that are out of the utility's control, and one such instance is due to "Motor Vehicle Accident". JPS has been monitoring the possible implication that the secondary cause outage "Motor Vehicle Accident" has been having on the reliability performance. As at 2021, Motor Vehicle Accidents have contributed to 4% of the overall reliability performance, resulting in corresponding SAIDI and SAIFI values of 80.7 minutes and 0.5 times. Table 2-9 summarizes the Vehicle Accident contribution to reliability performance:

Table 2-9: Vehicle Accident contribution for 2021 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**

Customers would have experienced an increase in outage durations of 10% when compared to 2020 due to the above-mentioned secondary cause. These outages, along with others caused by public interference are usually outside of the control of the utility. Hence, JPS will seek to apply for exemption/exclusion, based on the provision in the Electricity Licence, 2016.

2.4 Reliability Performance Outlook for 2022 (Initiatives)

Ensuring a reliable supply of electricity is critical to guaranteed continuity of residential and commercial activities in Jamaica's energy landscape. Achieving JPS' strategic goals requires continuous and sustainable investments in the electricity system to deliver greater efficiency and

improved service to JPS' customers. In addition to investing in the network, JPS also wants to improve customer communication and provide more options and control. Accordingly, JPS will continue to expand its digital platform to make doing business with its customer base as easy as possible.

Some of the over-arching objectives for 2022 are to:

- Reduce the frequency of outages through grid modernization.
- Reduce the average duration of forced outages through the improved capability of the new OSI OMS.
- 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.
- Review and where necessary, 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.

Table 2-10 summarizes the capital investment for reliability projects JPS will be undertaking in 2022:

Table 2-10: Capital Investment for 2022 Reliability Projects

Reliability Projects	OUR Approved CAPEX ($US' 000)
Voltage Standardization Programme	4165
Grid Modernization Programme	2,410
Distribution Structural Integrity Programme	4,763
Distribution Line Reconditioning and Relocation	2,037
Transmission Structural Integrity Programme	1,858
Substation Structural Integrity Programme	1,798
Grand Total	**17,031**

New Outage Management System

Installed in 2013, the ABB/Ventyx OMS has reached the end of life for both OMS applications and hardware platforms, posing serious cyber security and maintenance risks due to the possibility of system failure and frequent shutdowns. Additionally, this system has limited integration capabilities with other critical operational and enterprise systems such as SCADA and the Advanced Metering Infrastructure/Metering Data Management System (AMI/MDMS).

Furthermore, standalone OMS have been deprecated over time as more utilities implement Advanced Distribution Management Systems (ADMS) solutions, according to industry trends. In order to mitigate these risks, JPS is required to migrate from the outdated Ventyx OMS system to a fully integrated OMS solution on a common platform with the existing SCADA/DMS system. The new Electra OMS is a key tool that allows JPS to consolidate all its individual Smart Grid initiatives aimed at managing outages.

- **Unforeseeable Challenges with the new OMS**

With reference to the Bathtub Curve principle which is widely used in reliability applications, KPI prediction and deterioration modelling, as with any newly installed system, there may be an "early failure" period in which the failure rate is initially high but then gradually decreases to a steady failure rate. Similarly, it is expected that the reliability statistics will initially worsen with the implementation of the new OMS, but will improve and normalize as the outage management processes improve, thereby resulting in better data. Industrial case studies have also shown that the application of a new OMS may worsen the performance on the reliability KPIs due to improved outage tracking capabilities.

There may be major unforeseen risks, which mainly stem from the integration of the OMS with various other systems. Such as the integration with the AMI meters and which will facilitate the 'pinging' of the meter in order to pull data. The Electra OMS improved functionalities will allow the real time update from the GIS, which are just a few integration functionalities, hence, more time is needed to ascertain any potential risk.

Therefore, considerations is being requested for a reprieve from the targets for an initial/trial period of four (4) months to address any unforeseen issues that may arise as was consistent with the implementation of the Ventyx OMS.

- **Impact on Data Dictionary**

The Data Calibration Dictionary was initially developed based on JPS' recommendations and was approved by the OUR in order to have a standard in the classification of Non-Reportable outages due to the constraints experienced by JPS. Therefore, in being consistent, JPS is making a recommendation for "No Supply" but verified as Power Quality calls to be considered as a Non-Reportable.

Due to the trial period of the Electra OMS, JPS is requesting an immediate implementation of the recommended updates to the Rule based Data Dictionary which will affect the criteria for Non-Reportable outages.

The new OSI OMS will allow dispatchers to process outages more efficiently by reducing or possibly eliminating secondary outages that were caused by a major outage. The full integration with SCADA and ADMS eliminates the need for manual replication of outages, reducing Rule 4 - Operator Errors significantly. Other conditions and potential benefits to the Data Dictionary are outlined in Table 2-11 below.

Table 2-11: New OMS Impact on Data Dictionary

Rule and Condition	Impacts
Rule 1 Condition 2 – "Assignment of loads to a transformer in excess of 120% greater than its capacity."	The consolidation of a more modern GIS electrical model and improved customer to transformer connectivity is expected to reduce the number of transformers with excessive customer count.
Rule 1 Condition 3 – "Where opening of a SCADA device, triggers the OMS to infer that the start time is equal to the earlier start time of that of a previously unverified or unfrozen downstream outage."	Since the OSI OMS and SCADA will be integrated and share the same platform, the start and end times for all SCADA devices will therefore be replicated accurately in OMS. Therefore, there will be a reduction of non-reportable outages, as they would now be recorded as reportable.
Rule 1 Condition 4 – "Difference greater than 10 minutes between OMS outage completion time and field crew mobile tablet completion time."	The OSI OMS will be integrated with the Clevest Workforce Management System. Hence, outage completion/recovery times logged in the Workforce Management tool (Clevest) will be automatically updated in the OMS.
Rule 2 – "Premises found Locked and customer outage cannot be verified, Premises Not Found, Defective Customer Equipment and Disconnection."	In order to manage the risk of the new OMS due to the operation, these outages are logged automatically and therefore JPS is requesting for these events classified under this criterion to be excluded in the reliability reporting. These events will be managed outside of the OMS and reporting framework, thereby reducing the impact of "non-reportables'.

2.5 2019-2024 Rate Determination Request and Concerns

- **Daily System Customer Count**

The OUR has raised a concern regarding the daily system customer count, due to this parameter being used in the computation of the reliability KPIs. As such, the accuracy of the daily system customer count will directly affect the credibility of the reliability performance for the Q-Factor filing. Thus, JPS has been diligent and have taken the appropriate action to ensure that the customer count is reliable and accurate.

In accordance with the Ventyx OMS, the daily customer count utilized to compute the reliability indices is extracted once a day through an automated process from the Customer Information System "CIS" versus the new Electra OMS which will be updated real time. These are "active" customers in the CIS, including prepaid, disconnected and suspended accounts.
For emphasis, the summary statistics of the daily customer count included in the 2021 outage dataset is presented in Table 2-12 below, and a daily customer mapping is provided in Figure 2-5.

Table 2-12: JPS Daily Customer Count Statistics – 2021 Outage Dataset

DAILY CUSTOMER COUNT SUMMARY STATISTICS - 2021 OUTAGE DATA -						
Avg.	**Min.**	**Max.**	**Avg. Daily Δ**	**Max. Daily Δ**	**Count @ 1/1/21**	**Count @ 31/12/21**
698,935	688,073	712,495	109	733	688,073	712,495

Updates in the Ventyx OMS were done at 12:00 am daily and the metrics for each reporting day are automatically calculated for outages that occur within 24 hours before extracting the number

of clients. The customer count value constitutes the “active” customers on the network, which is a combination of connected and disconnected/suspended customers at the time as represented in the CIS. In order to mitigate doubt, please note that there are two categories of accounts defined in the CIS as follows:

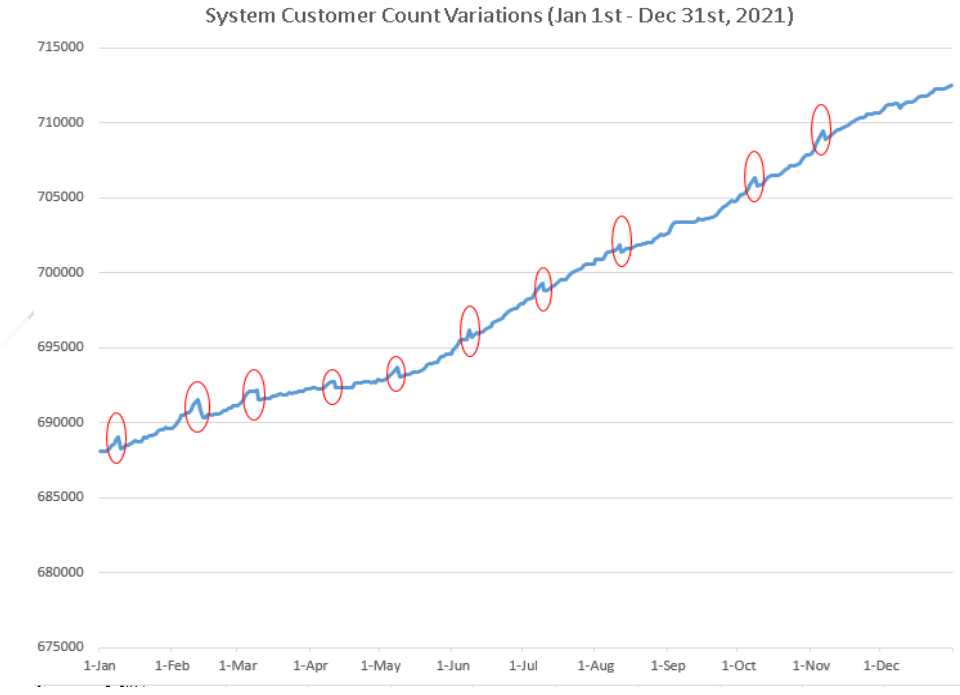
1) Active - These are accounts with the following status:

- Post Paid with meter advancing and being billed
- Prepaid
- Disconnected/Suspended and being billed

2) Inactive:

- Terminated (inclusive of accounts terminated by customer request, expiration of temporary account and disconnected accounts being in a suspended state after one (1) year).
- Customers with suspended and disconnected accounts for non-payment remains as part of the "active" customer count. However, customers with terminated service are converted to "inactive" and are not included.
- No further adjustments are made before customer count data is included in the outage dataset.
- The Customer Information System (CIS) is synchronized with the new OSI OMS. The customer count is updated daily at 12:00 midnight to facilitate Q-Factor reporting. Other related systems such as the GIS are updated once monthly. The move in and move out of customer between “Active” and “Inactive” may impact the derivation of the reliability indices, based on the number of customers involved.

Figure 2-5: Variation in JPS Daily Customer Count in the 2021 Outage Dataset



As demonstrated in Figure 2-5 and Table 2-12 above, the 2021 daily customer count profile shows 688,073 customers at the start of the year to a gradual increase of 712,495 customers as at December 31, 2021. The variance in customer count in the Customer Information System (CIS) is quite dynamic in nature and is due to the normal daily "move in/move out" activities such as new connections and the removal of inactive customers from the network. During the period, JPS has been making continuous efforts to improve the dynamic nature of the daily customer count. Thus, the maximum single day variation in customer count for 2021 was 733 customers versus 1422 customers in 2020, which is a 48% improvement. This variance is due to these "move in/move out" processes, more specifically:

- New customer installations; and
- Customer terminations.

As an account moves from an active state to an inactive state after termination there are factors that can contribute to the delay in real time updates to the Customer Information System (CIS). To address the customer count concern, there is a manual trigger that can be done mid-month or closer to the end of the month; however, due to this occasional stall, the customer base may vary.

With the new Electra OMS, the number of customers used to determine the reliability metrics is retrieved real time by an automated process from the CIS.
These are "active" customers of the CIS, which include prepaid, deactivated and suspended accounts. Thus, the GIS integration allows JPS to incrementally improve the accuracy of the customer count data by updating the network model more frequently.

- **Major Events Days**

In Paragraph 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.

- **Reliability Indicators across Service Areas**

JPS notes the OUR's concerns about the significant differences in quality of service between service areas. The Company's ongoing strategy is to minimize variance in quality of service across the parishes by monitoring the reliability at the feeder level (a bottom-up approach to improving reliability). However, it should be noted that the feeders highlighted by the OUR in the previous year are amongst the worst feeders as they serve some of the most remote areas of the distribution network, and are considered some of the longest feeders. Therefore, the larger feeders which traverses a wider the geographical area (various terrain), will see a larger number of outages when compared to the shorter feeders. The shorter feeders, as highlighted by the OUR are situated in mainly built-up and commercial areas. The number of outages is therefore not a favourable measure to compare the quality of service across these feeder service areas, as fewer customers

will experience repeated outages on the longer feeders. Notwithstanding, the feeders highlighted by OUR in Table 2-13 have significant improvement in the number of outages in 2021 versus 2020.

Table 2-13: Highest & Lowest Number of Reportable Forced Outages on Feeder Level

FEEDERS ASSOCIATED WITH HIGHEST & LOWEST NUMBER OF REPORTABLE FORCED OUTAGES IN 2021									
HIGHEST NUMBER OF REPORTABLE OUTAGES					**LOWEST NUMBER OF FORCED OUTAGES**				
#	**Feeder**	**Momentary Outages**	**Sustained Outages**	**Total Outages**	**#**	**Feeder**	**Momentary Outages**	**Sustained Outages**	**Total Outages**
1	Bogue 310	73	2189	2262	1	Queens Drive 510	-	1	1
2	Orange Bay 310	113	2049	2162	2	Monymusk 310	3	4	7
3	Cardiff Hall 310	192	1794	1986	3	Twickenham 410	2	9	11
4	Bogue 610	70	1679	1749	4	Hunts Bay 110	3	13	16
5	Constant Spring 410	53	1680	1733	5	RockFort 310	7	14	21
6	Spur Tree 310	72	1466	1538	6	Up ParkCamp 310	13	25	38
7	Spur Tree 210	89	1380	1469	7	Hope 310	12	29	41
8	May Pen 110	91	1331	1422	8	Hunts Bay 210	10	33	43
9	Queens Drive 710	153	1252	1405	9	Three Miles 310	9	40	49
10	Maggotty 210	56	1309	1365	10	West Kings House Road 210	19	43	62
	2021	962	16129	17091		2021	78	211	289
	2020	1090	17449	18539		2020	44	93	137

The ten worst performing feeders in 2021, accounted for 17,091 (30%) of the total number of Reportable forced outages (57,333). Of note, these were also the top ten (10) worst performing feeders in 2020. A key highlight is that outages for these top ten worst performing feeders have improved by 8%. In contrast, the ten feeders with the least number of outages accounted for only 289 outages, 0.5% (less than a percentage point), of the total 2021 reportable forced outages. Comparatively, there was also a significant increase by 8% in outages from 2020 to 2021.

- **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, 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.

2.6 Conclusion

- With the introduction of a new OSI OMS, the improved outage management capabilities may result in the worsening of the reliability indices and unforeseen challenges associated with the introduction of a new software. This is consistent with lessons learnt in the electric utility industry. Therefore, considerations are being requested for a reprieve from the targets for an initial/trial period of four (4) months to address any unforeseen issues that may arise as was consistent with the implementation of the Ventyx OMS.
- Ongoing performance review of the new OMS may result in a revision of the current Data Dictionary. Such as considerations to be granted by the OUR for the exclusion of the reliability impact of Motor Vehicle Accidents, which are "unavoidable", as provisioned in the Electricity Licence, 2016, the exclusion on events classified under Rule 2 – *Non Utility Related Outage* and the addition of power quality calls to be considered as Non-Reportable.
- Mechanism to be established with OUR/MSET for the timely approval of Force Majeure, as provisioned in the Electricity Licence, 2016.
- Re-consideration be given by the OUR, for the adoption of the 2.5 beta methodology in the IEEE Standard, thereby excluding these events from the normal reliability performance. This is consistent with regulatory utility practice.
- Provisions to be granted by the OUR, for the re-adjustment of their annual reliability targets, to align with current local and global occurrences, thereby affording JPS a reasonable ability to achieve the established targets. Areas, such as the CAIDI target, should be established based on. JPS's ability/capacity to respond to outages.
- JPS proposes that the definition of "Major System Failure" should be consistent with international utility best practices.

3. 2022 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 2022 Annual Revenue Target is J$51.3B when the formula above and the inputs discussed in Chapter 2 was applied and is depicted in Table 4-1 below. This translates to an increase of 9.1% in non-fuel revenue when compared to 2021 as detailed in Chapter 7 (Tariff Design).

Table 4-1: 2022 Annual Revenue Target Calculation

2022 Annual Revenue Target (J$M)		
Description	**Formula**	**Value**
Approved Revenue Cap	RC2022	37,957
Annual Rate of Change	dPCI	32.77%
Adjusted Revenue Cap	RC2022 * (1 + dPCI)	50,394
Revenue Surcharge	RS2021	(599)
FX Surcharge	SFX2021	1,455
Interest Surcharge	-SIC2021	(45)
WACC		11.87%
2021 Adjustments	RS2021 + SFX2021 - SIC2021) * (1 + WACC	907.32
2022 Annual Revenue Target	**ART2022**	**51,301**

Noteworthy, the 2022 ART in Table 4-1 reflects the inclusion of a Q-Factor penalty of -$95M due to the absence of a Force Majeure which is encapsulated in a negative adjustment of 0.25% in the dPCI factor to 32.77%.

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 2021 review is the second Z-factor adjustment review to be conducted for JPS capital investment performance.

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:

1. Project Delays

The delays in a Major Project or Extraordinary Maintenance Project can trigger the Z-Factor adjustment, if there is at least 5% variation in the annual expenditure for each of the various projects, 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.

2. 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.

3. Unplanned Projects

Where there arises a need for a project that is categorized as being either a Major Project 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.

4. Changes in Project Scope

A change in the scope of a project that is classified as a Major Project 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 gave JPS approval to invest US$84.0M in 2021 on 45 Capital Projects/Programs. Of these 45 Projects/Programs, ten (10) were classified Major or Extra-Ordinary Projects while thirty-five (35) were classified Minor Projects. As outlined in the 2020 annual adjustment filing JPS proposed completing projects and scopes that were slated for completion in 2020 but were delayed due to various reasons. This lead to five (5) additional minor project being attempted in 2021. This means for 2021, JPS attempted fifty (50) capital projects including the new scope to GT10 and Corporate Area Capacitor Bank projects which were approved by the OUR in 2021 but which are not currently part of the Revenue Requirement.

For the Year 2021, JPS spent US$70.2 on the projects approved by the OUR; US$40.7M was spent on Major and Extra Ordinary Maintenance Projects while US$29.3M was spent on Minor Projects.

In the category of Major and Extra-Ordinary Maintenance Projects, five (5) projects were fully completed, three (3) were practically completed with plans to finalize in 2022 while one (1) was put on hold based on the impact of inflation on inputs that resulted during the procurement phase of the project; JPS has already provided detail of this to the OUR. The total underspend in these categories of projects is 20%, where JPS overspent the approved budget on three (3) of the projects.

In the category of Minor Projects, thirty-nine (39) projects were attempted; twenty-one (21) projects were completed, three (3) projects practically completed, two (2) had scope reductions and thirteen (13) projects are ongoing to be completed in 2022. The total underspend in this category of projects is 11.7% where JPS overspent the 2021 approved budget on eleven (11) projects.

4.1 Capital Projects Performance for 2021

Paragraph 7.1.5 of the Final Criteria outlines that JPS shall provide adequate information in its Annual Review filling to allow the OUR to accurately assess the capital expenditure, the degree of project implementation and the cost, time and design deviations from the original plan. In keeping with this requirement, JPS will provide individual project updates on Major and Extraordinary Maintenance Projects in order to enable the regulator to understand any material deviations in cost, time and scope from the approved projects.

In 2021 JPS sought to implement the projects approved for investment in 2021, as outlined in the 2020 Annual Adjustment filing, as well as to catch up on the projects that were underspent in 2020 and to offset the ones that were overspent in 2020.

The Major Projects approved in the 2019-2024 Rate Review Determination to be reviewed for 2020 are as outlined below:

- Smart Meter Program;
- Old Harbour – Hunts Bay 138 kV Line;
- Voltage Standardization Program;

- RAMI Projects;
- Grid Modernization Program;
- Critical Spares – Generation;
- Distribution Line Structural Integrity;
- Customer Growth (CCMA);
- Smart LED Streetlight Program; and
- 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 a budget of US$14.6M to install smart meters in 2021. This equates to approximately 81,000 meter installations. However, in 2020, JPS had installed approximately 70,000 smart meters at a cost of US$13.3M; the OUR had only approved US$8.7M for expenditure in 2020. This means JPS had pre-spent US$4.6M on the smart meter program from 2020. To make whole, JPS reduced the 2021 expenditure on smart meters to US$8.9M which facilitated the installation of approximately 48,000 smart meters.

Old Harbour-Hunts Bay 138kV Transmission line

JPS planned to advance easement activities as well as engage EPC contractors for the construction of the new 40 km transmission line from Old Harbour as well as the new substation at Hunts Bay. The planned 2022 expenditure was US$5.4M. After an extensive procurement process including unprecedented background checks on bidders, JPS found the proposals to be significantly more expensive than the budget approved for the project. The main reason cited by bidders was inflation in the cost of inputs such as shipping costs. As a result, JPS has re-submitted to the OUR new cost estimates based on the findings and currently awaits approval before proceeding with the project. The expenditure for 2021 was US$0.2M, which mainly supported environmental permits and easement negotiations. This project represents the most significant variation from plan.

Voltage Standardization Program

The 2022 Voltage Standardization Program (VSP) was approved by the OUR for US$3.2M to facilitate the conversion of one (1) distribution feeder emanating the Blackstonedge Substation and two (2) distribution feeders emanating the Highgate Substation. JPS spent US$2.9M in 2021 and completed the upgrade of the three (3) feeders from 12 kV to 24kV. This required reinsulating 322km of distribution line which represents 85% of the needed re-insulations, and construction of 1.4km of new lines to facilitate transferability between Highgate and Annotto Bay substations. The remaining 56km of re-insulation will be completed in 2022 and will cost an additional US$0.3M.

The project faced difficulties in procuring key inputs such as conductors, insulators, poles and transformers as global supply chains were impacted by the pandemic. Approved planned outages which were required to carry-out critical work were also reduced in 2021 to minimize the

inconvenience to customers who had to stay home as schools and work places were closed in response to the pandemic. While there was no direct government mandate to do this, JPS received several communications from leaders at the local level, requesting delays in planned outages due to the effect on school and work from home.

RAMI Projects

The RAMI program was approved to spend US$4.8M in 2021, JPS spent US$4.7M on the program by the end of 2021. The Company commenced RAMI upgrade projects in nine (9) communities across Jamaica in an effort to make them resistant to theft. Construction in Six (6) communities was completed, (Melbrook Ph2, Annotto Bay Ph2, Marverley, Cassava Piece, Montpelier, and August Town Ph1).

Three (3) projects (Steer Town, Grants Pen Ph1, Barrett Hall – Lilliput Ph1) were incomplete due to shortage of key materials as a result of slowed supply chains and a crisis in shipping items particularly from China in 2021. Based on commitments from suppliers, these have been rescheduled to be completed by November 30, 2022.

The roll out of the project in 2021 was hampered by the Covid-19 pandemic that disrupted the supply of key inputs such as poles, conductors and insulators and has resulted in the other three community upgrades being deferred to 2022.

Grid Modernization Program

The Grid Modernization Program was approved to spend US$2.3M in 2022 to install 300 - 24 kV@100 A TripSavers; 25 Distribution Automation Sectionalizes (DA Switches), 4 Pole Mounted Reclosers and 100 Fault Circuit Indicators across the distribution network.

In 2021, 300 TripSavers, 104 Fault Circuit indicators, and 25 DA Switches were installed at a cost of US$1.8M. The intended benefit was 24.6 minutes reduction in SAIDI and 17.5 MWH reduction in unserved energy. For the period December 2022 and March 2022 JPS has measured 4.7 minutes savings in SAIDI in the areas where the installations were done, which represents a 24% improvement. JPS expects this to grow to 24.6 minutes by the end of 2022.

Distribution Line Structural Integrity

The distribution Structural Integrity Program was approved at a spend of US$4.56M in 2021; JPS spent US$5.3M on the program for the year. The 2021-planned scope was to replace 2,400 distribution poles at an advanced stage of deterioration and rehabilitate 4,424 poles that were in less advanced stages of decay. The program also sought to replace ~ 11,600 pieces of equipment (Cross-arms, insulators etc.). At the end of 2021, JPS replaced 3,474 degraded distribution poles, rehabilitated 5,987 poles and replaced 12,546 pieces of equipment.

This represents an over spend of US$0.76M or 17% for 2021. In 2022 JPS intends to reduce the approved budget by the equivalent amount to ensure the overall envelope is not increased. The additional work to strengthen distribution structures in 2021 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 which JPS needed to replace to ensure customers were reconnected in a timely manner 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$4.9M in 2021, but JPS spent US$5.3M on the program resulting in a 7% overspend. The CCMA program is used to construct infrastructure to enable complex connections to the distribution network and is done at the request of customers. Condition 13 of JPS Electricity Licence, 2016 obligates JPS to connect customers under specified conditions and this programme allows JPS to fulfil its mandate under the Licence.

In 2021 JPS actioned seven hundred and seventy four (774) requests for complex connections valued at US$9.7M with three hundred and forty seven (347) completed in 2021 and the others carried over to 2022. Based on aggregated transformer capacity JPS estimates ~31,400KVA of new capacity was added through these 347 completed projects in 2021 which is projected to add ~79,250 MWH of new demand annually going forward. 27% of the requests for new connections have come from Kingston and St Andrew. There continues to be an increase in the requests for connections particularly in the corporate area, North Coast and St Catherine. This is related to the expansion of the Business Process Outsourcing (BPO) and housing sectors with apartment complexes and sub divisions being the main drivers. This program is critical to growing (sales) demand for electricity and helping to reduce the average tariff.

Meters & Service Wires

The meters and service wires project was approved to spend US$2.7M in 2021, the project actually spent US$4.2M during the 2021 budget year representing an overspend of 56%. The project executed the installation of over 21,000 customer meters and build out of 449KM 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 2021. This program is also mandated by Condition 13 of the Electricity Licence, 2016 which requires JPS to connect all customers seeking to connect to the distribution grid. The program also replaces defective customer meters. If these meters are not replaced JPS would 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 in a material manner and JPS will apply to the OUR at the next annual rate review filing for an adjustment to the approved budget for this program.

Smart LED streetlight Program

JPS intended to complete the Smart LED streetlight program in 2021. This is a muti-year project designed to replace 105,000 HPS streetlights with Smart LED streetlights. JPS set out to replace the final 20,000 in 2021 as at cost of US$6.9M. JPS spent US$6.06M in 2022 on the Smart LED streetlight program; this enabled the replacement of ~20,700 streetlights as well as mapping of all locations in the GIS database. Due to the disruption to global supply chains of semi-conductors,

the delivery of smart controllers to JPS was delayed to December 2021. As a result, the installation of these smart controllers will be delayed until 2022. This will represent a further expenditure of US$0.8M in 2022 to ensure all LED streetlights have full smart capabilities and meet the requirements of Condition 28(6) of the Electricity Licence, 2016.

Critical Spares – Generation

The program to replace critical capital spare parts at power plants was approved to spend US$1.55M in 2022; JPS spent US$1.3M on the program during the budget (calendar) year. JPS managed the availability of the generation fleet by replacing only spare parts that were deemed to be near the point of failure; this helped to contain expenditure on this program while maintaining planned fleet availability.

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 by in Table 2 of the Appendix, collectively has 11.7% net underspend of the approved budget. Of the forty (40) projects approved in this category, twenty-one (21), were completed as planned with four (4) partially completed, thirteen (13) are delayed and will be completed in 2022, while (2) are multi-year to be completed in 2022. The approved budget for 2021 was US$33.1M and a total spend by JPS of US$29.3M.

The continued fall out from the global pandemic resulting in an operating environment that is hostile to project execution against plan continues to plague the projects and is the main driver for deviations from the plan.

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 and JPS requests that the OUR not implement a Z-Factor adjustment on major projects using the methodology as it is the subject of ongoing legal appealed.

JPS proposes that ***no Z-Factor adjustment*** be implemented in 2021 for the value associated with the overspend in 2020 to implement the smart meter project. During 2020 JPS overspent the program by US$4.66M and received no compensation for this. Over the 2021-2022 period, total expenditure is in line with approved values; JPS is of the view that the US$4.66M should be factored into the 2021 expenditure before any variance calculation is done. JPS holds that it would be unfair and against the spirit of the licence to execute a z-factor penalty even though the capex was prudently incurred in 2020 without any additional ROI to JPS for the early spend from which customers benefited.

For projects that JPS has overspent in 2021, the Company is proposing that it be allowed to offset the 2022 expenditure with the 2021 overspend. JPS does not request an increase in the Revenue Requirement. The meters and service wire programme is an exception as JPS does not believe it

will be able to curtail expenditure on the program to remain within the approved investment plan aggregate. JPS will therefore make an application for a review of the approved budget for meters and service wire programme at the next annual rate review filing.

JPS proposes that no Z-Factor adjustment be implemented for the 138kV transmission line project in this filing. . The reason there is underspend on the 138kV line project is the escalation in costs that JPS has faced in trying to implement the project.

In Q1 2022 JPS presented to the OUR, findings of its procurement process and the proposed way forward for the project. JPS now awaits the OUR's response to the proposal.

The utility has invested great effort and time into the project so far and require the OUR's approval of the new budget and timeline before it can proceed with the project. JPS will not seek an adjustment to the Revenue Requirement for the new 138kV Transmission line budget in this rate filing but will include the request in the next annual adjustment filing.

JPS has not cancelled the implementation of any approved 2021 project and does not intend to delay any of the projects beyond the 2023 regulatory window; except for the 138kV Transmission line. The approved project scopes that were not executed in 2021 face a timing variance due to the factors outlined in this chapter with some projects having made contractual commitments for the supply of inputs and services to be delivered in 2022. The activities not completed in 2021 will be fully caught up in 2022.

4.2 Capital Projects Performance Outlook for 2022

In 2022, JPS intends to execute the projects approved in the 2019-2024 Rate Review Determination for 2022 implementation as well as the projects and scope deferred from 2021. Where there was overspend on projects in 2021, this will be offset against the 2022 approved amounts. Therefore, by the end of 2022, the approved expenditure for 2021 and 2022 will be expensed in total and the planned project activities will be completed.

This assumes global supply chains return to normal as nations ease their travel restrictions and lockdown rules.

2022 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 reflects the budget by project for 2022 including the carry-over amounts deferred from 2021. This shows that at the end of 2022 JPS will expend all funding approved for 2021 and 2022. In 2022 JPS intends to complete two projects, which were not submitted in the 2019-2023 Medium term investment plan. These projects are 40 MVARS Bulk Capacitor Banks and GT 10 Major Overhaul. Both projects became necessary after the retirement of the B6 power plant at Hunts Bay. They provide grid stability and will alleviate the need for a non-economic dispatch due to generation shortfall in the corporate area. The OUR has already given approval for these two projects and JPS is also applying for the incremental revenue requirement associated with these two projects in this current filing.

JPS also intends to continue the implementation of the 138kV transmission line project as soon as the OUR approves the updated budget and completion timelines for the project. This would result in reduced expenditure versus the already approved spend for 2022 but would result in an additional US$20.7M between 2023-2025.

5. System Losses Performance Review

5.1 Introduction

JPS, in the four years prior to 2020, made significant strides in its loss reduction efforts particularly in the areas of smart meter installations, transformer metering, energy balance implementation, strike force operations and audits. With a second year of the COVID-19 pandemic, however, JPS has, for 2021, seen the further deterioration in system losses when compared to 2020. Several of the loss prevention programs for 2021 were derailed for the most part by global supply chain issues. For example, the Company experienced meters and communication devices shortage. As a result, there were delays and lower than expected loss reduction. High system losses, driven mainly by electricity theft, continued to be a problem. Some of the contributing factors were the increased unemployment, curfews, work-from-home policies, and virtual classrooms which gave rise to the increase in residential demand.

Notwithstanding, the challenges, JPS is committed to its loss reduction efforts including the transitioning of all of revenue meters to smart meters. Aggressive regularisation targets under the Social Intervention program will be pursued in 2022. Loss reduction Initiatives are expected to yield 53,000MWh.

5.2 System Loss Performance for 2021

System losses continued to deteriorate in 2021 reaching the highest level ever at 28.29% compared to 28.03% in 2020. Figure 5-1 below shows how the downward trend in system losses was reversed at the onset of the COVID-19 pandemic. The linear trend seen from 2016 - 2019 suggests that system losses would have been around 25.69% were it not for the pandemic.

Figure 5-1:12-month rolling system loss rate trend from December 2016 to December 2021

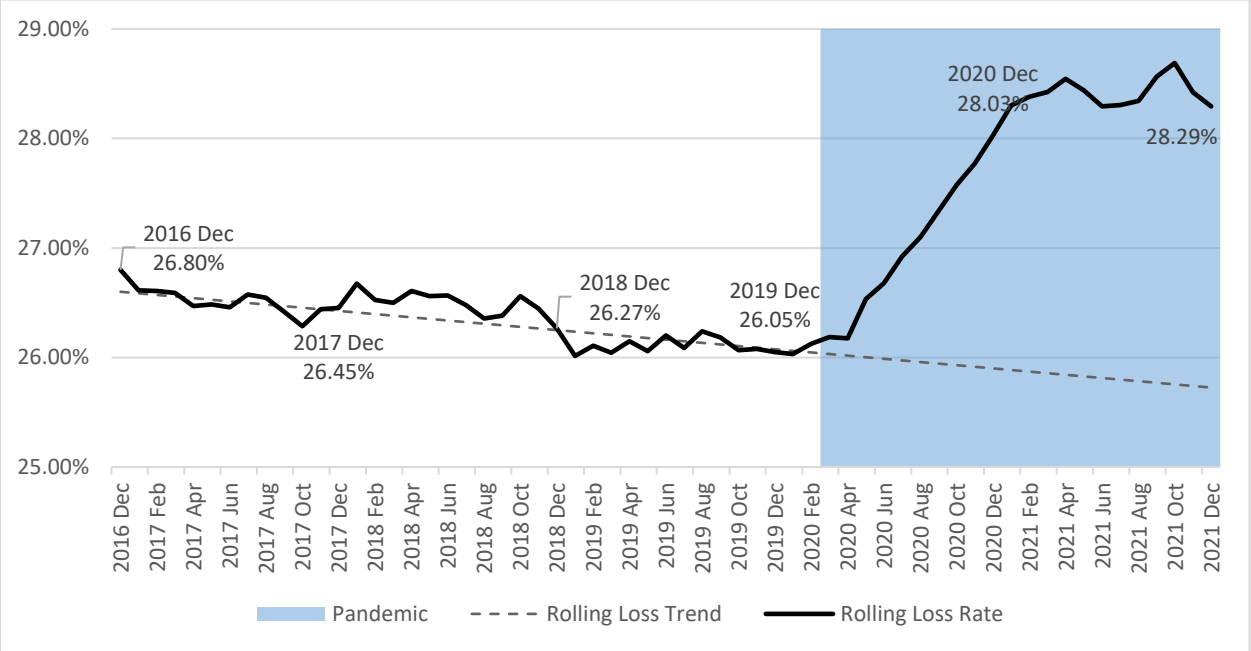


Table 5-1 below shows that the increase and high levels of system losses is due primarily to non-technical losses which increased by 1.29% over 2020. Overall system losses increased by 0.93% compared to 2020.

Table 5-1: Loss rates in 2020 and 2021

	2020 Rate	2021 Rate	Change
Technical Loss	7.91%	7.91%	0%
Non-technical Loss	20.12%	20.38%	1.29%
System Loss	28.03%	28.29%	0.93%

Table 5-2 below shows that in terms of energy, non-technical losses increased by 3.15%, and technical losses by 1.85% compared to 2020. Overall energy lost was up by 2.78%. Net generation increased by 1.81%, which explains why the technical loss rate did not change appreciably.

Table 5-2: MWh losses in 2020 and 2021

	2020 Energy (MWh)	2021 Energy (MWH)	Change
Technical Loss	334,307	340,485	1.85%
Non-technical Loss	850,480	877,282	3.15%
System Loss	1,184,788	1,217,767	2.78%

5.2.1 Technical Loss Initiatives

In its 2019 application and subsequent reviews, JPS outlined several initiatives for 2019 - 2024 rate period designed to improve system losses. There were two technical loss-reducing initiatives in 2020 with an impact occurring in 2021 shown in Table 5-3 .

Table 5-3: Technical loss-reducing initiatives in 2020 with an impact occurring in 2021

Initiative	Planned Scope	Actual Scope	Planned Impact (MWh)	Actual Impact
Voltage Standardization	2 Feeders (2020)	2 Feeders	132	499
Distributed Generation	10 MW	10 MW Plant	600	TBD
Total			732	

The 10 MW CB Hill Run project although originally slated to be commissioned in 2020 was actually commissioned in December 2021 and thus its technical loss reduction benefits are expected to be derived starting in 2022.

Voltage Standardization

The resistive loss in electrical conductors increases with the square of the current carried. The voltage standardization initiative aims to reduce the current in primary distribution conductors by increasing the voltage to 24 kV. Given that electrical power depends on both voltage and current, higher voltages means that less current is required to deliver the same power. Additionally, the initiative is aimed at getting all primary distribution feeders at the same voltage, which allows increased flexibility in managing outages and maintaining reliability.

At the end of 2020, two feeders from the Upper White River substation (Upper White River 110 & 210 in the parish of St. Mary) were converted from 12 kV to 24 kV for which technical losses reduction was realized in 2021.

The impact of this initiative is included in the full primary distribution assessment accompanying this submission.

Distributed Generation

The resistive loss in electrical conductors is also related to the length of the current path through the conductors, all other things being equal. Thus, the farther that generating assets are from loads is the higher these resistive losses. With distributed generation, smaller more decentralized assets closer to the loads that they serve are favoured over larger centralized generating assets. In distributing generation this way, the average current path length is reduced, which reduces the technical loss.

JPS has 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. This project is the first of its kind in Jamaica and was commissioned in December 2021 and thus the technical losses benefits to be derived from this project are expected to be realized starting in 2022.

5.2.1.1 Non-technical Loss Initiatives

The non-technical loss initiatives implemented in 2021 were focused on addressing four of the five aspects of non-technical loss: the perceived likelihood of discovery, social attitudes, availability of means, and the economics of electricity theft. *Table 5-4* below shows a summary of the loss avoided by the various initiatives in 2021.

Table 5-4: Summary of non-technical loss initiative performance in 2021

Initiative	Planned Scope	Actual Scope	Planned Impact	Actual Impact
Smart Meters	45,000 meters	47,631 meters	21 GWh	17.3 GWh
Audits & Investigations	87,500 audits	75,026 audits		
RAMI	7,000 regularised	2,494 regularised	17.6 GWh	1.6 GWh

Initiative	Planned Scope	Actual Scope	Planned Impact	Actual Impact
Social Initiatives, Community Renewal & Strike Force	11,750 regularized	3,198 regularised	6.9 GWh	4.8 GWh
Total			**45.5 GWh**	**23.7 GWh**

JPS maintains the position that it has limited control over most of the factors of non-technical loss. Notwithstanding, there were ambitious plans to convert more illegal consumers to customers than ever before. This took the form of various social initiatives that attempted to incentivise persons to legitimise. The performance of these social initiatives in 2021 was far below expectation primarily due to the house wiring and certification barriers.

The smart meter and RAMI initiatives were heavily impacted by the global supply chain issues, which lead to a shortage of meters and communication devices needed to implement these initiatives. This caused delays and resulted in lower than expected loss reduction.

Smart Meters

The smart meter initiative is the foundation of JPS' efforts to improve the likelihood of discovering instances of non-technical loss. The remote telemetry provided by these meters is used as an input to analytical tools, which ultimately guides the audits and investigation process. Smart meters also provide additional benefits to JPS and its customers including:

- Higher resolution consumption monitoring
- Remote disconnections and reconnections
- Demand profiling

Due to the significant benefits afforded by the technology, JPS has presented a plan to completely transition all of its revenue meters to smart meters by 2024, except in special cases. JPS planned to install 60,000 meters in 2021. This target was reduced to compensate for previously exceeding the allocation in 2020. The pandemic also affected global supply chain issues, which resulted in shipment delays of several months for the meters. This severely affected the deployment of smart meters with the bulk of the deployment occurring at the end of the year. Despite this challenge, JPS installed 47,631 smart meters in 2021. However, the loss reduction benefits of the meters were not realised in 2021 due to the delay in installation.

Audits and Investigations

Loss investigations are an ongoing activity where a customer's premises is audited to determine if and the extent to which energy has been lost. Investigations conclude the discovery process and are a prerequisite for any corrective action taken by JPS. Investigations can be prompted by anything that gives reason to suspect loss, including customer complaints, consumption patterns, and analytics. Rate 40, 50, and 70 customers are audited at least once per year.

There were 75,026 investigations completed in 2021 with 8,258 irregularities discovered and approximately 17 GWh of lost energy recovered as shown in

Table 5-5. Residential and small commercial investigations amounted to 65,699. The target for the year was 21 GWh of recovery supported by smart meters and analytics.

The pandemic continued to interfere with operations observed primarily in decreased availability of crews to perform investigations due to increased sick leave.

Table 5-5: Loss investigations in 2021

	Investigations	Irregularities	MWH Recovered
Small accounts[3]	65,699	7,172	11,280
Large accounts	9,327	1,086	5,989
Total	**75,026**	**8,258**	**17,269**

Residential Automated Metering Infrastructure (RAMI)

RAMI, as this initiative is known, reduces the level of access that customers have to their meters by relocating them in an enclosure mounted on the transformer or pole. This is accompanied by the removal of external secondary distribution conductors altogether. This makes it extremely difficult, though not impossible, for persons to steal electricity because the energy is already metered upon leaving the transformer/RAMI enclosure. Additionally, these RAMI meters have remote telemetry and administration features with similar benefits as smart meters. This initiative is aimed primarily at reducing the availability of means (or convenience) for electricity theft.

While RAMI solutions demonstrate very good effectiveness in curtailing losses especially when coupled with social initiatives, it is an expensive solution that is only feasible in areas with very high and concentrated levels of theft. JPS planned to undertake ten projects in 2021 of which nine required pole line construction due to a lack of infrastructure. Due to the global supply chain issues, only six projects were completed in 2021 out of the planned 10. Those issues also resulted in the six projects being completed in 2021 later than expected and the four remaining projects being delayed until 2022. The planned benefits of the projects were not realised in 2021 due the delays in project completion.

The six completed project areas yielded 2,025 transfers and 469 new customers. The table below shows how the losses have been reduced in the project areas. These reductions are equivalent to approximately one (1) GWh reduction per month.

[3] Residential customers and small commercial customers using less than 3 MWh monthly

Table 5-6: Loss reduction in project areas

Project Area	Pre-Project Loss Rate	Planned Post-Project Loss Rate	Actual Post-Project Loss Rate
August Town Phase 1	72%	15%	12.86%
Cassava Piece	78%	15%	13.62%
Marverly	72%	15%	11.98%
Melbrook Phase 2	58%	15%	13.01%
Montpelier	63%	15%	8.94%
Annotto Bay Phase 2	51%	15%	10.28%

Community Renewal

Community renewal is an umbrella term used for initiatives that are focused on addressing socioeconomic issues that drive non-technical loss at the community level. These initiatives heavily rely on collaborating with public and private agencies and community representatives to administer social programs. Community renewal typically operates in high loss areas with predominantly illegal users, often alongside other initiatives like RAMI. The main goal is to convert illegal users to legitimate customers, a process called regularization, through social programs. Wherever possible, however, community renewal tries to reduce the consumption of illegal users.

Recognising the spiralling system losses, the Company set aggressive regularisation targets for 2021 despite the position that most of non-technical losses are outside of its control. The target was 8,000 customers regularised and a 6.9 GWh reduction in lost energy (a target shared with the Strike Force initiative). This was to be realised through a suite of new social intervention pilots as outlined in the table below. The goal is to quickly try different approaches and see which ones work well and expand them.

Table 5-7: Results of New Community Renewal Pilot Initiatives

Pilot Initiative	Actual/Planned Loss Reduction (MWH)	Actual/Planned Customers Regularized
Ambassador Engaging local influential representatives to encourage illegal users to regularize	106/3,371	334/5,000
Grand Bonanza Incentivising new prepaid customers through prizes issued via a draw.	202/1,237	933/1,500
JPS Powers Education Offering tablets with pre-loaded education material to regularized customers with qualifying children in exchange for regularisation.	40/677	164/500

Pilot Initiative	Actual/Planned Loss Reduction (MWH)	Actual/Planned Customers Regularized
Health Care for Children Offering health incentives to regularized customers with qualifying children	8/813	26/500
Health Care for Seniors Offering health incentives to regularized customers who qualify as senior citizens	11/621	37/500
House Wiring Partnership to align JSIF's house wiring program with system loss reduction and regularization objectives.	3/1,093	86/1,500
Build-with-Us Incorporating JPS supply in construction permits	N/A	N/A
Permit-To-Party Incorporating JPS in event permit applications	N/A	N/A

There was very little support on the part of the Ministry of Local Government (MLG) for the Build-with-Us and Permit-to-Party initiatives, which requires the MLG to make changes to the requirements for granting construction and event permits. The JPS Power Education and both health care pilots were suspended indefinitely due to poor uptake by potential customers when compared with the resources needed to maintain the effort.

The decision was made to focus on those pilots demonstrating success, namely the Grand Bonanza, Ambassador, and House Wiring initiatives. Success was measured by the number of customers regularised, positive feedback from potential customers, the ability to be scaled up towards much larger regularisation targets, and achieving self-funding. The remaining three initiatives have shown promise and the utility plans to scale them up for 2022.

The biggest barrier to regularising illegal users is house wiring with over 90% of the households in the red-zone areas lacking the proper wiring. Many occupants expressed a desire to legitimise their supply but lack the financial means to wire and certify their households, with costs starting at about J$120,000 for the most basic installation.

Strike Force

Strike force is a special unit of technicians that are trained and equipped to operate in high-risk areas, typically alongside the police. These areas, called red-zones, are characterized by high levels of theft, significant risk of violence and depressed socioeconomic conditions. The strike force provides support to other teams, like community renewal, with operations in these areas but also operates autonomously to investigate, remove illegal connections, and regularize customers.

The restrictions, curfews and unavailability of the police due to circumstances surrounding the pandemic caused the Strike Force to operate at partial capacity. There were 1,618 customers regularized compared to a 2,250 target, 232,529 illegal throw-ups removed compared to the target of 250,000, and 81 arrests made in 2021. Operations continued to be affected by the pandemic with an increase in sick days.

5.2.1.2 Lobbying Rule Changes

In the 2019 rate case submission, JPS explained that the perceived severity of punishment is an important consideration when individuals decide to steal electricity. The current tools available to the utility are woefully inadequate for reasons outlined in that submission. The utility made several proposals aimed at improving the ability of the government to independently police theft, process criminal cases related to theft, and prescribe harsher punishments for violations. The utility met with the Minister of Justice and made representations to the Joint Select Committee looking at reviewing the Electricity Act, 2015. The following is a summary of the proposals:

- A special utility court to increase the rate at which cases can be processed or special court dates to address utility matters.
- Legal language acknowledging the critical infrastructure status of the electricity grid, and more severely punishing unauthorised interference.
- Training police to detect electricity theft, collect, and present evidence in criminal cases.

There have not been any firm commitments towards implementing any of these proposals as at the end of 2021.

5.3 Performance Drivers and Challenges

Electricity theft is the main driver for the high levels of system losses, which has increased because of direct and indirect effects of the pandemic. The Jamaican economy has weakened because of government directives meant to manage the pandemic. This has resulted in a shift in individual behaviours, leading to increased propensity and severity of theft. The consequences of economic changes on theft was captured in the behavioural model proposed in the 2019 rate case submission as one of five aspects driving electricity theft:

1. Social Attitudes
2. Economics
3. Availability of Means
4. Perceived Likelihood of Discovery
5. Perceived Severity of Punishment

Increased unemployment, curfews, work-from-home policies, and virtual classrooms are some features of the socioeconomic climate, which contributed to the increase in residential demand. This was coupled with declining incomes due to unemployment and a weakened economy. The net result was that electricity was a bigger portion of household income. Another factor is that this demand largely came at the expense of commercial and industrial demand. Residential customers have a higher propensity to steal and theft is less detectable, so a redistribution of demand has negative consequences for losses.

The pandemic has also affected global supply chains, which in turn affected the availability of materials used in loss reduction activities. There were significant challenges particularly with securing smart and RAMI meters. This affected the RAMI and smart meter initiatives, which relied on the installation of new metering infrastructure. The shortage also affected routine audits particularly in cases where defective or damaged meters could not be replaced.

5.4 System Loss Performance Outlook for 2022

5.4.1 Objectives and Strategies

Technical Loss

For 2022, JPS plans to execute two (2) major projects to reduce system technical losses. The first project is the continuation of the voltage standardization programme where two (2) additional feeders will be converted from 12 kV to 24 kV, namely, the New Michelton Halt 210 and 310 feeders in St. Catherine. The target annual technical loss reduction of 2,595 MWh is to be realized starting in 2023.

The second project is the installation and commissioning of 40 MVAR of medium-voltage substation capacitor banks in the Corporate Area. The target annual technical loss reduction of 603 MWh is to also be realized starting in 2023.

Table 5-8 shows a summary of the expected impact for the 2022 technical loss reduction initiatives.

Table 5-8: Summary of technical loss reduction initiatives for 2022

Initiative	MWh Loss Reduction
Voltage Standardization	2,595
Capacitor Bank Project (Corporate Area)	603
Total	3,198

Non-Technical Loss

JPS plans to expand its existing initiatives, particularly focusing on the social initiatives that showed promising results. *Table 5-9* below shows a summary of the expected loss reduction for the initiatives planned for 2022.

Table 5-9: Summary of non-technical loss reduction initiatives for 2022

Initiative	MWh Loss Reduction
RAMI	18,000
Audits & Investigations	17,000
Smart Meters	
Community Renewal, Strike Force	18,000
Total	53,000

RAMI

Three project areas originally planned for completion in 2021 are now planned for completion in 2022. There are three new project areas planned for 2022 for six total project areas to be completed in 2022. Table 5-10 summarises the expected benefits from the six project areas that will be reported in 2023.

Table 5-10: Summary of expected project benefits

Project Area	Pre-Project Loss Rate	Planned Post-Project Loss Rate	Planned Monthly Reduction (MWh)
Grants Pen Phase 1	61%	15%	102
Lilliput Phase 1	65%	15%	115
Steer Town	68%	15%	230
Tower Hill Phase 1	76%	15%	165
August Town Phase 2	72%	15%	78
Granville	68%	15%	68
			758

The expected benefit would be about 758 MWh per month in loss reduction.

Community Renewal

The Community Renewal plans for 2022 are focused on operationalising the 2021 social intervention pilots that showed signs of success. The table below shows a summary of the scope for 2022.

Table 5-11: Summary of Community Renewal Initiatives

Pilot Initiative	Loss Reduction (MWh)	Customers Regularized
Ambassador	1,680	1,700
Grand Bonanza	3,383	3,000
House Wiring	1,657	1,500
Total	6,720	6,200

House Wiring

Legitimate supply requires that a house is wired by an authorized electrician and certified by the Government Electrical Regulator (GER). The cost to wire a house is significant and is prohibitive to many Jamaicans, particularly those in vulnerable communities. This makes the economics of legitimate supply less appealing than the alternative and this is a major factor why some choose to steal, despite expressing a willingness to regularize. The Jamaica Social Investment Fund (JSIF)

has undertaken a project to wire 1,500 houses annually and JPS has collaborated with them to suggest project areas that overlap with Community Renewal project areas. Once households are afforded the means for legitimate supply, JPS is able to follow up with its other social programs to encourage legitimate supply.

Notwithstanding, JPS recognises that house wiring is a big barrier for converting illegal users to legitimate customers. The utility is also planning to implement several additional initiatives aimed at reducing this barrier:

- JPS facilitating the wiring of 10,000 households in 2023. This proposal will be sent to the regulator for their approval primarily in regards to funding.
- Employing in-house technicians to wire houses at more competitive labour rates.
- Training of inspectors with HEART Trust NTA to improve the supply of inspectors and reduce costs.
- Donating materials for use in house wiring projects.
- Exploring partnerships with micro-financing agencies to support house-wiring loans.

Grand Bonanza and Ambassador

The grand bonanza will be revamped and scaled up in 2022. The communication strategy has been expanded, and the amounts and frequency of prizes is being revised to increase and sustain interest in the initiative. The expected loss avoidance is about 3.4 GWh from about 3,000 regularised customers.

The project areas in which the ambassador initiative will be operational will be expanded from 7 to 12. The compensation package has also been revised to improve ambassador retention.

Smart Meters

The long-term plan is to change out the majority of meters to smart meters by 2024. The plan for 2022 is to install 65,500 revenue and 4,000 transformer meters. The revenue meters are to be installed in Westmoreland and St Ann while the transformers will also be installed in other areas to help facilitate the energy balance.

Audits and Investigations

The transformer energy balance is expected to be the primary driver of audits in 2022. The energy balance is a direct measurement of the losses on a transformer circuit, which typically has about 30 customers, using smart transformer and customer metering. There are about 30,000 customers currently participating in the transformer energy balance. This is planned to increase to 100,000 primarily residential customers by the end of 2022.

About 75,000 audits are expected in 2021 with 17 GWh in associated loss reduction and recoveries.

Key Partnerships

The pandemic has made it painfully clear that system losses is a phenomenon subject to strong forces external to JPS, especially so for non-technical losses. It is in customers' and indeed the country's best interests that other stakeholders like the Government be engaged and encouraged to

participate in managing non-technical losses. JPS has and continues to advocate for a national response to this problem and consequently has collaborated with other organizations to advance this response.

National Electricity Loss Reduction Plan

The Inter-American Development Bank (IDB) is facilitating a consortium including JPS, the Office, and the Government with the common goal of crafting a national plan for reducing system losses. This National Electricity Loss Reduction Plan (NELRP) involves a comprehensive audit of the circumstances surrounding system losses. This includes measuring different components of losses, evaluating JPS' systems and processes, and the effectiveness of public institutions like law enforcement, the legislature and the judiciary.

The NELRP will provide a roadmap of activities, investments, and targets that will enable the effective reduction of system losses. Importantly, it will also define the roles and responsibilities of the various participants. Currently, external consultants are being evaluated for selection and the completed plan is expected in early 2022.

Loss Reduction Working Group

This is a working group hosted and funded by the United States Agency for International Development (USAID) consisting of MSET, JPS, the Office, JSIF and other advisory agents. The goal is to prepare and implement a short-term, coordinated, sector-wide plan for electricity loss reduction, particularly focusing on community engagement through social programs. House wiring was selected as a major barrier to loss reduction in vulnerable areas and the working group is currently working on expanding the house wiring support for vulnerable households in 2022.

5.5 Key Considerations

5.5.1 Performance Projections and Suggested Targets

JPS expects its initiatives to reduce non-technical losses by 53 GWh. The Company anticipates a demand of 4,387 GWh and sales of 3,180 GWh. Therefore, JPS proposes the following losses targets for the 2022 calendar year.

Table 5-12: System loss target for 2022

System Loss Component	Target
Technical loss	7.90%
Non-technical loss fully within the control of JPS	6.89%
Non-technical loss not fully within the control of JPS	12.71%
Total	27.50%

JPS maintains its proposed 10% responsibility factor for the same reasons outlined in the 2019 application. Additionally, 90% of illegal users cannot be regularised without proper house wiring and certification, which is firmly not the responsibility of the utility.

JPS has not revised its mechanism for determining responsibility proposed in its 2019 application. NTL is split into aspects deemed fully within the control of JPS and aspects not fully within the control of JPS according to the level of smart meter coverage.

5.6 2019-2024 Rate Determination Requests and Concerns

5.6.1 Target Setting Mechanism

Transparency

JPS has developed a theory that is used to understand the drivers of non-technical losses. JPS evaluated its ability to impact system losses using this understanding and develop plans accordingly. A critical requirement to make effective plans is understanding what the Company is trying to change and how it impacts system losses. The Licence establishes a system where the Office evaluates system loss performance, sets reasonable and achievable targets after which JPS and the Government implement activities necessary to reduce system losses. This system falls apart if there is no shared understanding among the participants.

JPS advocates for the Office to provide detailed evidence, rational and justifications for its positions and targets. Such clarity provides the opportunity for JPS to adjust its plans to tackle specific issues in a manner consistent with the Office's view or to challenge and improve the Office's positions. Ultimately it can only benefit the customer if roles are transparent, well-understood, and well matched to the appropriate entity.

Unreasonable Targets

JPS has repeatedly argued that the targets prescribed by the Office do not reflect realistic conditions and 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 should be reasonable and achievable. The targets prescribed by the Office are some of the most aggressive seen internationally, considering resources and the lack of the national response seen elsewhere. Indeed, the Office participated in a workshop in 2015 hosted by the USAID which revealed that most regulators set targets within 5-10% of actuals, whereas the Office's targets tend upwards of 14% more aggressive than actuals. These were the experiences of utilities in 7 other countries that enjoyed significant social and legal reforms to support loss reduction.

The past 4 years prior to the pandemic were some of the most successful in JPS' history given its operating environment. There was sustained reduction in the rate of system losses while managing bad debt. The reductions averaged 0.90% or 0.20 – 0.30 percentage points each year. There is no historical evidence to support a reduction in the rate of system losses on the order of 14% or 3.68 percentage points in one year. This is what was expected by the OUR in 2019.

Contradictorily, the Office itself presented arguments and projects which questioned the likelihood or ability to achieve those targets in the same document. Section14.114 of the 2019-2024 Rate Review Determination argues that a reduction of 1.49 percentage points would "likely be

impractical in the 12-month period" in relation to residential customers in 2017. The residential customers make up 96% of the losses, as reported by the Energy Loss Spectrum, for which the Office has set a target. The Office's 2019 JNTL target of 4.07% would require a reduction of 1.95 percentage points, almost all of which would come from reductions in the residential category.

Further evidence that the Office doubts the achievability of its own targets include the projected system loss performance in table 14.22. These projections show that the Office expects system loss to remain significantly higher than the targets that it has set. Other inconsistencies include the abnormal first year targets that the Office has been prescribing. In 2019, given an actual system loss of 26.05% and a target of 22.37%, a reduction of 3.68 percentage points is expected. Subsequent years, however, require much lower reductions of between 1.14 to 0.27 percentage points. The Office has not indicated why 2019 is special and should require between 3 to 13 times the reductions expected in the other years.

Retroactive Targets

JPS received the 2019-2024 Rate Review Determination Notice on December 24, 2020, over one year late. That determination contained the formal targets for the five-year regulatory period, which includes 2019 which had already ended and 2020 which was a week away from concluding. This amounted to retroactive targets for 2019 and 2020. The Licence stipulates that all targets should be reasonable and achievable, but JPS is not aware of any mechanism or action that could be undertaken to impact past events. Consequently, the targets prescribed in the 2019-2024 Rate Review Determination Notice are impossible to achieve and therefore violate the requirements of the Licence.

Suitability of the Energy Loss Spectrum

JPS communicated the serious concerns about the Energy Loss Spectrum ("ELS" or "the Spectrum") in its 2019 application. These concerns centred on the use of the non-technical losses categories to set targets and measure performance. The loss modelled in the non-technical loss categories are disconnected from reality. It was noted that use of such a report was unusual given the technical challenges involved in creating an accurate report and the questionable benefits it would provide to the target setting process. Instead, JPS has proposed an alternative mechanism in its 2019 application, which uses the coverage of smart meters to characterize the level of control available to JPS. JPS continues to advocate for this or a similar approach which uses verifiable and mutually available variables to set targets.

5.7 Conclusion

High system losses, driven mainly by electricity theft, continues to be a problem plaguing the country. The utility has and continues to try different approaches to reduce theft but progress is slow and hard won. The pandemic has made clear just how much of this is outside of the control of the utility. Despite the economic burden to the entire country, this continues to be a problem largely left to the utility to tackle. Changes to the electricity infrastructure to reduce opportunities for theft are prohibitively expensive.. Thus, solutions are oriented towards changing and restricting the behaviour of the public.

Briefly, the utility believes that the following factors are evaluated on an individual level when persons make the choice to steal:

- Social attitudes
- Economics
- Ease of theft
- Perceptions about getting caught and formally punished

These problems are largely outside of JPS' control as argued in the previous submissions, but the utility continues to do its part and encourages the participation of relevant stakeholders. The utility believes that it is in the best interest of its customers and indeed the entire country if all stakeholders treat electricity theft with the same importance, urgency and afford the same resources as other issues with such far-reaching consequences. The utility continues to lobby and encourage the various stakeholders to become more involved and to leverage their authority and resources.

In order to achieve these worthy goals, it is imperative that the Government, the regulator and JPS are on the same page. This national partnership must value transparency and cooperation as a core tenet. Specifically:

- The Government's role should be clearly articulated and always recognized in discussions and documents related to system losses.
- The derivation of any quantity, whether target or otherwise, should not be secret. Instead, information and insight sharing should be valued.
- An objective and fair mechanism to measure and set targets should be established, replacing the current mechanism that uses the flawed ELS.

JPS believes that these are some of the prerequisite steps of any serious attempt to manage this problem. Otherwise, the lack of coordination and misunderstood or ill-suited roles will result in little to no long-term improvements.

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:

1. The price of fuel consumed by JPS thermal plants;
2. The fuel conversion efficiencies (Heat Rates) of these plants;
3. The amount of electricity generated by JPS' various generating plants; and
4. 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 to bill 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 the 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 provides 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 JPS Heat Rate target (thermal) to JPS Heat Rate actual (thermal) which is used in the fuel pass-through formula as follows:

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

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:

1. The targets should hold JPS accountable for the factors which are under its direct control;
2. The targets should encourage optimal generation dispatch of the available generating units to minimize the total cost of electricity generation;
3. The targets should take into account legitimate system constraints provided that JPS is taking reasonable action to mitigate these constraints;
4. 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
5. The targets should be reasonable and achievable and consistent with the configuration and capability of the system during the target period.

The establishment of 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):

1. 2020–2021 Annual Review: 9,675 kJ/kWh
2. 2021–2022 Annual Review: 9,667 kJ/kWh
3. **2022–2023 Annual Review: 9,495 kJ/kWh**
4. 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 2022/23 regulatory year compared to the OUR determined targets. The projected forecast takes into account 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 2021 and identifies the factors outside of JPS' control, which affected its fuel conversion efficiency performance.

6.2 JPS Heat Rate Performance for 2021/22

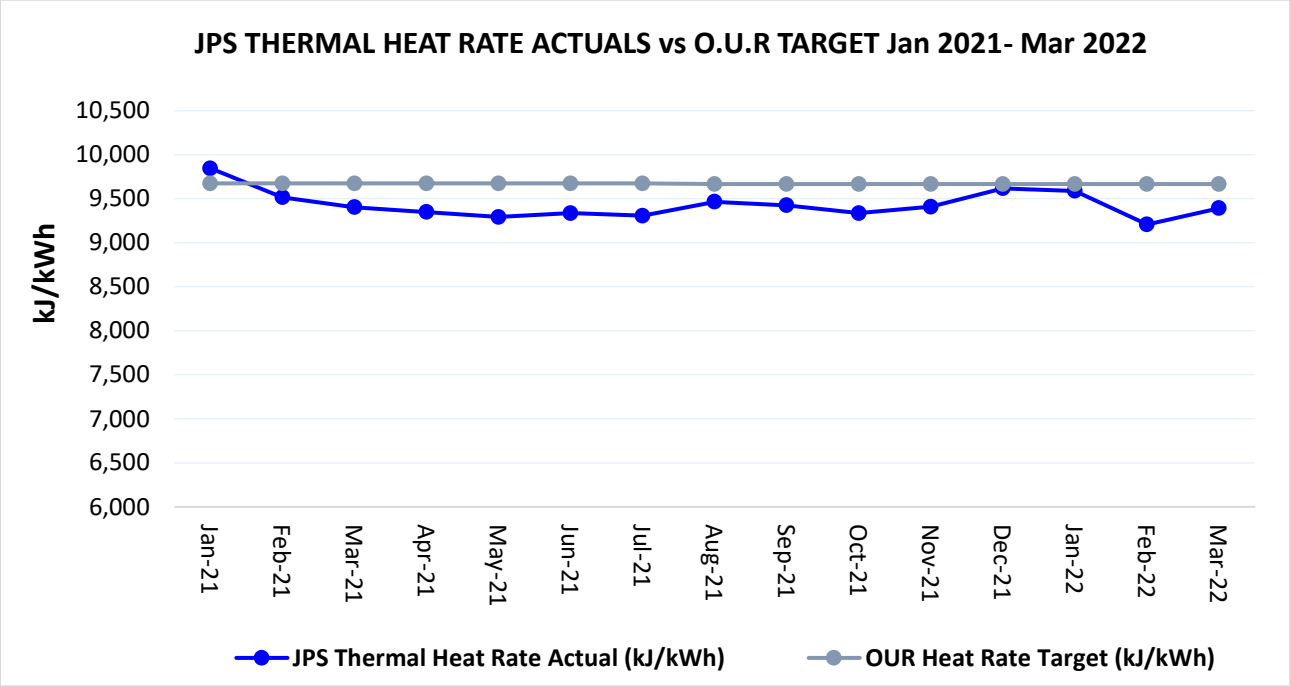
The JPS thermal heat rate for 2021 was 9,442kJ/kWh. When compared to 2020, this performance represents an improvement of 820kJ/kWh or 8%. The major contributors to this improvement were the retirement of Hunts Bay B6 68.5MW steam turbine generator and the prudent maintenance activities carried out on the JPS generation assets. The monthly heat rate performance ranged from a high of 9,846kJ/kWh in January 2021 to a low of 9,294kJ/kWh in May 2021. *Table 6-1* is the summary of JPS' thermal heat rate performance compared to the OUR's target over the period Jan 2021 to March 2022. The target was changed in August from 9,675kJ/kWh to 9,667kJ/kWh.

Table 6-1:JPS' heat rate performance versus target from Jan 2021 to Mar 2022

Month	JPS Thermal Heat Rate Actual (kJ/kWh)	OUR Heat Rate Target (kJ/kWh)	Variance from Target (kJ/kWh)
Jan-21	9,846	9,675	-171
Feb-21	9,516	9,675	159
Mar-21	9,403	9,675	272
Apr-21	9,350	9,675	325
May-21	9,294	9,675	381
Jun-21	9,336	9,675	339
Jul-21	9,308	9,675	367
Aug-21	9,466	9,667	201
Sep-21	9,426	9,667	241
Oct-21	9,337	9,667	330
Nov-21	9,409	9,667	258
Dec-21	9,618	9,667	49
Jan-22	9,590	9,667	77
Feb-22	9,208	9,667	459
Mar-22	9,393	9,667	274

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 2021 to March 2022.

Figure 6-1: JPS Thermal Heat Rate Performance vs Target, Jan 2021 to Mar 2022



JPS Key Performance Indicators Overview - 2021

The system net generation for the year 2021 ended 2% higher than 2020 (4,304GWh vs 4,228GWh). Despite the growth, the 2021 net generation was 1% below the expected demand of 4,349GWh, a signal of the slower than planned recovery from the COVID-19 pandemic. The month of July recorded the highest net generation (384,319MWh) and peak demand (631.6MW). This peak demand is 6.4MW (1%) lower than that recorded in 2020 and is the second-lowest observed since 2015, a testament to the continued impact of the novel coronavirus. In terms of reliability KPIs, JPS' Equivalent Availability Factor (EAF) ended at 88% whilst the Equivalent Forced Outage Rate (EFOR) ended at 11%. *Table 6-2Table 6-1* below provides the results of the Key Performance Indicators for the JPS Generation Fleet.

Table 6-2: JPS Key Performance Indicator (KPIs) 2020 – 2021 (Calendar year)

Operating Metrics	2020	2021
JPS Thermal Units (kJ/kWh)	10,262	9,442
Net Generation GWh	4,228	4,304
Peak Demand MW	638	631.6
JPS EAF	85%	88%
JPS EFOR	11%	11%

6.3 Factors Impacting JPS Heat Rate Forecast 2022/23

Low Energy Demand due to Covid-19

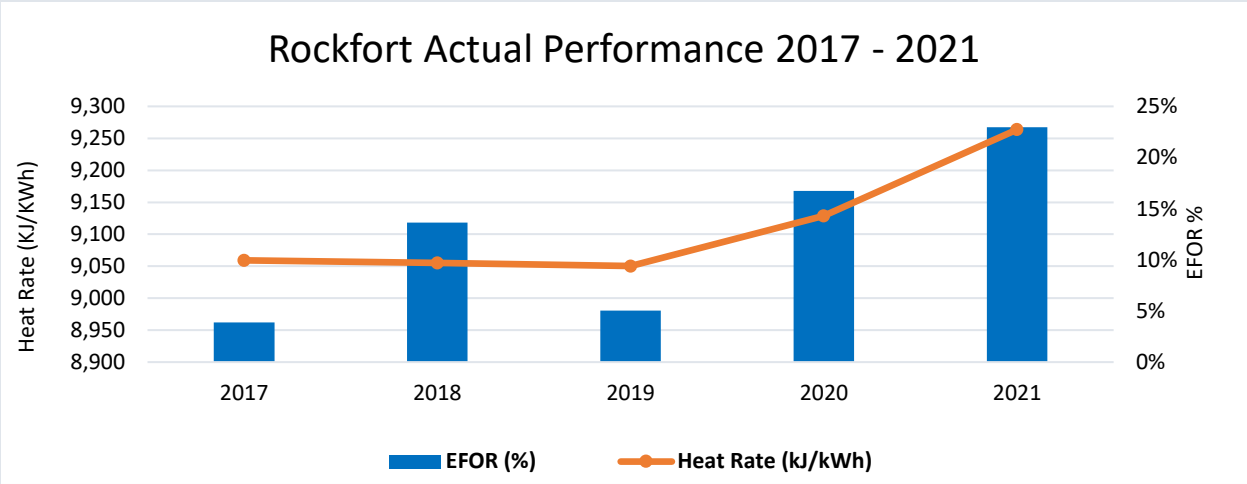
The current pandemic continues to significantly disrupt the demand for electricity across the island. In 2021, the country experienced its second lowest peak demand in five years and net generation 2.8% behind the pre-pandemic level of 4,429.475 GWh (2019). This low demand impacted JPS's utilization of its thermal generation assets, primarily the Bogue CCGT which is JPS' largest and most efficient generating asset. The demand lost on the Duncan's to Bogue Node (large load driven by consumption from hotels) contributed to the Bogue CCGT plant falling from above 78% capacity factor pre-pandemic to 72% capacity factor in 2021. Despite the Company's efforts in maintaining the CCGT in an efficient state, the low demand has caused a worsening of approximately 177kJ/kWh on the CCGT heat rate above its pre-pandemic performance of just above 9,000kJ/kWh. This heat rate deterioration was also affected by higher than projected renewable production, the variability of which further negatively impacted the efficient dispatch of this plant. These are events outside of JPS's control that significantly affect the JPS thermal heat rate performance. See figure3 for more details.

State of JPS's Key Generating Plants

Another major impact on JPS' thermal heat rate performance is the age of its assets. One plant of particular concern is the Rockfort Diesel Plant. This plant is in its 37th year of operation and has major components that are now at or near end of life. Of particular concern are the turbochargers on both units which were last upgraded ~14 years ago. The turbochargers have a guaranteed useful life of 10 years. These turbochargers are key in keeping the Rockfort units at 20MW MCR. With the expected and ongoing deterioration of these turbochargers on both units, the efficiency will continue to deteriorate towards retirement.

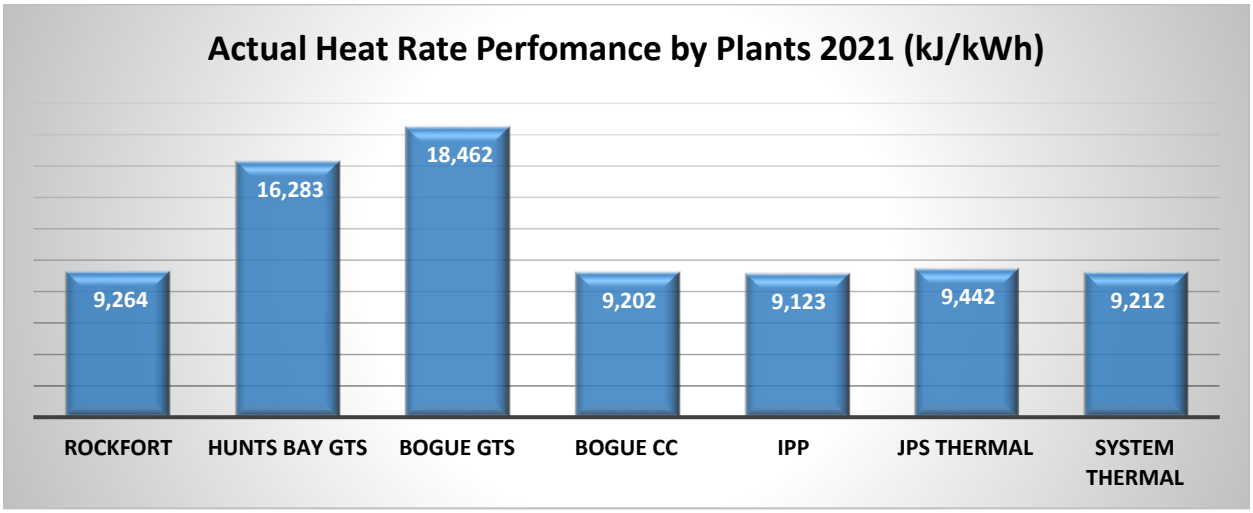
The sulphur content in the heavy fuel oil used by Rockfort is another negative impactor on the plants' performance. There has been a global shift to low sulphur fuel utilization driven by the MARPOL (International Convention for the Prevention of Pollution from Ships). The resulting Low Sulphur (0.50%) regulations took effect on January 1, 2020. Consequently, PETROJAM switched to the importation and utilization of low sulphur crude in their refinery operations. Since the introduction of this low sulphur fuel oil, the Rockfort engines have experienced a notable increase in EFOR due to high cylinder wall temperatures. This is illustrated in *Figure 6-2* below which shows Rockfort's actual performance over the last five years.

Figure 6-2: Rockfort Actual Performance 2017 - 2021



It must be noted that JPS' contracted specification for fuel to be supplied by Petrojam was for the sulphur content to not exceed 3%. This specification allowed Petrojam to supply this new fuel oil with much lower sulphur content. The continued use of this new fuel oil resulted in the Rockfort units experiencing high cylinder wall temperatures in 2021. In order to prevent a catastrophic failure, both units have been derated. These derates coupled with the deterioration of the turbochargers and other components on these units, has contributed to the heat rate on both units deteriorating from close to 9,070kJ/kWh to above 9,200kJ/KWh. *Figure 6-3* below outlines the actual heat rate performance of each plant in 2021. The performance illustrated conveys the impact that Covid-19 and equipment deteriorations have had on JPS' key baseload plants and the overall JPS thermal heat rate performance.

Figure 6-3: JPS Thermal Fleet Actual Heat Rate Performance 2021



6.4 JPS Heat Rate Performance Forecast for 2022/2023

6.4.1 Model Assumption

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 in use in most regions of the world by many of the world's largest utilities and system operators.

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 units.

6.4.2 Projected Maximum Capacity Rating (MCR)

The table below shows the projected maximum capacity rating of the generating units on the system. While Rockfort's maximum capacity rating is forecasted to remain at 20 MW x 2 for the 2022 to 2023 regulatory period, the availability of the units based on derates is forecasted to be 18MW for each unit at best.

Table 6-3: System Projected Maximum Capacity Rating (MCR)

Plant	Unit	2022	2023
		MCR (MW)	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	40.00	40.00
	CCGT	40.00	40.00
	Subtotal	**213.50**	**213.50**
Munro Wind		3.00	3.00
JPS Hydro	**Subtotal**	29.59	29.59

Plant	Unit	2022	2023
		MCR (MW)	MCR (MW)
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		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 2022 to 2023

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

1. Rockfort's capacity factor is forecasted to average 76% over the period.
2. Hunts Bay's gas turbines capacity factor is forecasted to average 3% during the period.
3. Bogue's capacity factor is forecasted to average 36% for the review period. This is inclusive of a major overhaul on Bogue ST14, which is projected to span over a two-month period.
4. JPS Hydro Renewables capacity factor is forecasted to average 54% for the 2022 to 2023 regulatory period. This is inclusive of a major overhaul on the Lower White River Hydro.
5. The capacity factor for the wind farms in the system are as follows: Wigton I: 30%; Wigton II: 34%; Wigton III: 24%; JPS Munro: 13% and Blue Mountain Renewables: 39%. With respect to the current two solar farms, the capacity factors are as follows: Eight Rivers: 24% and WRG Solar 24%.
6. The total IPP's capacity factor forecasted for the 2022 to 2023 regulatory period is 60%.
    a. The overall system capacity factor forecasted for 2022 to 2023 regulatory period is 47%.

Forecasted Energy Production

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

1. Rockfort's energy production is forecasted at 266GWh for the 2022/23 period.
2. Hunts Bay's gas turbines energy production is forecasted at 16GWh for 2022/23.

3. Bogue's energy production is forecasted at 690GWh for 2022/23. This is inclusive of a 45 days' major maintenance outage on Bogue Steam Turbine (ST14) in Q4, 2022 and a Hot gas path inspection on Bogue GT12 in June 2023. Energy production for the Bogue peaking units is forecasted at 25GWh for 2022/23. This mainly due to Bogue GT11 being dispatched at high levels during Bogue ST14 major overhaul.
4. JPS Hydro Renewables energy production is forecasted at 141GWh for 2022/23. Energy production for Wind farms: BMR 115GWh, Wigton 156GWh and Munro 3.3GWh, and the Solar Farms: WRB Solar 42GWh and Eight Rivers Solar 79GWh.
5. IPP's Thermal energy production is forecasted at 2,896GWh for 2022/23.
6. The overall system demand is forecasted to be 4,407GWh.

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 typical factors are provided below.

1. Growth in system demand;
2. The addition of more renewables;
3. The addition of new generating units and the installed reserve margin;
4. Heat rate improvements made to existing generating units;
5. Availability and reliability of JPS generators;
6. Availability and reliability of IPP generators;
7. Absolute and relative fuel prices for JPS and the IPPs and the impact on economic dispatch;
8. Spinning reserve policy;
9. Network constraints and contingencies.

6.5.1 The forecasted heat rate by plants for the 2022/23 regulatory period:

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

1. Rockfort is forecasted at 9,236 kJ/kWh. With a Major maintenance outage on Unit#1 in February 2023.
2. Hunts Bay gas turbines are forecasted at 18,137kJ/kWh which is reflective of their peaking duties.
3. Bogue Combined Cycle Plant is forecasted at 9,376kJ/kWh. This is mainly due to the 45 Days Major Overhaul that is scheduled on ST14 in Q4 2022. Bogue gas turbines GT#3-GT#11 are forecasted at 13,565kJ/kWh as per their peaking duties.
4. IPPs are forecasted at 9,046 kJ/kWh with SPH CHP operating as take as available as well as Major Maintenance outages SJPC units.

6.5.2 Key Considerations

In revising the heat rate target, proper consideration must be given to the following:

7) The most recent operating key performance indicators (Heat Rate, Cap Factor, EFOR, EAF) of JPS key baseload units.
8) The direct and indirect effects of the COVID-19 pandemic on the load demand.
9) The 45 days planned outage of JPS most efficient unit (Bogue ST14).
10) The 28 days planned Hot Gas Path inspection ~~in~~ on Bogue GT12.
11) The Rockfort units heat rate deterioration and low sulfur fuel impact.
12) A reasonable buffer to alleviate the impact that higher than planned forced outages on the IPP units have on JPS' heat rate performance due to the running of less efficient units (peakers) to maintain system reliability and minimize load shedding.

The major overhaul (MOH) on Bogue ST14 was scheduled to commence in February 2022 however, it was rescheduled to commence in October 2022 due to logistics supply chain issues. A critical part of this MOH is the replacement of the obsolete control system. This delay was mainly due to the manufacturers of the new controls system and spare parts facing difficulties in receiving the necessary raw materials.

During this major overhaul, only the Steam Turbine and its connected auxiliaries will be undergoing major maintenance. The gas turbines (GT12 and GT 13) will be made available to the grid for dispatch in simple cycle mode. Based on historical performance, when similar activities are undertaken, and the latest dispatch forecast, Bogue GTs #11,12 &13 will be required to operate to serve the demand as well as provide voltage and frequency support on the Transmission Grid based on their position in the merit order as well as location on the north-western end of the island. The Company's projections at this time are that these gas turbines will be utilised during this period of this major maintenance.

As such, in keeping with the requirements of Schedule 3 paragraph 37 of the Licence, the Heat Rate target must consider the effect of the Bogue CCGT Steam Turbine (ST14) major maintenance outage. Based on the current forecast for this period, JPS' Thermal Heat Rate is expected to average 11,097kJ/kWh for the two months the steam plant is offline. JPS is requesting that the 2022/2023 heat rate target be revised to account for this major Maintenance activity on Bogue ST14.

The age of JPS' assets is another key impact that should be taken into consideration, especially the age of Rockfort Power Station. The diesel engines at Rockfort are in the 37th year of operation and have major components that are now obsolete and at their end of life. Of particular concern are the turbochargers which were last upgraded ~14 years ago (useful lives is 10 years). In addition to the impact of these ageing turbochargers, is the impact of the low fuel sulphur on the asset performance due to higher cylinder liner wall temperature, see Figure 2 above for Rockfort actual performance 2017- 2021. With this in mind, JPS is requesting that the OUR adjust the heat rate target for the period 2022-2023 to reflect these known risks.

The impact of the pandemic and the variability of renewables are factors outside of JPS' control that must be considered in the target setting process. The performance of Bogue CCGT is of particular concern as the demand lost on the Duncan's to Bogue Node (largely hotel load) has

caused the CCGT to fall from above 80% capacity factor to 72% capacity factor in the last year. This translates to the CCGT heat rate deteriorating from 9,000kJ/kWh to over 9,200kJ/kWh. The lower utilization of this asset significantly impacts the efficiency of this unit. The Bogue CCGT based on design and operation is most efficient at capacity factors above 85%. As a result, the lower the capacity factor the worst the efficiency will be. JPS is requesting a revisit of the heat rate target for 2022/23 to better reflect the actual performance of the CCGT (in relation to the impacts of the pandemic) as well as the plant operating in droop mode to mitigate against the impacts of renewable intermittency on system frequency.

The Impact of Independent Power Producers' (IPP's) Performance -The availability and reliability of IPPs have a direct effect on JPS's thermal & the overall system heat rate. In the current landscape IPPs accounts for more than 65% of the generating capacity on the grid. The expected performance of IPPs is defined in their Power Purchase Agreements. Each IPP is allowed planned and forced outage hours and by extension is required to perform with a forecasted level of availability and reliability. To the extent that the required IPP performance is not realized, JPS is forced to operate its less fuel-efficient (peaking units with worse heat rate) units to stabilize the grid and prevent significant load shedding incidents. This in turn negatively affects the expected JPS Thermal & System heat rate. This fact must be taken into consideration when revising the 2022- 2023 Heat Rate target.

6.5.3 Proposed Regulatory Targets

Table 6-4: Results of JPS Forecasted Thermal Heat Rate Model, July 2022 to June 2023

Heat Rate (kJ/kWh)	22-Jul	22-Aug	22-Sep	22-Oct	22-Nov	22-Dec	23-Jan	23-Feb	23-Mar	23-Apr	23-May	23-Jun	Year
JPS Thermal (2022\23)	9,426	9,368	9,349	11,923	10,272	9,355	9,320	9,499	9,356	9,347	9,406	9,647	**9,589**

Based on the heat rate performance obtained from JPS' updated forecasted model for July 2022 to June 2023, JPS' thermal heat rate is projected to finish at **9,589kJ/kWh**. When compared to the current proposed regulatory target of 9,495kJ/kWh for the period, JPS' heat rate performance would be 94kJ/kWh worse than the target. This will yield a significant under-recovery of fuel costs over the period.

In keeping with the principle of FCAM, JPS is proposing that the JPS Thermal heat rate target for July 2022 –June 2023 be revised from 9,495kJ/kWh to **9,791kJ/kWh** to account for the impact of Bogue ST14 Major overhaul as well as the other known factors that continue to impact JPS' Thermal performance. The proposed target includes a small buffer to account for potential forced outages and other operational challenges that may occur but have not been included in the forecast.

7. Tariff Design

7.1 Introduction

JPS' 2022 Rate Proposal

The following sections outline JPS' proposed 2022-23 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 2022 in keeping with the 2019 Final Determination and adjusted for known economic and performance factors as per the Annual Adjustment Mechanism stipulated by the Licence. 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.

7.1.1 2021 Review

The Jamaican economy showed signs of recovery during 2021, the second – full year of the SARS-CoV-2 global pandemic when compared to 2020, the year of the emergence of the pandemic. The recovery is evidenced by the registered calendar year real growth of 4.4% percent relative to the decline of 10.2% in 2020. Despite the uptick in growth across most economic sectors during 2021, the economy has not yet regained all pandemic-related GDP losses. This is also evident in JPS' total recorded energy sales during 2021 (2,977 GWh) which remained below pre-pandemic levels in 2019 (3,158 GWh), and slightly above the 2,938 GWh recorded in 2020.

7.1.1.1 2021 Sales Performance

JPS recorded a total of 2,977 GWh in electricity billed sales during the year. This represented an increase of approximately 1.3% relative to prior year. This improvement was driven by the growth experienced by large commercial and industrial customers as economic activity returned to some semblance of normalcy in key industries. RT50 sales saw an increase of 3.67% and RT70 saw a significant increase of 24.5%, an increase of approximately 11 GWh and 56 GWh respectively.

Residential consumption declined by 15.5GWh or 1.4% as households returned to the office and schools. Small commercial customer sales recorded a decline of 1.5% or approximately 8 GWh compared to 2020. The streetlight segment continues to decline as expected as result of the ongoing Smart Streetlight programme, consumption declined by 2GWh or 4%.

Energy sales relative to the target performance as projected by the OUR for 2021 was similar with only a 0.6% variance or approximately 18 GWh less on aggregate. The variance was driven by weaker sales than anticipate for the small and large commercial customer, i.e., RT20, RT40 and RT50. Sales performance for RT70 customer was better than expected by approximately 33 GWh or 13%.

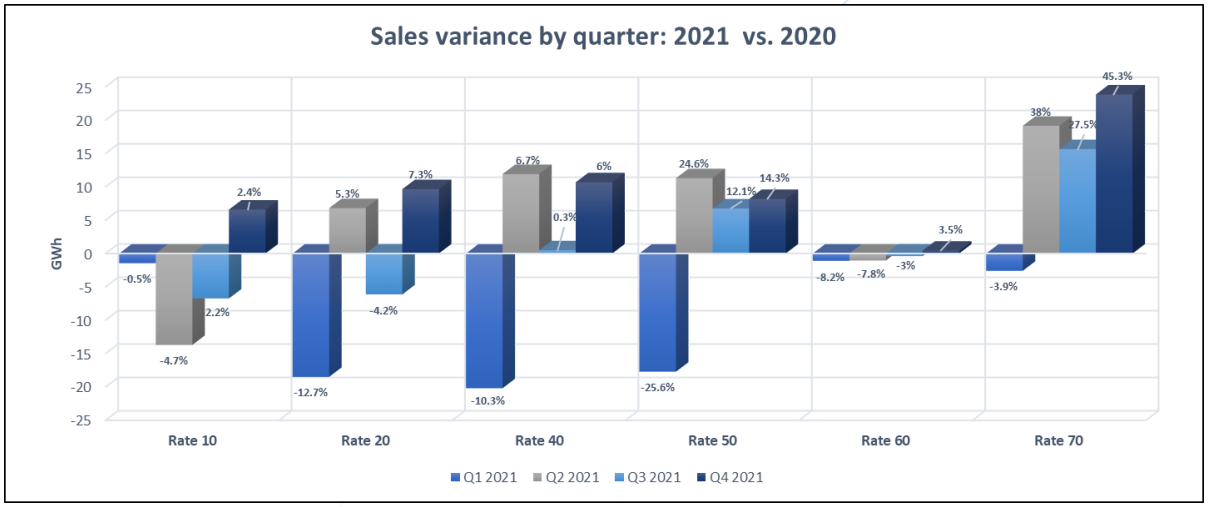
Table 7-1 below provides a summary of the recorded sales relative to the prior year.

Table 7-1: Billed Sales Performance 2021 vs 2020

Rate Class	2020 JPS Actual (GWh)	2021 JPS Actual (GWh)	2021 OUR Target (GWh)	PS 2020 *vs* 2021 Actual		JPS 2021 vs OUR Det	
				GWh	% Change	GWh	% Variance
RT10	1139	1123	1129	(15.5)	-1.4%	-6.07	-0.5%
RT20	554	546	560	(8.2)	-1.5%	-14.43	-2.6%
RT40	741	741	765	0.0	0.0%	-24.51	-3.2%
RT50	228	236	243	8.4	3.7%	-6.70	-2.8%
RT60	52	49	49	(2.1)	-4.1%	0.03	0.1%
RT70	226	282	249	56.0	24.8%	33.31	13.4%
Total	**2,939**	**2,977**	**2,996**	**38.60**	**1.3%**	**(18.4)**	**-0.6%**

Values exclude Caribbean Cement Company Ltd

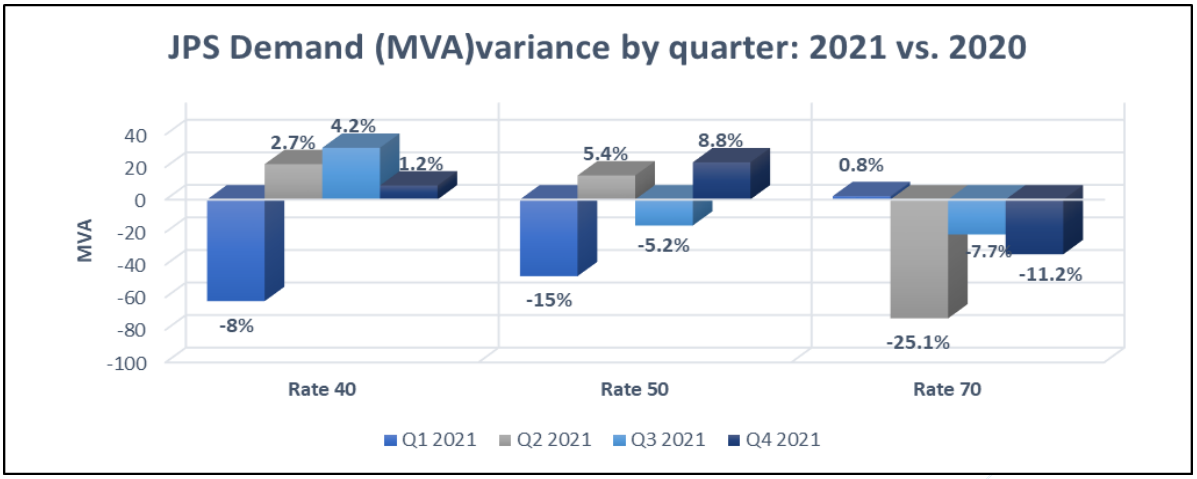
***Figure 7-1: Sales (GWh) volume comparison* by quarter for 2021 vs 2020**



Residential energy sales experienced an average decline of 2.5% across the first three quarters of 2021 compared to 2020. The category recovered in Q4 with realized growth of 2.4% largely owing to the relaxation of covid-19 containment measures by the Government such as lockdown measures, the work from orders and the partial resumption of face to face learning.

Commercial and industrial energy sales saw an average decline of approximately 13% in Q1 before realizing an average positive growth of 18.6%, 8.9% and 18.2% across the remaining three quarters, respectively. This uptick in commercial and industrial energy sales was primarily attributed to increased operating hours of businesses, which facilitated higher capacity utilization rates and production level and higher levels of employment, as firms either resumed or ramped up their operations facilitating increased economic activities across most economic sectors.

Figure 7-2: Demand MVA variance by Quarter for 2021 vs 2020



MVA demand recorded a decline of 2.8% (152 MWh) relative to 2020. The majority of the decline is credited to Rate 70, which saw an average decline of approximately 15% across the last three quarters of 2021. The impact of the weakened RT 70 demand was tempered by an average increase of 2.7% and 3% across for the same periods 2021 in the Rate 40 and Rate 50 categories respectively.

7.2 2022/2023 Tariff Basket Considerations

7.2.1 Foreign Exchange Adjustment Factor & the 2022 Proposed Base FX Rate

2021 represented a period of increasing fluctuation in the value of the Jamaican dollar relative to the US$, with the year ending with an average selling rate of JS$151.49, with marked monthly variance and a high of J$156.31 according as per Bank of Jamaica Data. As such, the current base exchange rate is no longer relevant to current market conditions.

Factoring the significant movement in the foreign exchange rate since the 2019 Determination Notice which established a base exchange rate of J$145: US$1 in setting the revenue cap for each year within the five-year review period, it is prudent that an adjustment be to accurately reflect the movement in the non-fuel revenues year tariffs from one regulatory period to the next. This is especially important as a Foreign Exchange Adjustment factor is already applied to customer bills on a monthly basis to reflect the variance in the base exchange rate and the market rate used for billing purposes. To capture the impact on non-fuel tariffs and the customer's overall bill an FX adjustment factor of 5.52% must be applied to the 2021 revenue cap to ensure like comparison to the 2022 revenue target.

As such the 2021 ART of J$44.578 billion has been rebased at the proposed foreign exchange base rate of J$155: US$1. It is restated as JS$47.038 billion.

The preceding sections outline the rationale and computations that accounts for FX movement in the prior regulatory period.

*Table 7-2***Error! Not a valid bookmark self-reference.** below shows the initial Revenue Target and the corresponding billing determinants as per the 2021 Final Determination Notice.

Table 7-2: Initial Revenue Target and the corresponding billing determinants as per the 2021 Final Determination Notice

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	3,938,885,054	4,012,599,128.80	-	-	-					7,951,484,183
Rate 10	LV > 100	-	12,220,684,438	-	-	-					12,220,684,438
Rate 20	LV	950,588,788	5,059,799,480	-	-	-					6,010,388,268
		-	-	-	-	-					-
Rate 40	LV - Std	171,373,083	3,970,755,363	-	-	-	6,136,456,564	-	-	-	10,278,585,010
Rate 40	LV - TOU	10,740,786	-	271,504,695	251,114,826	73,018,659	-	91,225,876	326,543,449	357,584,998	1,381,733,289
Rate 50	MV - Std	12,083,385	859,755,600	-	-	-	1,336,081,083	-	-	-	2,207,920,068
Rate 50	MV - TOU	2,205,697	-	81,648,592	82,467,462	29,804,076	-	53,912,756	150,360,340	155,107,692	555,506,615
Rate 70	MV -STD	1,917,998	879,660,064	-	-	-	1,969,116,917	-	-	-	2,850,694,979
Rate 70	MV -TOU	383,600	-	97,024,909	85,552,816	28,732,783	-	34,718,208	103,982,913	140,082,990	490,478,218
Rate 60	LV	7,269,822	604,863,268	-	-	-					612,133,090
TOTAL		**5,107,706,370**	**27,615,071,520**	**450,178,196**	**419,135,104**	**131,555,518**	**9,441,654,564**	**179,856,841**	**580,886,701**	**652,775,679**	**44,578,820,493**

Table 7-3 below shows the 2021 Target billing determinants, for the number of customers, energy sales and kVA demand.

Table 7-3: 2021 Target billing determinants for no. of customers, energy sales and kVA demand

Class		Average 2021 Customer	Energy kWh				Demand-KVA			
			Std.	Off-Peak	Part Peak	On-Peak	Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV < 100	617,023	548,123,560							
Rate 10	LV > 100	-	581,058,734							
Rate 20	LV	69,837	560,285,434							
		-	-							
Rate 40	LV - STD	1,787	651,957,994				2,241,744	-	-	-
Rate 40	LV - TOU	112	-	53,023,838	47,827,406	12,438,257		278,912	289,791	234,204
Rate 50	MV -STD	126	199,000,901				704,421	-	-	-
Rate 50	MV -TOU	23	-	19,209,831	18,912,978	6,119,423		173,188	172,350	131,746
Rate 70	MV -STD	20	204,080,440				783,298			
Rate 70	MV -TOU	4	-	20,953,956	18,009,617	5,410,619		111,089	119,431	105,012
Rate 60	S	188	48,814,594							
Rate 60	T	317	581,891							
Rate 60		**689,437**	**2,793,903,548**	**93,187,625**	**84,750,001**	**23,968,299**	**3,729,463**	**563,189**	**581,572**	**470,962**

Table 7-4 shows the approved 2021 tariffs as the quotient for each component per rate class.

Table 7-4: 2021 Approved Tariffs

Class		Customer Charge	Energy-J$/kWh				Demand-J$/KVA			
			Std.	Off-Peak	Part Peak	On-Peak	Std.	Off-Peak	Part Peak	On-Peak
Current Rates										
Rate 10	LV < 100	531.93	7.32							
Rate 10	LV > 100	531.93	21.03							
Rate 20	LV	1,134.2	9.03							
Rate 40	LV - Std	7,990.99	6.09				2,737.13			
Rate 40	LV - TOU	7,990.99		5.12	5.25	5.87		327.05	1,126.73	1,526.68
Rate 50	MV - Std	7,990.99	4.32				1,896.55			
Rate 50	MV - TOU	7,990.99		4.25	4.36	4.87		311.27	872.34	1,177.23
Rate 70	MV -STD	7,990.99	4.31				2,513.67			
Rate 70	MV -TOU	7,990.99		4.63	4.75	5.31		312.50	870.58	1,333.86
Rate 60	S	3,222.17	12.39							
Rate 60	T	3,222.17	11.95							

JPS computes rebased tariffs with an FX adjustment factor in keeping with computations used for billing purposes.

The Adjustment Factor is calculated as shown in the equation below:

$$\boldsymbol{FX_{adj}} = \left(\frac{Base\ FX_y - Base\ FX_{y-1}}{Base\ FX_y}\right) * USD_{SCost}$$

where:

***FX**$_{adj}$ denotes the computed foreign exchange adjustment factor*
***Base FX** $_{y-1}$ is the base foreign exchange rate in the prior regulatory period (2021)*
***Base FX**$_y$ is JPS' proposed Base foreign exchange rate for the current regulatory period (2022)*
USD$_{SCost}$ *is the average percent share of JPS cost denominated in USD*

Applying the formula above yields an FX adjustment factor of 5.52% which is applied to the revenue target for each component in *Table 7-2* above, by rate class.

$$\boldsymbol{FX_{adj}} = \left(\frac{155-145}{145}\right) * 80\%$$

The table below shows the 2021 revenue basket, adjusted for movement in foreign exchange rate, rebased at J$155: US$1

Table 7-5: 2021 revenue basket adjusted for movement in FX rate

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	4,156,202,850	4,233,983,908.32								8,390,186,759
Rate 10	LV > 100		12,894,929,097								12,894,929,097
Rate 20	LV	1,003,035,066	5,338,960,831								6,341,995,897
											-
Rate 40	LV - Std	180,828,150	4,189,831,521				6,475,019,685				10,845,679,355
Rate 40	LV - TOU	11,333,382		286,484,265	264,969,437	77,047,274		96,259,028	344,559,639	377,313,825	1,457,966,850
Rate 50	MV - Std	12,750,054	907,190,392				1,409,795,901				2,329,736,347
Rate 50	MV - TOU	2,327,391		86,153,342	87,017,391	31,448,439		56,887,253	158,656,083	163,665,357	586,155,256
Rate 70	MV -STD	2,023,818	928,193,033				2,077,757,851				3,007,974,702
Rate 70	MV -TOU	404,764		102,378,007	90,272,972	30,318,040		36,633,696	109,719,901	147,811,707	517,539,086
Rate 60	LV	7,670,915	638,235,035								645,905,950
		12,934,469	7,337,856								20,272,325
TOTAL		5,389,510,859	29,138,661,673	475,015,613	442,259,800	138,813,753	9,962,573,437	189,779,977	612,935,623	688,790,889	47,038,341,624

7.2.2 2022 Outlook and Demand Forecast

The Planning Institute of Jamaica has estimated a growth in the overall economy within the range of 3% - 6% for the fiscal year 2022/23. This is predicated on the easing of CoVid-19 containment measures locally, as well as the further opening of the economies of Jamaica's main trading partners and overall general positive feedback in business and consumer confidence.

Major downside risks include the continued spread of CoVid-19 virus given the low vaccination rates throughout the population and the ever-increasing number of mutated strains. This could dampen economic recovery should the health indicators become extreme and the Government forced to implement additional control measures.

The Russian-Ukraine war, the associated geopolitical tensions, and the spill over effects into commodity and financial markets will also constrain economic recovery, slowing any progress that has been made over the past year as the world slowly lifted CoVid-19 restrictions. Lingering effects of the logistics and supply chain crisis is also expected to continue, further adding upward pressures on local and global prices. In 2021, the Bank of Jamaica report an inflation rate of 7.3%, which is noted to be higher than expected and outside of the upper end of its target for the year.

For the 2022 Outlook, inflation is expected to remain at elevated levels reflective of the volatility in energy and other commodity markets. The Bank of Jamaica reported an inflation rate of 10.7 percent for the month of February 2022 with an average target of 4-6 percent for the remainder of the year. The Bank continues its monetary policy position of increasing its benchmark interest rate to temper the effects of further price increases.

The bulk of the expenditure within Jamaica's energy sector is denominated in United States Dollars. With US inflation also at record levels with an 8.5 percent recorded in March 2022 as reported by the Bureau of Labor Statistics, these adverse effects will also ripple through to customers via fuel and related costs.

Globally fuel prices have risen sharply with oil prices surpassing the US$100 per barrel for the West Texas Intermediate (WTI) benchmark brought on by the effects of economic sanctions, a decline in output from Russia, and the ongoing uncertainties about potential supply and market disruptions because of the ongoing conflict. Liquefied natural gas has also been affected with the US Energy Information Administration (EIA) projecting gas prices to close the year at an average of US$5.23/MMBtu (Henry Hub). This compares to the US$3.76/MMBtu at the close of 2021.

Given these uncertainties and risks that exist within the global and local economy, JPS in accordance with the forward looking revenue cap mechanism reviewed the forecast for 2022 as approved by the OUR in the 2019 Final Determination. This is in keeping with section 17.58 of the 2019 Determination and the spirit of the methodology adopted in the 2021 Determination Notice.

7.2.3 2022 Billing Determinant Forecast

The forecast for electricity demand is a key factor in the determination of non-fuel tariffs especially as it relates to the forward-looking Revenue Cap Mechanism and the targets established in the 2019 Final Determination Notice.

As CoVid-19 restrictions are lifted locally as well as in key countries with close economic ties with Jamaica, recovery is expected to continue but will be tempered by the new global uncertainties outlined above. As such, electricity demand is projected to remain below historical levels. In the following sections JPS presents its review of the electricity forecast and targets established within the 2019 Determination Notice as part of the forward looking PBRM, giving due consideration to the 2021 performance and the economic outlook for the 2022 regulatory period.

7.2.4 Energy Sales

Table 7-6 below shows the 2022 forecast scenarios. The original forecast as per the 2019 Determination Notice of 3,237GWh was adjusted for known unregulated inclusions. The revised value is shown in the fourth column as 3,147 GWh and represent a growth of approximately 5.7% relative to 2021 actual performance.

The 2021 Annual Determination Notice in reviewing demand forecast, outlined a rule based mechanism that arose out of discussions between JPS and the OUR. The Determination states:

3. *"JPS's Energy forecast would be accepted if the variance between that and the OUR's forecast for overall sales for the respective category is less than ±3%"*
4. *"The mean of the two Energy forecasts would be employed if JPS's forecasts deviate from that of the OUR's overall Energy forecast in each respective category by an amount greater than ±3%"*

JPS conducted analysis in keeping with the practice and the methodology used in the last annual review. Following the rules stated above, total energy sales is estimated to close the year at approximately 3,100 GWh, an increase of around 4.2%. With the slow economic recovery, rise in oil prices and the resultant downward pressure on electricity sales due to conservation and other factors, JPS does not expect this level of electricity demand in 2022 especially against the outcome for 2021 where energy sales remained below 3,000 GWh, a level last seen during the economic downturn between 2011- 2012. Electricity sales performance since the start of the year has also been weaker than originally expected.

Electricity is now 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 3,067 GWh, an increase of 3 percent relative to 2021. With the exceptions of residential customers and street lighting, consumption is likely to increase for all other categories.

3,067 GWh is JPS' proposed target for energy sales for the 2022/23 regulatory period. *Table 7-6* below shows the breakout by rate class.

Table 7-6: JPS Energy Forecast Scenarios - 2022

	2020 Actual	JPS 2021 Acutual		2022 Forecast			Growth Rate wrt 2021 Actuals		
			OUR Det	OUR Det *(adj CCC ltd)*	JPS LE	Avg JPS/OUR 3% Rule Based			
		(GWh)		(GWh)	(GWh)	(GWh)	OUR Det	JPS LE	3% Rule Based
Rate 10	1,139	1,123	1,123	1,123	1,090	1,098	-0.01%	-2.91%	-2.26%
Rate 20	554	546	641	641	591	618	17.4%	8.3%	13.1%
Rate 40	740	741	830	830	792	814	12.1%	6.9%	10.0%
Rate 50	228	236	329	239	255	248	1.1%	8.0%	4.7%
Rate 60	52	49	40	40	45	41	-18.2%	-9.7%	-16.4%
Rate 70	226	282	274	274	294	283	-2.8%	4.2%	0.3%
Toatal	**2,939**	**2,977**	**3,237**	**3,147**	**3,067**	**3,101**	**5.71%**	**3.02%**	**4.16%**

7.2.5 Demand kVA

KVA demand is expected to remain flat relative to prior year, with any potential upside resulting in a less than 2 percent growth.

Table 7-7 below illustrates the forecast scenarios for the year relative to actual performance and prior target. kVA demand is less volatile than energy consumption once production and commercial activities are ongoing within the economy, as such aggregate projections are relatively similar across the different scenarios. However, the main variances are observed at the rate class and sub-category levels. For example, where the JPS outlook for RT40 is for marginal growth, the Determination and the "rule-based" scenarios anticipates a 6.6% and 3.8% growth respectively. JPS also expect a strong growth of 4.5% for RT70, in contrast to the weakened outlook from the Determination original forecast.

Similar to the energy forecast, the 2021 Annual Determination Notice outlined a 3 percent margin rule between the projections put forward by the JPS and the OUR. The Determination stated as follows.

1. *"JPS's Demand forecast would be accepted if the variance between that and the OUR's forecast for overall sales for the respective category is less than ±3%"*
2. *"The mean of the two Demand forecasts would be employed if JPS's forecasts deviate from that of the OUR's overall Energy forecast in each respective category by an amount greater than ±3%"*

For consistency, these values are shown as *"OUR Rule Based."* The JPS forecast and the original target from the 2019 Determination are also shown and analysed.

JPS projects an overall 1.6 percent growth relative to the 1.7 percent under the OUR scenarios. Notably, JPS anticipates a continued recovery of kVA demand from RT70 customers at 4.5 percent in contrast to the OUR's targets. RT50 is expected to remain roughly flat, with RT40 showing a marginal increase of 1.1 percent.

Table 7-7: 2022 kVA Demand Forecast Scenarios

		2021		2022 - Forecast Scenarios				2022 Variance vs 2021 Actuals	
Rate Class	Unit	OUR Det	JPS Actuals	OUR Det	OUR Rules Based	JPS Budget	OUR Det	OUR Rules Based	JPS Budget
RT40	kVA	**3,044,652**	**3,059,939**	**3,262,160**	**3,177,528**	**3,092,896**	**6.61%**	**3.84%**	**1.08%**
Standard	kVA	**2,241,744**	**2,280,965**	**2,384,648**	2,332,878	2,281,108	4.55%	2.28%	0.01%
TOU	kVA	**802,908**	**778,974**	**877,512**	**844,650**	**811,788**	**12.6%**	8.43%	4.21%
RT50	kVA	**1,181,705**	**1,134,476**	**1,075,248**	**1,109,033**	**1,139,718**	**-5.2%**	**-2.24%**	**0.46%**
Standard	kVA	**704,421**	647,615	614,663	636,003	657,344	-5.1%	-1.79%	1.50%
TOU	kVA	**477,284**	**486,861**	**460,585**	**473,030**	**482,374**	**-5.4%**	-2.84%	-0.92%
RT70	kVA	**1,118,830**	**1,004,938**	**952,110**	**1,001,232**	**1,050,354**	**-5.3%**	**-0.37%**	**4.52%**
Standard	kVA	**783,298**	661,594	591,114	659,209	727,304	-10.7%	-0.36%	9.93%
TOU	kVA	335,532	343,344	360,996	342,023	323,050	5.1%	-0.38%	-5.91%
Totals	**kVA**	**5,345,186**	**5,199,353**	**5,289,518**	**5,287,793**	**5,282,968**	**1.7%**	**1.70%**	**1.61%**

JPS therefore proposes 5,282 MVA as the demand-billing determinant for 2022/23, in keeping with the spread across rate class and sub-categories as per the "*JPS budget* scenario."

7.2.6 2022 Customer Forecast

Table 7-8 illustrates the customer forecast for the 2022/23 regulatory period. The projections for 2022 as per the 2019 Final Determination is 720K customers, driven by high growth from residential customers. However, this contrasts actual and expected outcome. As such, JPS proposes the customer billing determinant at 694,708 in keeping with the spread per rate class in the *"JPS budget scenario."*

Table 7-8: 2022 Customer Forecast

Rate Class	Unit	2021		2022 - Forecast Scenarios		2 Variance vs 2021 Actu	
		OUR Det	JPS Actuals	OUR Det	JPS Budget	OUR Det	JPS Budget
RT10	*No.*	617,023	618,726	649,100	621,150	4.91%	0.39%
RT20	*No.*	69,837	69,251	68,556	70,952	-1.00%	2.46%
RT40	*No.*	1,899	1,890	1,916	1,926	1.38%	1.90%
RT50	*No.*	149	149	152	151	2.01%	1.53%
RT70	*No.*	24	24	24	24	0.00%	0.00%
RT60	*No.*	505	482	531	505	10.17%	4.77%
TOTALS	*No.*	**689,437**	**690,522**	**720,279**	**694,708**	**4.31%**	**0.61%**

7.3 JPS Revenue Basket and Proposed Non-Fuel Tariffs for 2022

For 2022 regulatory period, JPS proposes and Annual Revenue Target (ART) of J$ 51.301 billion dollars at an exchange rate of J$155:US$1. Recovery per rate class and billing component is shown below in Table 7-9.

Table 7-9: JPS Proposed Revenue Basket and Annual Revenue Target for 2022

Class		Block/ Rat	Customer	Energy-J$/kWh				Demand-J$/KVA				Total Revenue
		Option	Charge	Std.	Off-Peak	Part-Peak	On-Peak	Std.	Off-Peak	Part Peak	On-Peak	
Rate 10	LV	--100	4,532,839,750	4,617,669,361	-	-	-	-	-	-	-	9,150,509,111
Rate 10	LV	> 100	-	14,063,473,148	-	-	-	-	-	-	-	14,063,473,148
Rate 20	LV		1,093,930,538	5,822,779,770	-	-	-	-	-	-	-	6,916,710,308
Rate 40	LV - Std		197,214,875	4,569,515,865	-	-	-	7,061,788,769	-	-	-	11,828,519,509
Rate 40	LV - TOU		12,360,417	-	312,445,593	288,981,082	84,029,332	-	104,982,063	375,783,782	411,506,167	1,590,088,436
Rate 50	MV - Std		13,905,470	989,400,377	-	-	-	1,537,552,216	-	-	-	2,540,858,063
Rate 50	MV - TOU		2,538,300	-	93,960,595	94,902,945	34,298,310	-	62,042,401	173,033,565	178,496,783	639,272,898
Rate 70	MV -STD		2,207,217	1,012,306,287	-	-	-	2,266,045,166	-	-	-	3,280,558,670
Rate 70	MV -TOU		441,443	-	111,655,546	98,453,547	33,065,474	-	39,953,457	119,662,766	161,206,467	564,438,701
Rate 60	ST		8,366,057	696,072,169	-	-	-	-	-	-	-	704,438,227
	TL		14,106,596	8,002,816								22,109,412
TOTAL			5,877,910,664	31,779,219,795	518,061,734	482,337,574	151,393,116	10,865,386,150	206,977,921	668,480,114	751,209,417	51,300,976,483

The proposed billing determinants for each rate category is in keeping with the JPS forecast scenarios outlined above.

Table 7-10 show the proposed forecast and billing determinant for the 2022/23 regulatory period. Total energy is projected to be about 3,067 GWh. MVA demand and the number of customers is estimated to end the year at 5282 MVA and 691,727 respectively.

Table 7-10: JPS' Proposed Billing Determinants - 2022

Class		Average 2021 Customer	Energy kWh				Demand-KVA			
			Std.	Off-Peak	Part Peak	On-Peak	Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV < 100	621,150	537,594,801							
Rate 10	LV > 100		552,835,994							
Rate 20	LV	70,952	591,198,451							
Rate 40	LV - STD	1,813	677,695,528				2,281,108	-	-	-
Rate 40	LV - TOU	113		53,536,000	48,317,019	12,575,512		293,472	285,884	232,432
Rate 50	MV -STD	129	218,761,652				657,344	-	-	-
Rate 50	MV -TOU	24		15,986,431	15,043,344	5,698,151		186,821	172,214	123,339
Rate 70	MV -STD	20	250,642,323				727,304			
Rate 70	MV -TOU	4		15,169,547	18,555,367	9,164,218		112,832	112,712	97,505
Rate 60	S	188	44,134,343							
Rate 60	T	317	525,142							
Rate 60		**694,709**	**2,873,388,234**	**84,691,978**	**81,915,731**	**27,437,881**	**3,665,756**	**593,125**	**570,810**	**453,276**

The 2022 tariffs are computed as the quotient of the revenue components of the 2022 ART, and the 2022 Billing Determinants. The table below shows proposed non-fuel tariffs for the 2022/23 regulatory year.

Table 7-11: 2022 Proposed Non-Fuel Tariffs

Class		Block/ Rat Option	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	608.13	8.59				-	-	-	-
Rate 10	LV	> 100		25.44				-	-	-	-
Rate 20	LV		1,284.83	9.85				-	-	-	-
Rate 40	LV - Std		9,063.83	6.74				3,095.77	-	-	-
Rate 40	LV - TOU		9,063.83		5.84	5.98	6.68		357.72	1,314.46	1,770.44
Rate 50	MV - Std		9,063.83	4.52				2,339.04			
Rate 50	MV - TOU		9,063.83		5.88	6.31	6.02		332.10	1,004.76	1,447.20
Rate 70	MV -STD		9,063.83	4.04				3,115.68			
Rate 70	MV -TOU		9,063.83		7.36	5.31	3.61		354.10	1,061.66	1,653.31
Rate 60	ST		3,708.36	15.77				-	-	-	-
	TL		3,708.36	15.24							

The table below reflects the weighting of each revenue component of the 2022 tariff basket.

Table 7-12: Non-fuel revenue basket weighting - 2022

Class		Block/ Rat Option	Customer Charge	Energy-J$/kWh				Demand-J$/KVA				Total
				Std.	Off-Peak	Part-Peak	On-Peak	Std.	Off-Peak	Part Peak	On-Peak	
Rate 10	LV	--100	8.84%	9.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	17.84%
Rate 10	LV	> 100	0.00%	27.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	27.41%
Rate 20	LV		2.13%	11.35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	13.48%
Rate 40	LV - Std		0.38%	8.91%	0.00%	0.00%	0.00%	13.77%	0.00%	0.00%	0.00%	23.06%
Rate 40	LV - TOU		0.02%	0.00%	0.61%	0.56%	0.16%	0.00%	0.20%	0.73%	0.80%	3.10%
Rate 50	MV - Std		0.03%	1.93%	0.00%	0.00%	0.00%	3.00%	0.00%	0.00%	0.00%	4.95%
Rate 50	MV - TOU		0.00%	0.00%	0.18%	0.18%	0.07%	0.00%	0.12%	0.34%	0.35%	1.25%
Rate 70	MV -STD		0.00%	1.97%	0.00%	0.00%	0.00%	4.42%	0.00%	0.00%	0.00%	6.39%
Rate 70	MV -TOU		0.00%	0.00%	0.22%	0.19%	0.06%	0.00%	0.08%	0.23%	0.31%	1.10%
Rate 60	ST		0.02%	1.36%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.37%
	TL		0.03%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%
TOTAL			**11.46%**	**61.95%**	**1.01%**	**0.94%**	**0.30%**	**21.18%**	**0.40%**	**1.30%**	**1.46%**	**100.0%**

7.3.1 Average Tariff Impact

The table below summarizes the likely average tariff impact in keeping with the rate proposal in the above sections.

Table 7-13: Average Tariff and Bill Impact

	2021	2022
ART J$"M	47,036	51,301
Energy Sales - Tariff Setting GWh)	2,996	3,067
Energy Sales - Actual	2,977	
Sales Growth		2.99%
Current Average Tariff		
Non-Fuel	**15.70**	**16.73**
Fuel Rate @March 2022	36.42	36.42
IPP Rate @ March 2022	12.39	12.39
Overall Rate	**64.51**	**65.54**
Rate Impact		
Non-Fuel		**6.55%**
Overall Rate		**1.59%**

2021 reflects the ART adjusted for movement in foreign exchange as outlined in section 7.2.1 above. This results in an average non-fuel rate of J$15.70. For 2022, JPS estimates an average non-fuel tariff of J$16.73 which represent an increase of 6.6%, a movement of J$1.03 cents relative to 2021.

Overall, this would translates into an average bill impact of only 1.6%, inclusive of fuel and IPP charges.

7.3.2 Bill Impact Assessment by Rate Class

The following tables present the estimated bill impact for customers across the various rate class using the average monthly consumption for each rate class.

A residential customer with an average consumption of 160 kWh per month will see an increase of approximately 3.3% or a marginal increase of J$351.57 over their current bill.

Table 7-14: Bill Impact for a Rate 10 customer at 160 kWh

Current Bill

Description	Usage	Rate	Charges ($)
Non-Fuel Charges			
Energy 1st	100	7.32	732.00
Energy Next	60	21.03	1,261.80
Customer Charge		531.93	531.93
Electricity Efficiency Improvement Fund		-	-
Sub Total			2,525.73
F/E Adjustment			139.35
Total Non-Fuel Charges			2,665.08
Base/Exchange Rate	145	155.0000	
Fuel & IPP Charges	160	36.420	5,827.20
IPP Variable Charges	160	12.870	2,059.20
Tariff Adjustment	160	(0.113)	(18.08)
Taxable Charges			713.67
GCT @ 15.0%			107.05
Bill Total			**10,640.45**

Estimated New Bill

Description	Usage	Rate	Charges ($)
Non-Fuel Charges			
Energy 1st	100	8.59	859.00
Energy Next	60	25.44	1,526.40
Customer Charge		608.13	608.13
Electricity Efficiency Improvement Fund		-	-
Sub Total			2,993.53
F/E Adjustment			-
Total Non-Fuel Charges			2,993.53
Base/Exchange Rate	155	155.0000	
Fuel Charges	160	36.420	5,827.20
IPP Charges	160	12.870	2,059.20
Tariff Adjustment	160		-
Taxable Charges			747.30
GCT @ 15.0%			112.10
Bill Total			**10,992.03**

SUMMARY

Estimated New Bill		10,992.03
Current Bill		10,640.45
Net Change	Amount	351.57
	Percentage	3.30%

A Rate 20 customer with an average consumption of 750 kWh per month will likely see an increase of 0.9% or approximately J$476.27 more compared to their current bill.

Table 7-15: Bill Impact for a Rate 20 customer at 750 kWh

Current Bill

Description	Usage	Rate	Charges ($)
Non-Fuel Charges			
Energy	750	9.03	6,772.50
Customer Charge		1,134.20	1,134.20
Sub Total			7,906.70
F/E Adjustment			436.23
Total Non-Fuel Charges			8,342.93
Base/Exchange Rate	145.00	155.00	
Fuel Charges	750	36.420	27,315.00
IPP Variable Charges	750	12.870	9,652.50
Tariff Adjustment	750	(0.113)	(84.75)
Taxable Charges			45,225.68
GCT @ 15.0%			6,783.85
Bill Total			**52,009.53**

Estimated New Bill

Description	Usage	Rate	Charges ($)
Non-Fuel Charges			
Energy 1st	750	9.85	7,387.50
Customer Charge		1,284.83	1,284.83
Sub Total			8,672.33
F/E Adjustment			-
Total Non-Fuel Charges			8,672.33
Base/Exchange Rate	155.00	155.00	
Fuel Charges	750	36.420	27,315.00
IPP Charges	750	12.870	9,652.50
Tariff Adjustment			-
Taxable Charges			45,639.83
GCT @ 15.0%			6,845.97
Bill Total			**52,485.80**

SUMMARY

Estimated New Bill		52,485.80
Current Bill		52,009.53
Net Change	Amount	476.27
	Percentage	0.92%

The Standard Rate 40 customer with an average consumption of 35,000 kWh for the month and a kVA demand of 100 is estimated to see an increase of approximately 1.9% over the current bill.

Table 7-16: Bill Impact for a Rate 40 Customer at 35,000 kWh and 100 kVA

Current Bill				Estimated New Bill			
MT40 STD	**Usage**	**Rate**	**Charges**	**MT40 STD**	**Usage**	**Rate**	**Charges**
kWh Std	35,000.0	6.09	213,150.00	kWh Std	35,000.0	6.74	235,900.00
kVA Std	100.0	2,737.13	273,713.00	kVA Std	100.0	3,095.77	309,577.00
Customer Charge		7,990.99	7,990.99	Customer Charge		9,063.8	9,063.83
Subtotal			**494,853.99**	**Subtotal**			**554,540.83**
F/E Adjust	145.00	155.00	27,302.29	F/E Adjust	155.00	155.00	-
Fuel Charge	35,000.0	34.96	1,223,740.00	Fuel Charge	35,000.0	34.96	1,223,740.00
IPP Fixed Charge	100.0	664.67	66,467.00	IPP Fixed Charge	100.0	664.67	66,467.00
IPP Variable Charge	35,000.0	2.12	74,200.00	IPP Variable Charge	35,000.0	2.12	74,200.00
Tariff Adjustment	35,000.0	(0.113)	(3,955.00)	Tariff Adjustment			-
Taxable Charges			1,882,608.28	Taxable Charges			1,918,947.83
GCT Charge		15.0%	282,391.24	GCT Charge		15.0%	287,842.17
Total Bill			**2,164,999.52**	**Total Bill**			**2,206,790.00**
					Bill Impact ->>		1.93%

SUMMARY

Estimated New Bill		2,206,790.00
Current Bill		2,164,999.52
Net Change	Amount	41,790.48
	Percentage	1.93%

The Standard Rate 50 customer with an average consumption of 500,000 kWh for the month and a kVA demand of 1,500 is estimated to see an increase of approximately 2.1% over their current bill.

Table 7-17: Bill Impact for a Rate 50 Customer at 500,000 kWh and 1500 kVA

Current Bill				Estimated New Bill			
MT50 STD	**Usage**	**Rate**	**Charges**	**MT50 STD**	**Usage**	**Rate**	**Charges**
kWh Std	500,000.0	4.32	2,160,000.00	kWh Std	500,000.0	4.52	2,260,000.00
kVA Std	1,500.0	1,896.55	2,844,825.00	kVA Std	1,500.0	2,339.04	3,508,560.00
Customer Charge		7,990.99	7,990.99	Customer Charge		9,063.8	9,063.83
Subtotal			**5,012,815.99**	**Subtotal**			**5,777,623.83**
F/E Adjust	145.0	155.00	276,569.16	F/E Adjust	155.00	155.00	-
Fuel Charge	500,000.0	34.96	17,482,000.00	Fuel Charge	500,000.0	34.96	17,482,000.00
IPP Fixed Charge	1,500.0	1,745.29	2,617,935.00	IPP Fixed Charge	1,500.0	1,745.29	2,617,935.00
IPP Variable Charge	500,000.0	0.42	210,000.00	IPP Variable Charge	500,000.0	0.42	210,000.00
Tariff Adjustment	500,000.0	(0.113)	(56,500.00)	Tariff Adjustment			
Taxable Charges			25,542,820.15	Taxable Charges			26,087,558.83
GCT Charge		15.0%	3,831,423.02	GCT Charge		15.0%	3,913,133.82
Total Bill			**29,374,243.17**	**Total Bill**			**30,000,692.65**
					Bill Impact ->>		2.13%

SUMMARY

Estimated New Bill		30,000,692.65
Current Bill		29,374,243.17
Net Change	Amount	626,449.48
	Percentage	2.13%

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 an increase of approximately 1.6% over the current bill.

Table 7-18: Bill Impact for a Rate 70 Customer at 1,000,000 kWh and 2500 kVA

Current Bill					Estimated New Bill			
MT70 STD	**Usage**	**Rate**	**Charges**		**MT70 STD**	**Usage**	**Rate**	**Charges**
kWh Std	1,000,000	4.31	4,310,000.00		kWh Std	1,000,000	4.04	4,040,000.00
kVA Std	2,500	2,513.67	6,284,175.00		kVA Std	2,500	3,115.68	7,789,200.00
Customer Charge		7,990.99	7,990.99		Customer Charge		9,063.8	9,063.83
Subtotal			**10,602,165.99**		**Subtotal**			**11,838,263.83**
F/E Adjust	145.00	155.00	584,947.09		F/E Adjust	155.00	155.00	-
Fuel Charge	1,000,000.0	34.96	34,964,000.00		Fuel Charge	1,000,000.0	34.96	34,964,000.00
IPP Fixed Charge	2,500.0	424.14	1,060,350.00		IPP Fixed Charge	2,500.0	424.14	1,060,350.00
IPP Variable Charge	1,000,000.0	0.42	420,000.00		IPP Variable Charge	1,000,000.0	0.42	420,000.00
Tariff Adjustment	1,000,000.0	(0.113)	(113,000.00)		Tariff Adjustment			
Taxable Charges			47,518,463.08		Taxable Charges			48,282,613.83
GCT Charge		15.0%	7,127,769.46		GCT Charge		15.0%	7,242,392.07
Total Bill			**54,646,232.54**		**Total Bill**			**55,525,005.90**
						Bill Impact ->>		1.61%

SUMMARY

Estimated New Bill		55,525,005.90
Current Bill		54,646,232.54
Net Change	Amount	878,773.36
	Percentage	1.61%

7.4 Prepaid Tariff

JPS proposes the continuation of its prepaid electricity service and maintains the existing two-tier tariff structure for both residential and small commercial customers. The design of the pre-paid tariff is based on the proposed post-paid rates in Table 7-11 above.

7.4.1 RT10 – Residential Prepaid Rates

The prepaid tariff for residential customers maintains the lifeline benefit from the regular tariff structure for an amount equivalent to the first 100 KWh. This results in a net revenue leakage position for JPS as the average tariff will not be equivalent to the post-paid at low consumption levels due to the absence or under-recovery for a fixed customer charge and the continuation of the discounted lifeline tariff. These factors create a distortion in arriving an equivalent prepaid tariff that yields no variance in revenues relative to the post-paid tariff for residential customers.

While this has been the practice during this phase, where the prepaid service is limited in its reach, in principle this variance is incorrect and can become unsustainable should the prepaid programme become expanded and mainstream, as is the current contemplation by JPS as part of its strategic objectives.

To address this issue and to minimize the potential risk for loss of revenues, JPS conducted a two-step analysis. Firstly, the revenue variance was calculated using a minimizing function in keeping with the existing prepaid tariff methodology, adherence to the pure lifeline benefit, and updated to reflect the proposed residential tariffs in Table 7-11 above.

At the proposed tariffs, this would yield a net revenue loss of J$72.3 million/month or J$867.7 million per year. This would be equivalent to US$466.5K and US$5.6 million respectively. This is shown in *Table 7-19* below with the resultant prepaid tariff as follows:

- $ 17.10/kWh for the first 129 kWh in a 30 day cycle; and
- $ 25.44/kWh for every kWh above 129 kWh in a 30 day cycle.

Table 7-19: Prepaid Variance Analysis without lifeline Adjustment

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	142,292	22,350	13	55.37	17.10	102,423,204.52	31,631,511.60	(70,791,692.92)	(849,500,315.04)
50-100 kWh	120,639	100,857	70	17.28	17.10	145,924,934.40	144,404,883.00	(1,520,051.40)	(18,240,616.80)
100-200 kWh	214,057	358,839	140	17.75	17.75	531,931,645.00	531,931,645.00	-	-
200-300 kWh	83,519	244,842	244	21.03	21.03	428,562,715.08	428,562,715.08	-	-
300-400 kWh	29,696	125,341	352	22.38	22.38	233,937,960.96	233,937,960.96	-	-
400-500 kWh	11,755	66,489	471	23.15	23.15	128,172,405.75	128,172,405.75	-	-
500- 1000 kWh	14,848	111,639	627	23.72	23.72	220,825,989.12	220,825,989.12	-	-
>1000 kWh	3,093	92,658	2,496	25.01	25.01	193,080,401.28	193,080,401.28	-	-
Total						**1,882,436,052**	**1,880,916,000**	**(72,311,744)**	**(867,740,932)**

To reduce this potential leakage, an incremental dollar amount is added to the first block, which is derived as the average J$/kWh variance between the upper limit for the prepaid first block and the average consumption for each kWh bucket as listed in the table. This amount was calculated as J$1.283/kWh and significantly reduces the potential any loss of revenues as shown in *Table 7-20* below. As can be seen the variance between the post-paid revenues across all blocks will no longer be equal to nil, but instead the loss at the lower bands is compensated by some recovery at higher consumption levels. This approach minimizes the potential for loss of revenues while maintaining the lifeline benefit.

Table 7-20: Prepaid Variance Analysis with incremental lifeline adjustment

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	142,292	22,350	13	55.37	18.38	102,423,204.52	33,999,250.48	(68,423,954.04)	(821,087,448.48)
50-100 kWh	120,639	100,857	70	17.28	18.38	145,924,934.40	155,214,137.40	9,289,203.00	111,470,436.00
100-200 kWh	214,057	358,839	140	17.75	18.93	531,931,645.00	567,293,861.40	35,362,216.40	424,346,596.80
200-300 kWh	83,519	244,842	244	21.03	21.71	428,562,715.08	442,420,187.56	13,857,472.48	166,289,669.76
300-400 kWh	29,696	125,341	352	22.38	22.85	233,937,960.96	238,850,867.20	4,912,906.24	58,954,874.88
400-500 kWh	11,755	66,489	471	23.15	23.51	128,172,405.75	130,165,583.55	1,993,177.80	23,918,133.60
500- 1000 kWh	14,848	111,639	627	23.72	23.99	220,825,989.12	223,339,607.04	2,513,617.92	30,163,415.04
>1000 kWh	3,093	92,658	2,496	25.01	25.08	193,080,401.28	193,620,810.24	540,408.96	6,484,907.52
Total						**1,882,436,052**	**1,950,905,054**	**45,049**	**540,585**

The above analysis translate into prepaid residential tariffs as follows:

- $ 18.38/kWh for the first 129 kWh in a 30 day cycle; and

- $ 25.44/kWh for every kWh above 129 kWh in a 30 day cycle. The second block remains in line with the standard tariff for the post-paid tariff.

7.4.2 RT20- Small Commercial Prepaid Rates

The prepaid design for Rate 20 customers is dependent is directly related to the proposed post-paid rates and avoids the distortion and added complexity of the residential tariff. Assuming the acceptance of JPS's tariff proposal in Table 7-11 above, the prepaid Rate 20 tariff is described as follows:

- $ 138.33/kWh for the first 10kWh in a 30 day cycle; and
- $ 9.85/kWh for every kWh above 10kWh in a 30 day cycle.

The analysis for this proposal is shown in the table below. This tariff structure retains revenue neutrality for JPS for Rate 20 customers.

Table 7-21: Analysis of Proposed Prepaid for RT20 Customers

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	20,304	3,463	14.21	100.27	100.27	28,929,884.36	28,929,884.36	-	-
(50-100] kWh	8,324	8,186	81.95	25.53	25.53	17,415,335.45	17,415,335.45	-	-
(100-1000] kWh	30,962	142,438	383.37	13.20	13.20	156,682,705.61	156,682,705.61	-	-
(1000-7500] kWh	8,656	268,778	2,587.59	10.35	10.35	231,821,153.06	231,821,153.06	-	-
>7500 kWh	1,004	207,022	17,183.10	9.92	9.92	171,138,177.41	171,138,177.41	-	-
						577,057,371.53	**577,057,371.53**	**-**	**-**

8. Other Regulatory Matters

8.1 International Financial Reporting Standard for Lease (IFRS 16)

The International Accounting Standards Board published the IFRS 16 - International Financial Reporting Standards referred to the treatment of Leases - in January 2016 with an effective date of 1 January 2019. The new standard requires lessees to recognise nearly all leases on the balance sheet including assets of Independent Power Producers (IPPs). The implementation of IFRS 16 has had a negative economic and financial impact on JPS. In this section the regulatory treatment of this impact is discussed.

In principle, the general implementation of IFRS rules is an obligation under the Licence. Condition 5 of the Licence establishes the accounting principles to be followed by JPS:

Condition 5: Accounts for the Licensed Business

1. *The financial year of the Licensee shall run from January 1 to December 31 or fiscal year as agreed with the Office.*

2. *The Licensee shall maintain such Regulatory Accounts as may reasonably be specified by the Office consistent with generally accepted accounting principles and the EA.*

3. *The Licensee shall in respect of the Licensed Business:*
   (a) keep or cause to be kept for the period referred to in Section 145 of the Companies Act and in the manner referred to in that Section such accounting records in respect of the Licensed Business as would by sections 144 and 146 of the Companies Act be required to be kept;
   (b) prepare on a consistent basis from such accounting records, accounting statements which conform to generally accepted accounting practices, state the accounting policies adopted and are in such form and in such detail as the Office may from time to time reasonably require;
   (c) procure in respect of accounting statements prepared in accordance with this Condition, a report by the Licensee's auditors for the time being and addressed to the Office, stating whether in their opinion those statements have been properly prepared in accordance with this Condition and give a true and fair view of revenues, costs, Assets, liabilities, reserves and provisions of, or reasonably attributable to, the Licensed Business; and
   (d) deliver to the Office a copy of the accounting statements required to be prepared by this Condition together with the Auditor's report referred to in sub-paragraph (c) above as soon as reasonably practical and in any event (3) months after the end of the period to which they relate.

4. The Licensee shall in respect of its financial affairs:

(*a) keep and prepare such accounts and accounting statements for, and as at the end of each financial year, as would be required by Sections 144 and 146 of the Companies Act to be kept by the Licensee if the Licensee were a Licensee which was not a Subsidiary of any other company and which did not have any subsidiaries or Affiliate(s); and*

(b) procure in relation to such accounting statements a report of the auditors addressed to the Office, and deliver a copy of such accounting statements to the Office, in accordance with, mutatis mutandis, the requirements of sub-paragraph (c) and (d) of paragraph 3.

5. *The Licensee shall make the accounting statements referred to in paragraphs 3 and 4 available to the public within 28 days of the date upon which it is required to deliver the same to the Office and shall, subject to payment of a reasonable charge, send a copy of such accounting statements to any person who requests them.*

There is also a mention of IFRS dealing with depreciation of capitalized maintenance activities rules in the last paragraph of Schedule 4 of the Licence, which is outlined below as:

The depreciation rates to be applied to the sub-components of the major plant categories delineated above will be determined with reference to the manufacturer's recommended useful life subject to the approval of the OUR. Additionally, major plant maintenance activities prescribed by equipment manufacturers will be depreciated over the period between each recommended maintenance activity in accordance with IFRS. Changes to depreciation rates should be applied prospectively to the net book value of affected assets at the date such changes are brought into effect.

JPS considers the inclusion of IPPs in its asset base an IFRS 16 rule change that would be eligible for a Z-Factor claim in keeping with provisions set out in paragraph 46(d)(i) of Schedule 3 of the Licence which allows for a Z-factor percentage increase in the revenue cap, among others, due to:

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.

Conditions 1 and 3 above relate to this being a special circumstance and not a managerial decision. Conditions 2 and 4 relate to the economic impact on JPS. Each of these conditions are analysed in two groups in the following subsections.

8.1.1 IFRS 16 Adoption as a Special Circumstance

The first condition relates to IFRS 16 being a change in relation to previous IFRS requirements.

Impact on transition

On adoption of IFRS 16 on 1 January 2019, the Company and the Group recognised additional right-of-use assets of $147,079,000 and additional lease liabilities of $147,079,000.

IFRS 16 was issued in 2016 and to be adopted by 2019, as explained by the IFRS in its webpage:[4]

> *In **January 2016,** the International Accounting Standards Board issued a new IFRS® Standard to improve the financial reporting of leases. IFRS 16 Leases replaces IAS 17 Leases and its related Interpretations. **IFRS 16 has an effective date of 1 January 2019**, but earlier adoption is permitted.*

From the above, it is clear that IFRS 16 represents a change in relation to the previous accounting standards and as such falls under the special circumstances contemplated in the Licence for inclusion in the Z-Factor.

The third condition – this not being a managerial decision– is met is also clear from the analysis presented so far. JPS has an obligation to follow IFRS rules which emanates from its Licence and IFRS made it mandatory for all companies to adopt IFRS 16 starting in 2019. JPS adoption of IFRS 16 in January 2019 is therefore a fulfilment of its obligations under the Licence and not a managerial decision.

8.1.2 Costs Associated to Adoption of IFRS 16

Conditions 2 and 4 require that the adoption of IFRS 16 affects JPS's costs or their recovery and that these are more than JMD$50 million. Following the Final Determination, the cost of leases has been recovered based on cash payments reflecting the O&M treatment prior to IFRS 16.

Since the implementation of accounting changes imposed by IFRS 16 the economic cost of leases is reflected in JPS accounts as a liability which pays interest and the corresponding asset is depreciated over the life of the contract. Following IFRS16 these values are equivalent in net present value to the periodic payment under the lease contract.

Nevertheless, the implementation of IFRS 16 results in a mismatch between the amounts recovered through the IPP charges and the associated costs reflected in JPS accounting system which has had a negative impact on JPS business. Table 8-1 shows the impact on JPS Income Statement in 2021 for JPS' different type of lease costs following IFRS 16 and the costs recognized as O&M costs by OUR.

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[4] **https://www.ifrs.org/projects/completed-projects/2016/ifrs-16-leases/#:~:text=IFRS%2016%20has%20an%20effective,but%20earlier%20adoption%20is%20permitted**

Table 8-1: Impact on Income Statement in 2021[5]

Description	IPP leases		Distribution associated leases (Jameco, Head Office, Budget Cars, Printers & Other Leased Property)	
	USD (000)	*JMD (000)*	USD (000)	*JMD (000)*
Costs of leases under previous accounting rule				
IPP Lease Payments	(63,713)	*(9,875,552)*	-	-
Operating Expenses	-	-	(2,961)	(458,921)
Costs under IFRS 16:				
Asset Depreciations	37,320	*5,784,627*	2,497	*387,100*
Interest Expenses	40,517	*6,280,166*	471	*73,042*
Total Variance	**14,124**	***2,189,241***	**8**	***1,221***

The negative impact on JPS involves both, leases associated to IPP charges and leases under O&M distribution costs. The 2019-2024 tariff determination included among the approved O&M costs leases which were projected assuming they would be treated as O&M. This changed with IFRS16. The aforementioned table shows that for 2021 only, with implementation of IFRS 16, JPS only recovers –as recognised costs under the 2019-2024 tariff determination– J$10,134M (J$684M corresponding to IPP costs and J$450M corresponding to non-IPP costs) while the total costs associated to the leases was J$12,283M (J$11,831M corresponding to IPP costs and J$451M corresponding to non-IPP costs) creating a gap of J$2,148M. Of these, J$2,147M are associated with PPA leases while the remaining $1M is related to distribution O&M costs' leases.

Accordingly, there is a mismatch between the economic costs of the leases and the values currently recognized as O&M costs. This has a negative impact on JPS finances which is substantially higher than the threshold established by the Licence –$ 50 million– and therefore qualifies for a Z factor adjustment.

It is important to point out that IFRS 16's treatment of Leases is fully consistent with JPS's tariff methodology. The Licence establishes a tariff determination mechanism based on economic costs of the service as reflected in JPS financial statements. Articles 27 to 33 of the Revenue Requirement Section of the Licence establish the revenue requirement to be estimated as RR = O&M + D + wacc*K + T.

The implementation of IFRS 16 therefore, implies a reduction in O&M costs and an equivalent (in net present values) increase in D and rK (interest payments).

[5] JMD figures obtained by applying JMD/USD 152 FX rate.

8.1.3 Treatment of Future Charges

Given that the implementation of IFRS 16 implies a change in the time profile of costs, to ensure an efficient recovery of all costs – avoiding over or under recovery – requires that future IPP charges and O&M leases are based on the economic costs reflected in JPS books.

Consequently, JPS is requesting that OUR sets out the treatment of IFRS16 given the change in the rule and in the time profile of costs, and the need for JPS to ensure an efficient recovery of said costs.

9. Appendices

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Appendix B: US CPI

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Appendix F: **Capex**

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Losses Orders – 2020-2021
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2021 Bogue GT7 Gas Generator and Free Turbine Overhaul Report
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