Office of Utilities Regulation

Determination Notice

Jamaica Public Service Company Limited Annual Review 2017 & Extraordinary Rate Review - CPLTD

2017 August 31

OFFICE OF UTILITIES REGULATION

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DOCUMENT TITLE AND APPROVAL PAGE

1. DOCUMENT NUMBER: 2017/ELE/006/DET.003

2. DOCUMENT TITLE: Jamaica Public Service Company Limited Annual Review 2017 & Extraordinary Rate Review – CPLTD: Determination Notice

3. PURPOSE OF DOCUMENT:

This document sets out the Office's decisions on (i) issues related to the third annual price adjustment for the Jamaica Public Service Company Limited's Tariff Review Period 2014 – 2019, the second such under the Revenue Cap regime established pursuant to the Electricity Licence, 2016 (the 'Licence') and (ii) the company's request for an extraordinary rate review arising from provisions in the Licence impacting the treatment of its current portion of long term debt.

4. ANTECEDENT DOCUMENTS:

2014/ELE/008/DET.004	Jamaica Public Service Company Limited Tariff Review for Period 2014 - 2019: Determination Notice	2015 January 07
2015/ELE/003/ADM.001	Jamaica Public Service Company Limited Tariff Review for Period 2014 - 2019: Determination Notice – Addendum 1	2015 February 27
Ele 2016/ELE/004DET.001	Jamaica Public Service Company Limited Annual Tariff Adjustment 2016 - Determination Notice	2016 July 04
2017/ELE/001/DET.001	Jamaica Public Service Company Limited Extraordinary Rate Review 2017 Determination Notice	2017 February 01

APPROVAL:

This document is approved by the Office of Utilities Regulation and this Determination becomes effective as of 2017 September 01

On behalf of the Office:

Ansord E. Hewitt
Director General

2017 August 31

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2017 Extraordinary Rate Review Determination	-	Jamaica Public Service Company Limited Extraordinary Rate Review 2017 Determination Notice, Document No. 2017/ELE/001/DET.001
ABNF	-	Adjusted Base-rate Non-Fuel
Addendum 1	-	Jamaica Public Service Company Limited Tariff Review for the Period 2014 – 2019: Determination Notice – Addendum 1, Document No. 2015/ELE/003/ADM.001
Annual Review Submission 2017	-	Jamaica Public Service Company Limited Annual Tariff Adjustment Submission for 2017 & Extraordinary Rate Review dated 2017 May 05
CAIDI	-	Customer Average Interruption Duration Index
CIS	-	Customer Information System
CPLTD	-	Current Portion of Long Term Debt
CPI	-	Consumer Price Index
CT	-	Current Transformer
dCPI	-	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
EEIF	-	Electricity Efficiency Improvement Fund
EGS	-	Electricity Guaranteed Standard
ELS	-	Energy Loss Spectrum
EOS	-	Electricity Overall Standard
FCAM	-	Fuel Cost Adjustment Mechanism
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
IPP	-	Independent Power Producer
JEP	-	Jamaica Energy Partners Limited
JNTL	-	Non-technical losses that are within JPS' control
JPS/Licensee	-	Jamaica Public Service Company Limited
KVA	-	Kilo Volt Amperes
KWh	-	Kilowatt-hours
The Licence	-	The Electricity Licence, 2016
MAIFI	-	Momentary Average Interruption Frequency Index
MED	-	Major Event Day/s

MSET	-	Ministry of Science Energy and Technology
MVA	-	Mega Volt Amperes
MW	-	Megawatt
MWh	-	Megawatt-hours
NBV	-	Net Book Value
NTL	-	Non-technical losses
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
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
PPA	-	Power Purchase Agreement
RE	-	Renewable Energy
SAIDI	-	System Average Interruption Duration Index
SAIFI	-	System Average Interruption Frequency Index
SBF	-	System Benefit Fund
T&D	-	Transmission & Distribution

TFP	-	Total Factor Productivity
TL	-	Technical losses
TOU	-	Time of Use
WKPP	-	West Kingston Power Plant
WT	-	Wholesale Tariff

Introduction

The Office of Utilities Regulation ("Office/OUR") in its Jamaica Public Service Company Limited Tariff Review for Period 2014-2019 Determination Notice, Document No. 2014/ELE/008/DET.004 ("2014-2019 Determination Notice") and the Jamaica Public Service Company Limited Tariff Review for the Period 2014 – 2019: Determination Notice – Addendum 1, Document No. 2015/ELE/003/ADM.001 ("Addendum 1"), which came into effect on 2015 January 07 and 2015 March 01 respectively, established the average base non-fuel rate for the Jamaica Public Service Company Limited ("JPS") at J$14.42/kWh under the price cap regime prescribed in the Amended and Restated All-Island Electric Licence, 2011 ("Old Licence"). This base rate was adjusted in 2015 pursuant to the annual review exercise. In 2016, the base revenue of J$41.5 billion, approved in the 2014 – 2019 Determination Notice, was adjusted pursuant to the annual review exercise outlined in the new Electricity Licence, 2016 (the "Licence"), and to date, there have been monthly rate adjustments to account for movements in the monetary exchange rate between the United States dollar and the Jamaican dollar. This is therefore the second annual review that is being sought under the Licence and the third annual review since the issuance of the 2014 – 2019 Determination Notice.

Under the Old Licence, the annual review exercise involved changes in the inflation offset index including efficiency gains and also, potentially provided for the application of penalty/rewards for changes in quality of service to the base year revenue requirement. These provisions have been maintained under the Licence. JPS is also allowed under the Licence to adjust the tariffs for each rate class on such a basis that the resulting percentage change does not result in an increase of the annual rate of change in non-fuel electricity revenues ("dPCI").

The Office is of the view that the adjusted tariffs for this annual adjustment should also accord with the 2014 - 2019 Determination Notice and Addendum 1, whereby until informed by a new cost of service study, JPS is allowed to recover its revenue requirement by 23% fixed charges and 77% variable charges. Given that JPS has been making interim monthly adjustments (as allowed under the Old Licence, and now the Licence) reflecting movements in the foreign exchange rate, the effective change in rate for this annual adjustment for the average customer should reflect the value of the annual adjustment of the base year revenue less the accumulated value of the foreign exchange adjustments over the preceding time period.

In addition to annual reviews, the Licence also makes provision for the conduct of extraordinary rate reviews owing to exceptional circumstances that have a significant impact on the electricity sector and/or JPS. Simultaneously with its Annual Review Submission 2017, JPS has requested an extraordinary rate review in respect of certain new provisions in the Licence which relate to the treatment of its current portion of long term debt. The Office's response to this request is included in this Determination Notice.

Additionally, the Determination Notice also take into consideration and reflects decisions approved by the Office in the Jamaica Public Service Company Limited Extraordinary Rate Review 2017 Determination Notice, Document No. 2017/ELE/001/DET.001 (the "2017 Extraordinary Rate Review Determination").

1. Legislative and Regulatory Framework

The Office/OUR is a multi-sector regulator established pursuant to the Office of Utilities Regulation Act, (the "OUR Act"), to regulate the provision of prescribed utility services in Jamaica. Under Section 4(1)(a) of the OUR Act, the Office has regulatory authority over, inter alia, the generation, transmission, distribution and supply of electricity.

JPS, which has exclusive rights for the transmission, distribution and supply of electricity in Jamaica, is regulated by the Office pursuant to the provisions of the OUR Act, the Electricity Act, 2015 and the Licence, which is published in the Jamaica Gazette Vol. CXXXIX No. 6A[1] dated 2016 January 27.

Section 4(d) of the Electricity Act, 2015 states that "the Office shall regulate the electricity sector generally."

This Determination Notice is being issued pursuant to Sections 4(4), 4(4A), 11 and 12 of the OUR Act and Condition 15, Schedule 3 and Exhibit 1 of the Licence.

Sections 4(4), 4(4A), 11 and 12 of the OUR Act provide, in part, as follows:

> ***4. Functions of the Office***
>
> *"(4) The Office shall have power to determine, in accordance with the provisions of this Act, the rates or fares which may be charged in respect of the provisions of a prescribed utility service.*
>
> *(4A) The rates determined by the Office in respect of prescribed utility services for generation, transmission, distribution and supply of electricity shall –*
>
> *(a) be in accordance with –*
> *(i) the provisions of this Act and any regulations made under this Act;*
> *(ii) the Electricity Act and any regulations made under that Act;*
> *(iii) all policy directions issued by Cabinet with respect thereto; and*
> *(iv) the tariff provisions set out in all licences and enabling instruments with respect thereto;*
>
> *and in determining the appropriate rate of return on investment required to satisfy the interests of persons investing in Jamaica, the opinion of the Bank of Jamaica shall be obtained by way of guidance, which opinion shall take into account relevant market benchmarks and provide an assessment of the appropriate country risk premium; and*
>
> *(b) take into account –*
> *(i) the interest of consumers in respect of matters, including the cost, safety and quality of the services;*
> *(ii) Jamaica's economic development;*
> *(iii) the best use of indigenous resources;*

(iv) the possibility of including specific tariffs to encourage the regularization of and payment for, electricity usage by consumers who are unable to pay for the full cost of the services provided; and

(v) the possibility of including specific tariffs for special economic zones, and wholesale rates for large consumers, to enhance their competitiveness and Jamaica's economic development."

11.Power to fix rates

"11. (1) Subject to subsection (3), the Office may, either of its own motion or upon application made by a licensee or specified organization (whether pursuant to subsection (1) of section 12 or not) or by any person, by order published in the Gazette prescribe the rates or fares to be charged by a licensee or specified organization in respect of its prescribed utility services.

(2) For the purposes of this section, the Office may conduct such negotiations as it considers desirable with a licensee or specified organization, industrial, commercial or consumer interest, representatives of the Government and such other persons or organizations as the Office thinks fit.

(3) The provisions of subsections (1) and (2) shall not apply in any case where an enabling instrument specifies the manner in which rates may be fixed by a licensee or specified organization."

12. Application by approved organization to fix rates.

"12. (1) Subject to subsection (2), an application may be made to the Office by a licensee or specified organization by way of a proposed tariff specifying the rates or fares which the licensee or specified organization proposes should be charged in respect of its prescribed utility services and the date (not being earlier than the expiration of thirty days after the making of the application) on which it is proposed that such rates should come into force (hereinafter referred to as the specified date).

(2)…

(3) Where an application by way of a proposed tariff is made under subsection (1) notice of such application and, if so required by the Office, a copy of such tariff, shall be published in the Gazette and in such other manner as the Office may require.

(4) A notice under subsection (3) shall specify the time (not being less than fourteen days after the publication of the notice in the Gazette) within which objections may be made to the Office in respect of the proposed tariff to which the notice relates.

(5) Subject to the provisions of this Act, the Office may, after the expiration of the time specified in the notice under subsection (3), make an order either -

(a) confirming the proposed tariff without modifications or with such modifications as may be specified in the order; or

(b) rejecting the proposed tariff.

(6) If, after publication of notice of an application in accordance with subsection (3), no order under subsection (5) has been made prior to the specified date, the proposed tariff shall come into force on the specified date.

(7) An order confirming a proposed tariff shall not bring into operation any rates or fares on a date prior to the date of such order."

Condition 2, paragraph 3 of the Licence, provides,

"Subject to the provisions of this Licence the Licensee shall provide an adequate, safe and efficient service based on modern standards, to all parts of the island of Jamaica at reasonable rates so as to meet the demands of the Island and to contribute to economic development."

Condition 15, paragraphs 1 and 2 of the Licence, provide,

"***Condition 15: Price Controls***

(1) The Licensee is subject to the conditions in Schedule 3.
(2) The rates to be charged by the Licensee in respect of the Supply of electricity shall be subject to such limitation as may be imposed from time to time by the Office."

Schedule 3 of the Licence outlines the Revenue Cap Principle as follows:

"*The basis of the rate setting shall be the revenue cap principle which looks forward at five (5) year intervals and involves the decoupling of kilowatt hour sales and the approved revenue requirement…*"

Schedule 3, paragraphs 1– 5 of the Licence entitled "Rates" provide as follows:

1. *"The rates shall be charged to customers in accordance with the 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 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."*

Schedule, 3, paragraphs 42 to 46 of the Licence entitled "Annual Review", provide as follows:

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

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

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

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

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

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

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

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

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

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

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

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

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

d) are not captured be 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 and [determinations] 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."

Schedule 3, paragraphs 49 – 54 of the Licence, inter alia, gives JPS the right to charge late payment interest to GOJ and customers, other than residential customers, who do not pay their bills in full by the due date. With respect to residential customers, the Licence prohibits the charging of interest on overdue balances, but maintains JPS's right to charge a late payment fee and offer an early payment incentive fee, for payments made on time and in full by the due date.

Schedule 3, Exhibit 1 of the Licence entitled "Performance Based Rate-making Mechanism", provides as follows:

"Annual Adjustment of the Annual Revenue Target

The Annual Revenue target shall be adjusted on an annual basis, commencing July 1, 2016, (Adjustment Date), pursuant to the following formulae:

$$\mathrm{ART_y} = \mathrm{RCy}(1 + \mathrm{dPCI}) + \left(\mathrm{RS_{y-1}} + \mathrm{SFX_{y-1}} - \mathrm{SIC_{y-1}}\right) \times (1 + \mathrm{WACC})$$

where:

$$\mathrm{RS_{y-1}} = \mathrm{TUVol}_{y-1} + \mathrm{TULos_{y-1}}$$
$$\mathrm{SFX_{y-1}} = \mathrm{AFX_{y-1}} - \mathrm{TFX}$$

$$\mathrm{SIC}_{y-1} = \mathrm{AIC}_{y-1} - \mathrm{TIC}$$

and

ART_y = *Annual Revenue Target for Year "y"*

RCy = *Revenue Cap for the current tariff adjustment year "y" as established in the last Rate Review Process*

RS_{y-1} = *Revenue surcharge for Year "y-1"*

$$\mathrm{TUVol}_{y-1} = \left\{\frac{\mathrm{kWh\ Target}_{y-1} - \mathrm{kWh\ Sold}_{y-1}}{\mathrm{kWh\ Target}_{y-1}}\right\} \times \textit{Non Fuel Rev Target for Energy } REV_{y-1}$$

$$+ \left\{\frac{\mathrm{kVA\ Target}_{y-1} - \mathrm{kVA\ Sold}_{y-1}}{\mathrm{kVA\ Target}_{y-1}}\right\} \times \textit{Non Fuel Rev Target for Demand } REV_{y-1}$$

$$+ \left\{\frac{\mathrm{\#Customer\ Charges\ Billed\ Target}_{y-1} - \mathrm{\#Customer\ Charges\ Billed}_{y-1}}{\mathrm{\#\ Customer\ Charges\ Billed\ Target}_{y-1}}\right\} \times$$

Non Fuel Rev Target for Customer Charges REV_{y-1}

Given that all tariffs charged to customers can be broadly allocated to three primary revenue buckets, namely, Energy, Demand and Customer Charge, the true-up mechanism will be operated on that basis. The revenue target for each year will be allocated to each bucket with the target quantities estimated to achieve each revenue bucket forming the basis for the true-up adjustment for each revenue bucket as outlined in the formulae above.

$TULos_{y-1} = Y_{y-1} * ART_{y-1}$

$Y_{y-1} = Ya_{y-1} + Yb_{y-1} + Yc_{y-1}$

Ya_{y-1} = *Target System Loss "a" Rate%*$_{y-1}$ – *Actual System Loss "a" Rate%*$_{y-1}$

Yb_{y-1} = *Target System Loss "b" Rate%*$_{y-1}$ – *Actual System Loss "b" Rate%*$_{y-1}$

Yc_{y-1} = *Target System Loss "c" Rate%*$_{y-1}$ – *Actual System Loss "c" Rate%*$_{y-1}$ * *RF*

where:

Ya = System losses that fall under subsection "a" of paragraph 38.

Yb = System losses that fall under subsection "b" of paragraph 38.

Yc = System Losses that fall under subsection "c" of paragraph 38.

RF =

The responsibility factor determined by the Office, which is a percentage from 0% to 100%. This responsibility factor shall 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 external environment that affected losses.

SFX_{y-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.

AFX_{y-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*

SIC_{y-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.

AIC_{y-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.*

dPCI = *Annual rate of change in non-fuel electricity revenues as defined below*

WACC = *The Weighted Average Cost of Capital determined in the Rate Review process.*

The annual Performance-Based Rate-Making (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; and*

Each of these essential components of the PBRM framework is described below:

The Growth Rate (dI)

The rate of change of the Revenue Target (dPCI) applied annually is the adjustment to the annual Revenue Cap as established during the 5 year rate review process.

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.

Specifically, dI is set as:

$$dI = (EX_n - EX_b)/EX_b \{USP_b + INF_{US}(USP_b - USDS_b)\} + INF_{us}(USP_b - USDS_b) + (1 - USP_b)INFJ$$

where

EX_b = *Base US exchange rate at the start of the Rate Review period.*

EX_n = *Applicable US exchange rate at Adjustment Date.*

INF_{US} = *Change in the agreed US inflation index as at 60 days prior to the Adjustment Date and the US inflation index at the start of the Rate Review period.*

INF_J = *Change in the agreed Jamaican inflation index as at 60 days prior to the Adjustment Date and the Jamaican inflation index at the start of the Rate Review period.*

USP_b = *US portion of the total non-fuel expenses as determined from the Base Year.*

$USDS_b$ = *US debt service portion of the non-fuel expenses as determined from financials in the Base Year of the rate setting period.*

The Z-Factor

Z = (Government Imposed Action + Impaired Assets + Funding of Special Programs)$_{y-1}$ – (Government Imposed Action + Impaired Assets + Funding of Special Programs)$_{RC\text{-}Base\text{-}year}$ + approved excessive variation in ROE catch-up + any variation in any other special circumstances as defined in clause 46d and not covered before"

Schedule 3, paragraphs 59 – 61 sets out the provisions regarding the conduct of an extraordinary rate review as follows:

> *59. The Licensee or the Minister may request the Office to conduct an extra-ordinary Rate Review owing to exceptional circumstances that have a significant impact on the electricity sector and/or the Licensee, but were not factors considered or known when the Rate Review was undertaken. The Office is empowered, to review the rates for this purpose outside of the five yearly Rate Review periods.*
>
> *60. For the avoidance of doubt, the Extra-ordinary Rate Review shall not result in a rescheduling of the time period for the next stipulated Rate Review.*
>
> *61. Where possible, the scope of such extra-ordinary Rate Review will be limited to the impact of the exceptional circumstances and therefore the review process is expected to be completed within a 60 day period, unless the Office and the Licensee agree otherwise."*

In accordance with Sections 4(4), 4(4A), 11 and 12 of the OUR Act, as well as Condition 15 and Schedule 3 of the Licence, the Office makes the **DETERMINATIONS** set out in the Executive Summary below.

2. Executive Summary

JPS submitted its application to the OUR for the annual review of Non-Fuel Base Revenue, and a request for an extraordinary rate review, in its document - Annual Tariff Adjustment Submission for 2017 & Extraordinary Rate Review dated 2017 May 05 ("Annual Review Submission 2017"). This review marks the second annual adjustment that is being sought under the Licence.

The following constitutes a summary of JPS' application and the determinations made by the Office in response. The content of the application and the reasoning applied by the Office in arriving at its determinations are set out in greater detail in subsequent sections.

2.1. Annual Inflation and Devaluation Growth Rate (dI).

In making the annual filings to the Office, JPS requested and provided support for adjustments to the following consumer price indices:

- The Jamaican point-to-point inflation rate 2014 March to 2017 March - **11.44%**, derived from the most recent CPI data[1] (INF_j)
- The U.S. point-to-point inflation rate 2014 March to 2017 March - **3.18%,** derived from the US Department of Labour statistical data[2] (INF_{us})

The accuracy of the changes in the indices has been verified by the OUR and in addition the Office has determined that the base rates for the foreign exchange movement should be increased from US$1: J$112.00 to **US$1: J$131.00**.

In accordance with the 2014 -2019 Determination Notice and the Licence:

Allowed **dI is determined to be 18.58%.**

2.2. Price Changes to Reflect Service Quality *(Q-Factor)*

The Q-factor is the allowed revenue adjustment which reflects the changes in the quality of service provided by JPS to its customers.

In accordance with the request of JPS, the 2014 -2019 Determination Notice and the Licence:

Q is determined to be 0%.

2.3. Allowed Adjustment due to Special Circumstances (*Z-Factor*)

In keeping with the Office's decision to use the Rate Base in the 2014-2019 Determination Notice as the reference point in the 2017 Jamaica Public Service Company Limited Extra-ordinary Rate Review 2017 Determination Notice, Document No. 2017/ELE/001/DET.001 (the "2017 Extraordinary Rate Review Determination"), the Z-factor compensation has been revised downward from US$15,146,585 to US$ US$14,985,466 over a one-year payment period.

Z is determined to be 4.89%.

[1] Obtained from the Statistical Institute of Jamaica, CPI Statistical Bulletin

[2] Obtained from US Bureau of Labour Statistics website, http://data.bls.gov/cgi-bin/surveymost

2.4. Total Non - Fuel Adjustment to Revenue Target

The annual adjustment to the Base Year$_{2014}$ Non-Fuel Revenue Requirement approved by the Office to become effective **2017 August 03 is 18.58%.** Additionally, JPS is allowed a Z-factor adjustment of 4.89% to the Base Year$_{2014}$ Non-Fuel Revenue Requirement. The Actual Non-Fuel Revenue collected by JPS for 2016 (J$46.85 billion) was adjusted to establish the Annual Non-Fuel Revenue Target for 2017 (J$48.26 billion). Effectively, the approved change to the Non-Fuel Revenue Requirement that was collected by JPS for 2016 is an increase of **3.02%**.

The details of the 2017 revenue adjustments are set out in Tables 2.1 and 2.2 below.

Table 2.1: Details of Revenue Adjustments (2017)

Annual Non-Fuel Revenue Adjustment 2017 (J$)	
Base Year$_{2014}$ Non-Fuel Revenue Adjusted with X-Factor of 1.10% (RC$_{2017}$)	40,157,997,389
Foreign Exchange, Interest and Non-Fuel Revenue Surcharges (SFX$_{2016}$ - SIC$_{2016}$ + RS$_{2016}$)	(2,001,420,124)
Extra-Ordinary Rate Review - CPLTD Adjustments	636,757,042
Adjustments to 2016 Rate Base	-
Adjustments to 2014 Rate Base (2017 Depreciation)	260,585,618
Annual Non-Fuel Revenue Target for 2017 (ART$_{2017}$)	**48,263,011,298**
Actual Non-Fuel Revenue for 2016	**46,848,679,836**
Effective Non-Fuel Revenue Change for 2017	**1,414,331,461**

Table 2.2: Details of Annual Inflation Adjustments (2017)

Annual Non-Fuel Revenue Adjustment 2017	
Growth Rate in Inflation and Exchange Rate (dI) for 2017	18.58%
Z-Factor	4.89%
dI adjustment and Z-Factor	**23.46%**
Change attributed to Surcharges,CPLTD & Rate Base Adj.	-3.41%
Change attributed to Actual Non Fuel Revenue for 2016 (Already accounted for in customers' bills)	16.66%
Effective Non-Fuel Revenue Change for 2017	**3.02%**

The effective adjustment of 3.02% to the revenue requirement is to be applied to the individual items in the tariff basket and the overall change in the tariff basket shall not exceed 3.02%.

2.4.1 Non-Fuel Tariff Table

Table 2.3 below shows the adjusted base non-fuel tariffs to be applied in the current 2017 - 2018 period.

Table 2.3: Inflation Adjusted Base Non-Fuel Tariffs (dI ± Q + Z)

Class		Energy-J$/kWh			Demand-J$/KVA			
		Block Rate Option	Customer Charge J$/Mth	Energy Charge J$/kWh	Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV	--100	442.27	9.59	-	-	-	-
Rate 10	LV	> 100	442.27	22.33	-	-	-	-
Rate 20	LV		985.29	18.42	-	-	-	-
Rate 40	LV - Std		6,941.83	5.73	1,777.51	-	-	-
Rate 40	LV - TOU		6,941.83	5.73	-	74.96	782.11	1,001.41
Rate 50	MV - Std		6,941.83	5.53	1,592.42	-	-	-
Rate 50	MV - TOU		6,941.83	5.53	-	71.01	692.92	889.03
Rate 70	MV -STD		6,941.83	3.68	1,515.61	-	-	-
Rate 70	MV -TOU		6,941.83	3.68	-	67.85	668.07	858.27
Rate 60	LV		2,799.13	24.02	-	-	-	-

2.4.2 The Electricity Efficiency Improvement Fund (EEIF)

JPS shall discontinue the collection of revenues through the EEIF, which was established in 2009 and collected through a separate line item on customers' bills. This accords with JPS' request.

The Office disapproves JPS' request to implement the System Benefit Fund (SBF) in place of the EEIF, for the purpose of house wiring in targeted communities.

Consistent with section 50 of the Electricity Act, 2015 however and in compliance with the request of the Ministry of Science, Energy and Technology (MSET), the Office has approved the establishment of the SBF for the purposes contemplated in the Act in the initial amount of US$5,000,000.00 in the first year. The Office therefore directs JPS to transfer from existing outstanding obligations to the EEIF the amount of US$500,000.00 each month over the next ten (10) months commencing 2017 September, to an account to be established by OUR for the SBF.

2.4.3 Residential Customers Prepaid Rates (Rate 10)

The approved non-fuel pre-paid rate is as follows:

- **J$15.0322/kWh** for the first 114kWh within a thirty (30) day consumption cycle
- **J$22.3270/kWh** for each additional kWh thereafter within that thirty (30) day consumption cycle

The prepaid rates shall be subject to change at the next Annual Review.

2.4.4 Small Commercial Customers Prepaid Rates (Rate 20)

The approved non-fuel tariff to be charged for Rate 20 prepaid service shall be revenue neutral when compared to the existing postpaid rates for Rate 20 customers and shall be applied as follows:

- **First 10kWh J$116.95/kWh**
- **Additional kWhs J$18.4234/kWh**

The prepaid rates shall be subject to change at the next Annual Review.

2.4.5 Community Renewal Rate (Rate 10)

The approved Community Renewal Rate to be charged for Rate 10 service is a flat rate of **J$9.59/kWh** for consumption up to 150kWh. Customers consuming more than 150kWh per month, will pay the regular prepaid or post-paid rate, whichever is applicable, for the incremental consumption above 150kWh per month. The Community Renewal Rate and conditions related to it shall be subject to change at the next Annual Review.

2.5. Interest on GOJ and Commercial Accounts

The Office issues its no objection to JPS using its preferred methodology to levy the late payment interest charge to the GOJ and commercial customers, once monthly, on balances that remain unpaid seven (7) days after the due date.

In accordance with the request of JPS, there shall be no disconnections of supply to GOJ and commercial customers, with accounts showing outstanding balances, until fourteen (14) days after the due date.

2.6. Adjustment to the Revenue Cap

Arising from changes to the rate of return on investment and adjustment to JPS' depreciation expenditure based on the OUR determinations made in the 2017 Extraordinary Rate Review Determination, the company's revenue cap expressed in 2014 Jamaican dollars has been revised to J$41,773,495,042 which is an upward adjustment of J$260,585,618.

2.7. Extraordinary Rate Review: Current Portion of Long Term Debt (CPLTD)

JPS' claim for the recovery of a return of J$336.7M in respect of unrecovered CPLTD returns in 2016 has been denied by the Office. The claim for J$636.7M for 2017 has been approved.

2.8. Wholesale Tariff (Rate 70)

The Office approves the introduction of a new interim rate class (Rate 70) for customers whose peak demand at a single location is at or above 2MVA.

2.9. Fuel Cost Adjustment Factor – System Losses

Technical Losses

The technical losses target applicable for the 2017/2018 rate adjustment period shall be **8.00%** of net generation. JPS had proposed a target of 8.40%.

Non-Technical Losses

The non-technical losses target within JPS' control shall be **3.30%**. JPS had proposed a target of 2.72%. The non-technical losses target not totally within JPS' control shall be **9.70%** with a responsibility factor **(RF) of 20%**. JPS had proposed a target of 15.39% and a responsibility factor of 10%.

2.10. Fuel Cost Adjustment Factor – Heat Rate

The Office determines that:

- The Heat Rate (actual) to be used by JPS in the defined Fuel Cost Adjustment Mechanism (FCAM) each month shall be based on the performance of JPS' thermal generating system.
- The approved Heat Rate target is applicable to JPS' thermal generating plants.
- The Heat Rate target for JPS' thermal generating system for the tariff period 2017 August to 2018 June shall be **11,450 kJ/kWh.** JPS had proposed a target of 11,720 kJ/kWh.

2.11. Bill Impact[3]

It is estimated that with the determinations set out herein, on the average, there will be a 1.8% overall reduction in the total on the average customer bill. This reflects the combined effects of:

a) the 18.58% (effectively 1.64%) increase in the base non-fuel Revenue Cap_{2014}
b) the Z-factor adjustment of 4.89%
c) the surcharge adjustment of -4.06%
d) Adjustment to the Rate $Base_{2014}$ of 0.65%
e) the CPLTD adjustment of 1.59%
f) the termination of the EEIF; and
g) the resetting of JPS Heat Rate Target from 11620 kJ/kWh to 11,450 kJ/kWh

The average bill impact across all rate classes is summarized in Table 2.4 below. The impact is as follows:

- Typical Rate 10 customer = -1.6% (Decrease)
- Typical Rate 20 customer = -1.6% (Decrease)
- Typical Rate 40 customer = -2.0% (Decrease)
- Typical Rate 50 customer = -2.0% (Decrease)
- Typical Rate 70 customer = -10.0% (Decrease) - *NEW[4]

[3] The bill impact was estimated on data received from JPS for 2017 June billing for electricity consumed in 2017 May.
[4] NEW is in reference only to the rate 70. These customers are being transferred from rate 40 and rate 50 classes and they are customers whose peak demand at a single location is at or above 2MVA. The 10% average reduction is the comparison of the rates they were paying in rate classes 40 and 50 to the rate they will now enjoy in rate class 70.

Table 2.4: Estimated Bill Impact of OUR Determined Annual Tariff Adjustment

Customer Class	Overall Bill Impact of the OUR Approved Rates			
	Typical Usage (kWh)	Demand (kVA)	Total Bill Impact (%)	Average Change (%)
RT 10 LV Res. Service < 100 kWh	90	n/a	-1.8%	**-1.6%**
RT 10 LV Res. Service 101-150 kWh	150	n/a	-1.6%	
RT 10 LV Res. Service > 150 kWh	200	n/a	-1.5%	
RT 20 LV Gen. Service < 100 kWh	90	n/a	-1.8%	**-1.6%**
RT 20 LV Gen. Service 100-1000 kWh	1,000	n/a	-1.6%	
RT 20 LV Gen. Service 1000-7500 kWh	5,000	n/a	-1.6%	
RT 20 LV Gen. Service > 7500 kWh	8,000	n/a	-1.6%	
RT 40 LV Power Service (Std)	35,000	100	-2.1%	**-2.1%**
RT 50 MV Power Service (Std)	500,000	1,500	-2.1%	
RT 50 MV Power Service (TOU-Partial Peak)	500,000	1,500	-2.1%	
RT 70 Power Service (Std) *NEW	500,000	2,000	-9.5%	**-9.8%**
RT 70 Power Service (TOU-Partial Peak) *NEW	500,000	2,000	-10.0%	
Efficiency Targets:	**System Losses Target**		**JPS Thermal Heat Rate Target**	
	Full Pass Through on Fuel		11,450 kJ/kWh	

Table 2.5 below shows the effect of the JPS proposed adjustments.

Table 2.5: Estimated Bill Impact of JPS Proposed Annual Tariff Adjustment

Customer Class	Overall Bill Impact of the JPS Proposal			
	Typical Usage (kWh)	Demand (kVA)	Total Bill Impact (%)	Average Change (%)
RT 10 LV Res. Service < 100 kWh	90	n/a	3.2%	**3.1%**
RT 10 LV Res. Service 101-150 kWh	150	n/a	3.1%	
RT 10 LV Res. Service > 150 kWh	200	n/a	3.1%	
RT 20 LV Gen. Service < 100 kWh	90	n/a	4.8%	**3.2%**
RT 20 LV Gen. Service 100-1000 kWh	1,000	n/a	2.8%	
RT 20 LV Gen. Service 1000-7500 kWh	5,000	n/a	2.6%	
RT 20 LV Gen. Service > 7500 kWh	8,000	n/a	2.6%	
RT 40 LV Power Service (Std)	35,000	100	2.0%	**1.6%**
RT 50 MV Power Service (Std)	500,000	1,500	1.5%	
RT 50 MV Power Service (Std)	500,000	1,500	1.3%	
RT 70 Power Service (Std) *NEW	500,000	2,000	-23.0%	**-20.4%**
RT 70 Power Service (TOU-Partial Peak) *NEW	500,000	2,000	-17.8%	
Efficiency Targets:	**System Losses Target**		**JPS Thermal Heat Rate Target**	
	Full Pass Through on Fuel		11,720 kJ/kWh	

3. Synopsis of JPS' Annual Review Submission 2017

This section captures extracts from JPS' Annual Review Submission 2017 that are relevant to the Office's determination on the company's application for rate adjustment.

3.1. Computation of Exhibit 1 Parameters

The Licence came into effect during the second year of the 2014-2019 Five Year Rate Review period. The Price Control provisions of the Licence introduced several parameters which were not considered in previous rate filings or determinations of the OUR. JPS, in its 2016 annual adjustment filing, outlined its position in relation to the new parameters set out in Exhibit 1. The OUR in the Jamaica Public Service Company Limited Annual Tariff Adjustment 2016 - Determination Notice Document No. Ele 2016/ELE/004DET.001 (the "2016 Annual Tariff Adjustment Determination") established those parameters, and that determination is now the basis for JPS' proposal relating to Exhibit 1 parameters in 2017.

JPS states that the Office decisions in the 2017 Extraordinary Rate Review Determination, also have a significant bearing on the parameters in its filing. Determinations 1, 3 and 4 were specifically identified as having particular bearing on the computation of the Revenue Cap for 2017 (RC_{2017}) and the application of the Z-factor.

3.1.1. The Rate of Change of Revenue Target (dPCI)

According to JPS, the OUR accepted the analysis and the parameters proposed by it in the 2016 annual adjustment filing and which were used as the basis for computing dI and consequently the adjustment factor, dPCI. JPS' expectation therefore is that there will be no further adjustments to these parameters.

The agreed values of the parameters were:

- USP_b =80%
- $USDS_b$ = 6.88% and
- EX_b =J$112:US$1

JPS asserts that the application of the adjustment factor dPCI will result in an increase of 23.52% to the base non-fuel revenue requirement in Jamaica dollar terms, derived using the following factors:

- Jamaican point-to-point inflation (INF_J) between 2017 March and 2014 March of 11.44%, derived from the CPI data[5] published by Statin;
- U.S. point-to-point inflation rate (INF_{US}) between 2017 March and 2014 March of 3.18%, derived from the U.S. Department of Labor statistical data[6] ; and
- 16.96% increase in the Base Exchange Rate $\left(\frac{\mathbf{EX_n - EX_b}}{\mathbf{EX_b}}\right)$ from J$112: US$1 to J$131.00: US$1.
- The Q-Factor set to zero.
- The computed value of the Z-factor is 4.94%. When multiplied by RC_{2017}, this computed value of the Z-factor will yield the US$15,146,585 that the OUR allowed

[5] Obtained from the Statistical Institute of Jamaica.

[6] Obtained from U.S. Bureau of Labor Statistics website, http://data.bls.gov/cgi-bin/surveymost

JPS to recover in accordance with Determination 4 of the 2017 Extraordinary Rate Review Determination.

Table 3.1 below sets out the details of the annual adjustment factor, dPCI that amounts to a 9.53% increase to RC_{2016} as proposed by JPS.

Table 3.1: JPS Proposed Rate of Change of Revenue Target (dPCI)

Annual Adjustment Clause Calculation			
ESCALATION FACTOR (dI) based on point to point data as at March 2017			
Line	Description	Formula	Value
L1	Base Exchange Rate		112.00
L2	Proposed Exchange Rate		131.00
L3	Jamaican Inflation Index		
L4	CPI @ Mar 2017		238.7
L5	CPI @ Mar 2014		214.2
L6	US Inflation Index		
L7	CPI @ Mar 2017		243.8
L8	CPI @ Mar 2014		236.3
L9	Exchange Rate Factor	(L2-L1)/L1	16.96%
L10	Jamaican Inflation Factor	(L4-L5)/L5	11.44%
L11	US Inflation Factor	(L7-L8)/L8	3.18%
L12	Escalation Factor	L9*{0.8+(0.8-0.0688)*L11}+(0.8-0.0688)*L11+(1-0.8)*L10	18.58%
L13	**Escalation Factor net of Q**	**dI - Q**	18.58%

3.1.2. The Revenue Cap for 2017 (RC_{2017})

The Licence describes the parameter RCy as the revenue cap for year "y" which should be established in the most recent rate review. Using the same rationale as established in 2016, JPS states that the revenue cap for 2017 is determined as follows:

$$RC_{2017} = (\text{Revenue Requirement Established in } 2014 - 2019 \text{ rate review}) \times (1 - X)^3$$

Where: X is the efficiency factor that was set at 1.10% in the 2014-2019 Determination Notice. The factor (1-X) is cubed to account for the three adjustment years from the establishment of the revenue requirement (that is, for the 2015 - 2016, 2016 - 2017 and 2017- 2018 adjustment years).

JPS argues that the above formulation for RC_{2017} does not contemplate Determinations 1, 3 and 4 of the 2017 Extraordinary Rate Review Determination. In that Determination Notice, the OUR concluded that in the treatment of JPS' asset impairment and depreciation costs spanning the period 2016 – 2028, the recovery of cost via the tariff shall be based on the following principles:

- Historical asset impairment and costs (i.e. for 2016) shall be recovered through the Z-factor mechanism;
- Future costs for the periods 2017 and 2018 shall be recovered through an adjustment of the revenue requirement in the existing tariffs.

- Future costs anticipated after 2018 will be addressed at the Five Year Rate Reviews.

JPS argues that it would require a projection of the fixed asset portion of JPS' rate base starting with the net book value (NBV) as of 2016 December as the base and then adding future costs for the periods 2017 and 2018 to implement the approach that the OUR has outlined in the 2017 Extraordinary Rate Review Determination.

JPS states that it is wary of a hybrid approach in which portions of the revenue requirement are based on 2013 costs and others based on costs incurred subsequent to that date. JPS however admits that it is aware of the dilemma arising from the need to capture the accelerated depreciation costs incurred after 2013.

In this regard, JPS indicates that the company is prepared to proceed as stipulated by the OUR to revise the fixed asset portion of the rate base using costs incurred subsequent to 2013. By way of letter dated 2017 April 27, JPS indicated however, that the company will defer the recovery of additional revenues on investments in fixed assets additions during 2017 and 2018 tariff periods until after the expenditure is incurred. JPS' rationale for its position is that the company is not yet in a position to implement the business processes and procedures necessary to sufficiently forecast the capital investment with the level of precision and granularity within the timeframe stipulated by the OUR. JPS however proposes that the 2016 rate base be used as a proxy for the 2017 and 2018 rate bases whilst reserving the right to request the incremental revenues in the tariff filings following each year.

Using the determinations in the 2016 Annual Tariff Adjustment Determination and the 2017 Extraordinary Rate Review Determination, JPS is proposing that the following formula be used to determine the revenue cap for 2017:

$$RC_{2017} = (\text{Revenue Requirement Established in } 2014 - 2019 \text{ rate review}) \times (1 - X)^3 + \text{Adjustments}/(1+dPCI).$$

JPS states that the above formula for RC_{2017} takes account of the methodology that would apply based on the agreed approach established in the 2016 Annual Tariff Adjustment Determination but also includes an additional term *Adjustments/(1+dPCI)* which was added to make allowance for the adjustments stipulated in Determination 1 of the 2017 Extraordinary Rate Review Determination. JPS argues that the "*Adjustments"* should not be subjected to inflationary adjustments given that it represents cost as of 2016 December. The company submits that the application of the Exhibit 1 formula for producing ART_{2017} would erroneously inflate the Adjustments if the deflator *1/(1+dPCI)* was not included to cancel the inflationary effect.

3.1.2.1. Computation of Adjustments to the Revenue Target for 2017

JPS adduces that in paragraph 6.3 of the 2017 Extraordinary Rate Review Determination, the OUR stated that the increased depreciation costs claimed by JPS going forward (i.e. from 2017 onward) requires a review of components of the revenue cap mechanism, as it is forward looking and can address costs prospectively. Additionally, JPS referred to the indication given by the Office that this component of JPS' claim would be addressed by way of a revision of

the rate base and the revenue requirement of the revenue-cap mechanism, and the resultant adjustment of the tariff going forward.

In keeping with this approach, JPS is of the view that adjustments to the rate base would be necessary so as to incorporate any forward looking rate base investments in 2017 and 2018 and to account for the impact of asset impairment adjustments already incurred. The sum of the return on equity (ROE), long term debt and gross up for taxes represents JPS' return on investments (ROI), which is obtained by multiplying the approved cost of capital (WACC) times the approved rate base. JPS argues that any revision to the approved rate base would require automatic adjustments to each of these components of the ROI which will subsequently be reflected in the adjusted revenue requirement.

JPS disagrees with the OUR that the adjustment to be included in the revenue requirement for increased depreciation expenses should be "an amount equivalent to the average annual increase in depreciation expenses expected in 2017 and 2018". JPS opines that the OUR may have misinterpreted Schedule 3, paragraph 6 of the Licence. JPS' interpretation is that separate revenue caps for each year of the review period is required. JPS says that this interpretation is consistent with the descriptions and terminologies used in Exhibit 1 of Schedule 3. It also points to paragraph 46 d(iii) of the Licence. JPS proposes separate revenue caps, RC_{2017} and RC_{2018}, for 2017 and 2018 respectively.

JPS argues that after factoring the time value of money and the efficiency improvement, the incremental change in depreciation expense amounts to U$17.523M. The company states that the total adjustments to the revenue target for 2017 to be the sum of the incremental depreciation expenses, incremental return on equity, incremental taxes and incremental long term interest expense. These amount to US$19.237M [J$2,520,085,974].

3.1.3. True Up for Volumetric Adjustments

JPS makes the case that the billing determinant targets for 2016 should be based on the actual billing determinants for 2015, barring any changes made by OUR to adjust the target billing determinants for known and measurable changes anticipated in relation to the following year. No adjustments were made in the 2016 Annual Tariff Adjustment Determination, therefore JPS proposed the billing determinant targets for 2016 as follows:

$kWh_{Target2016} = kWh_{Soldt2015}$

$kVA_{Target2016} = kVA_{Sold2015}$

$\#\ Customers\ Charges\ Billed_{Target[2016]} = \#\ Customers\ Charges\ Billed_{2015}$

where:

$kWh_{Sold\ 2015}$ = kWh billed in 2015

$kVA_{Sold\ 2015}$ = kVA billed in 2015

$\#\ Customers\ Charges\ Billed_{2015}$ = # Customers Charges Billed in 2015

JPS' computation of the TUVol2016 is presented in Table 3.2 below.

Table 3.2: Computation of Volumetric Adjustment

Volumetric Adjustment ($TUVol_{2016}$)			
Line	**Description**	**Formula**	**Value**
	Energy Surcharge		
L1	kWh $Target_{2016}$		2,972,549,058
L2	kWh $Sold_{2016}$		3,083,667,744
L3	Revenue Target for Energy		34,805,327,007
L4	kWh Surcharge	(L1-L2)/L1*L3	(1,301,079,347)
	Demand Surcharge		
L5	kVA $Target_{2016}$		5,194,994
L6	kVA $Sold_{2016}$		5,233,851
L7	Revenue Target for Demand		6,620,529,577
L8	kVA Surcharge	(L5-L6)/L5*L7	(49,519,476)
	Customer Count Surcharge		
L9	#Customer Charges Billed $Target_{2016}$		594,284
L10	#Customer Charges $Billed_{2016}$		623,982
L11	Revenue Target for Customer Charges		3,599,219,569
L12	Customer Charges Surcharge	(L9-L10)/L9*L11	(179,864,379)
L13	**$TUVol_{2016}$**	**L4+L8+L12**	**(1,530,463,202)**

3.1.4. FX and Interest Surcharges

JPS' calculation for the FX surcharge net of the interest surcharge is shown in Table 3.3 below.

Table 3.3: Computation of FX and Interest Surcharges

FX and Interest Surcharge for 2016 (SFX_{2016} - SIC_{2016})			
Line	**Description**	**Formula**	**Value**
	FX Surcharge		
L1	TFX		603,295,228
L2	AFX_{2016}		627,883,000
L3	**SFX_{2016}**	**L2-L1**	**24,587,773**
	Interest Surcharge		
L4	Actual net interest expense/(income) in relation to interest charged to customers for 2016		-
L5	Actual Net Late Payment fees for 2016		49,780,000
L6	AIC_{2016}	L4+L5	49,780,000
L7	TIC_{2016}		37,500,000
L8	**SIC_{2016}**	**L6-L7**	**12,280,000**
L9	**SFX_{2016} - SIC_{2016}**	**L3-L8**	**12,307,773**

3.1.5. Weighted Average Cost of Capital (WACC)

JPS states that the company is not proposing an adjustment to the WACC at this time and as such the WACC used in the filing is the pre-tax WACC that was set in the 2014 – 2019 Determination Notice.

3.1.6. System Losses and the Computation of $TULos_{2016}$

JPS proposes that the disaggregation of system losses for the purpose of computing $TULos_{2016}$ be based on the same methodology that was proposed in the 2016 annual adjustment filing as this was the basis on which the OUR established the targets for TL, JNTL and GNTL. JPS states that the company recognized some deficiencies in the use of the relative incidence of each factor methodology and is proposing an improved method for the OUR's consideration in setting the targets for the 2017/2018 annual adjustment period.

JPS' position is that the ART_{y-1} value for the computation of TULos2016 should be one half the revenue target that was set for 2016, that is, between 2016 July and 2016 December, as the company is said to have incurred a losses penalty between 2016 January and 2016 June under the incentive mechanism that operated under the price cap regime in which the losses penalty was applied to fuel cost. In this regard JPS proposes that TULos be computed by the formula:

$$TULos_{y-1} = 1/2Y_{y-1}*ART_{y-1}$$

JPS' computation of TULos2016 is as shown in Table 3.4 below.

Table 3.4: Computation of $TULos_{2016}$

Revenue Surcharge for 2015 (RS_{2015} = $TUVol_{2015}$ +$TULos_{2015}$)			
Line	**Description**	**Formula**	**Value**
	Losses Surcharge		
L14	Actual TL_{2016}		8.60%
L15	Target TL_{2016}		8.20%
L16	Ya_{2016}	(L15-L14)	-0.40%
L17	Actual $JNTL_{2016}$		4.48%
L18	Target $JNTL_{2016}$		3.50%
L19	Yb_{2016}	(L18-L17)	-0.98%
L20	Actual $GNTL_{2016}$		13.63%
L21	Target $GNTL_{2016}$		9.80%
L22	RF		20.00%
L23	Yc_{2016}	(L21-L20)*L22	-0.7660%
L24	Y_{2016}	L16+L19+L23	-2.15%
L25	ART_{2016}		45,025,076,153
L25	**$TULos_{2015}$**	**0.5*L24*L25**	**(483,119,067)**

3.1.7. The 2017 Revenue Target (ART_{2017})

JPS states that its application of the computed values of RC_{2017}, RS_{2016}, SFX_{2016} and SIC_{2016} to the annual adjustment formula:

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

results in a revenue requirement of J$49,856,384,730 an increase of 6.42% over the actual 2016 revenue.

3.2. Proposed 2017 Tariff Basket

JPS is proposing an annual adjustment factor of 6.42% which is to be applied to the actual 2016 revenue. Table 3.5 to Table 3.13 below show the data and the computed values for the JPS proposed 2017-2018 tariff period.

Table 3.5: 2016 Approved Non-Fuel Revenue Basket

	Block/ Rate Option		12 Months 2011 Customer Revenue	Energy Revenue	Demand (KVA) revenue				Total Demand Revenue	Total Revenue
					Std.	Off-Peak	Part Peak	On-Peak		
Rate 10	LV	<100 -	1,083,669,454	4,514,594,493					-	5,598,263,947
Rate 10	LV	>100 -	1,654,747,919	11,024,542,293					-	12,679,290,213
Rate 20	LV	-	693,511,619	10,672,506,900					-	11,366,018,519
Rate 40	LV - Std	-	132,935,155	3,622,676,533	3,883,146,311				3,883,146,311	7,638,757,999
Rate 40	LV - TOU	-	9,622,435	636,194,936		24,458,307	246,495,331	248,379,668	519,333,306	1,165,150,677
Rate 50	MV - Std	-	10,026,739	2,183,454,954	1,783,388,334				1,783,388,334	3,976,870,027
Rate 50	MV - TOU	-	1,859,798	497,474,420		21,798,554	199,517,853	213,345,219	434,661,626	933,995,844
Rate 60	LV	-	12,846,449	1,653,882,477					-	1,666,728,926
TOTAL			3,599,219,569	34,805,327,007	5,666,534,645	46,256,861	446,013,185	461,724,887	6,620,529,577	45,025,076,153

Table 3.6: JPS 2016 Actual Revenues

	Block/ Rate Option		12 Months 2011 Customer Revenue	Energy Revenue	Demand (KVA) revenue				Total Demand Revenue	Total Revenue
					Std.	Off-Peak	Part Peak	On-Peak		
Rate 10	LV	<100 -	1,111,313,583	4,767,199,582					-	5,878,513,165
Rate 10	LV	>100 -	1,761,219,804	11,876,154,274					-	13,637,374,078
Rate 20	LV	-	734,817,486	10,981,035,454					-	11,715,852,940
Rate 40	LV - Std	-	134,794,954	3,649,417,376	3,852,860,257				3,852,860,257	7,637,072,587
Rate 40	LV - TOU	-	9,541,574	653,980,100		24,338,099	246,130,412	249,123,120	519,591,631	1,183,113,306
Rate 50	MV - Std	-	10,431,043	2,294,728,970	1,931,569,388				1,931,569,388	4,236,729,401
Rate 50	MV - TOU	-	1,859,798	478,168,228		21,700,946	198,300,983	183,169,444	403,171,373	883,199,399
Rate 60	LV	-	14,118,052	1,662,706,908					-	1,676,824,960
TOTAL			3,778,096,295	36,363,390,892	5,784,429,645	46,039,045	444,431,394	432,292,564	6,707,192,649	46,848,679,836

Table 3.7: JPS 2016 Billing Determinants[7]

Class		Block/ Rate Option	Average 2016 Customer	Energy kWh	Demand-KVA			
				Std.	Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV	<100	215,717	522,146,723	-	-	-	-
Rate 10	LV	>100	341,870	558,614,971	-	-	-	-
Rate 20	LV		64,025	623,568,169	-	-	-	-
Rate 40	LV - STD		1,667	664,739,048	2,239,150	-	-	-
Rate 40	LV - TOU		118	119,122,058	-	335,420	325,092	256,987
Rate 50	MV -STD		129	433,786,195	1,253,037	-	-	-
Rate 50	MV -TOU		23	90,390,969	-	315,696	295,632	212,837
Rate 60	STREETLIGHTS		433	71,299,610	-	-	-	-
TOTAL			623,982	3,083,667,744	3,492,187	651,116	620,724	469,824

3.2.1. Proposal for a Wholesale Rate to Improve Economic Competitiveness

JPS argues that the introduction of liquefied natural gas (LNG) into the Jamaican market has been a major game changer for the industry as many of its larger customers are now seriously contemplating self-generation using gas as the fuel of choice. JPS proffers that its analysis indicates that the best alternative option (BAO) is at a cost which is lower than the grid cost for its larger customers as there is a real possibility of significant grid defection. JPS further contends that the impact of grid defection by the larger customers would be significant for other rate classes in that it could cause a significant increase in tariffs, and that given this consideration, it is proposing the introduction of a new rate class for customers whose peak demand at a single location is at or above 2MVA.

JPS is therefore proposing the introduction of a "wholesale" rate class (Rate 70) which it claims will allow its large customers to improve their international competitiveness.

Table 3.8: Billing Determinants with proposed Rate 70 Separated

Class		Block/ Rate Option	Average 2016 Customer	Energy kWh	Demand-KVA			
				Std.	Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV	<100	215,717	522,146,723	-	-	-	-
Rate 10	LV	>100	341,870	558,614,971	-	-	-	-
Rate 20	LV		64,025	623,568,169	-	-	-	-
Rate 40	LV - STD		1,663	661,052,032	2,220,365	-	-	-
Rate 40	LV - TOU		117	114,887,570	-	314,816	304,817	241,975
Rate 50	MV -STD		109	182,528,823	560,146	-	-	-
Rate 50	MV -TOU		19	47,274,641	-	171,029	153,913	119,012
Rate 70	MV -STD		24	254,944,388	711,676			
Rate 70	MV -TOU		5	47,350,816		165,271	161,994	108,837
Rate 60	STREETLIGHTS		433	71,299,610	-	-	-	-
TOTAL			623,982	3,083,667,744	3,492,187	651,116	620,724	469,824

[7] The energy data corresponds exactly to the earnings sheet value for Rate 20 and 60 Customers. For Rate 10, 40 and 50 the data is derived from CIS data obtained between 2015[2016] October and 2016[2017]January. Since the CIS system is an open item system, there were minor variances from the earning sheet total in the order of 0.1%. Customer count was determined using the best available method for counting customers (Source: JPS Submission). Note the reference to 2015 should have been 2016 October.

Table 3.9: 2016 Actual Revenues showing Separation of Proposed Rate 70 Revenue Requirement

	Block/ Rate Option		12 Months 2016 Customer Revenue	Energy Revenue	Demand (KVA) revenue				Total Demand Revenue	Total Revenue
					Std.	Off-Peak	Part Peak	On-Peak		
Rate 10	LV	<100 -	1,111,313,583	4,767,199,582					-	5,878,513,165
Rate 10	LV	>100 -	1,761,219,804	11,876,154,274					-	13,637,374,078
Rate 20	LV	-	734,817,486	10,981,035,454					-	11,715,852,940
Rate 40	LV - Std	-	134,471,510	3,629,175,655	3,820,537,077				3,820,537,077	7,584,184,243
Rate 40	LV - TOU	-	9,460,714	630,732,761		22,843,073	230,779,855	234,570,487	488,193,415	1,128,386,890
Rate 50	MV - Std	-	8,813,827	965,577,473	863,470,534				863,470,534	1,837,861,834
Rate 50	MV - TOU	-	1,536,355	250,082,851		11,756,543	103,240,435	102,422,521	217,419,500	469,038,706
Rate 70	MV -STD	-	1,940,659	1,349,393,218	1,100,422,034				1,100,422,034	2,451,755,911
Rate 70	MV -TOU	-	404,304	251,332,717		11,439,429	110,411,104	95,299,555	217,150,089	468,887,109
Rate 60	LV	-	14,118,052	1,662,706,908					-	1,676,824,960
TOTAL			3,778,096,295	36,363,390,892	5,784,429,645	46,039,045	444,431,394	432,292,564	6,707,192,649	46,848,679,836

Table 3.10: Proposed Annual Non-Fuel Revenue Adjusted per tariff

Class		Block/Rate Option	Customer Charge	Energy-J$/kWh	Demand-J$/KVA			
					Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV	–100	14.426%	9.874%				
Rate 10	LV	> 100	14.426%	9.874%				
Rate 20	LV		14.426%	9.890%				
Rate 40A	LV							
Rate 40	LV - Std		14.426%	9.390%	9.951%			
Rate 40	LV - TOU		14.426%	9.390%		9.951%	9.951%	9.951%
Rate 50	MV - Std		14.426%	8.933%	9.951%			
Rate 50	MV - TOU		14.426%	8.933%		9.951%	9.951%	9.951%
Rate 70	MV -STD		14.426%	-40.039%	-60.000%			
Rate 70	MV -TOU		14.426%	-40.039%		-60.000%	-60.000%	-60.000%
Rate 60	LV		14.426%	7.207%				

Table 3.11: Weighted Non-Fuel Adjustment

Class		Block/Rate Option	Customer Charge	Energy-J$/kWh	Demand-J$/KVA				
					Std.	Off-Peak	Part Peak	On-Peak	
Weighted increase									TOTAL
Rate 10	LV	–100	0.34%	1.00%	0.00%	0.00%	0.00%	0.00%	1.35%
Rate 10	LV	> 100	0.54%	2.50%	0.00%	0.00%	0.00%	0.00%	3.05%
Rate 20	LV		0.23%	2.32%	0.00%	0.00%	0.00%	0.00%	2.54%
Rate 40A	LV		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Rate 40	LV - Std		0.04%	0.73%	0.81%	0.00%	0.00%	0.00%	1.58%
Rate 40	LV - TOU		0.00%	0.13%	0.00%	0.00%	0.05%	0.05%	0.23%
Rate 50	MV - Std		0.00%	0.18%	0.18%	0.00%	0.00%	0.00%	0.37%
Rate 50	MV - TOU		0.00%	0.05%	0.00%	0.00%	0.02%	0.02%	0.09%
Rate 70	MV -STD		0.00%	-1.15%	-1.41%	0.00%	0.00%	0.00%	-2.56%
Rate 70	MV -TOU		0.00%	-0.21%	0.00%	-0.01%	-0.14%	-0.12%	-0.49%
Rate 60	LV		0.00%	0.26%	0.00%	0.00%	0.00%	0.00%	0.26%
TOTAL			1.16%	5.80%	-0.41%	-0.01%	-0.07%	-0.05%	6.42%

Table 3.12: Proposed Revenues for 2017/2018

Class		Block/ Rate Option	Customer Charge	Energy-J$/kWh	Demand-J$/KVA Std.	Off-Peak	Part Peak	On-Peak	Total Revenue
Rate 10	LV	–100	1,271,631,693	5,237,891,161	-	-	-	-	6,509,522,853
Rate 10	LV	> 100	2,015,293,392	13,048,751,666	-	-	-	-	15,064,045,058
Rate 20	LV		840,822,264	12,067,099,276	-	-	-	-	12,907,921,540
Rate 40A	LV		-	-	-	-	-	-	-
Rate 40	LV - Std		153,870,372	3,969,963,187	4,200,731,111	-	-	-	8,324,564,671
Rate 40	LV - TOU		10,825,516	689,959,947	-	25,116,261	253,745,507	257,913,357	1,237,560,588
Rate 50	MV - Std		10,085,310	1,051,828,040	949,397,287	-	-	-	2,011,310,637
Rate 50	MV - TOU		1,757,990	272,421,595	-	12,926,475	113,514,225	112,614,919	513,235,204
Rate 70	MV -STD		2,220,619	809,116,278	440,168,814	-	-	-	1,251,505,711
Rate 70	MV -TOU		462,629	150,702,842	-	4,575,772	44,164,442	38,119,822	238,025,506
Rate 60	LV		16,154,722	1,782,538,241	-	-	-	-	
TOTAL			4,323,124,506	39,080,272,232	5,590,297,212	42,618,508	411,424,174	408,648,098	49,856,384,730

Table 3.13: JPS Proposed 2017/2018 Tariff

Class		Block/ Rate Option	Customer Charge	Energy-J$/kWh	Demand-J$/KVA Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV	–100	491.24	10.03	-	-	-	-
Rate 10	LV	> 100	491.24	23.36	-	-	-	-
Rate 20	LV		1,094.39	19.35	-	-	-	-
Rate 40A	LV		-	-	-	-	-	-
Rate 40	LV - Std		7,710.48	6.01	1,891.91	-	-	-
Rate 40	LV - TOU		7,710.48	6.01	-	79.78	832.45	1,065.87
Rate 50	MV - Std		7,710.48	5.76	1,694.91	-	-	-
Rate 50	MV - TOU		7,710.48	5.76	-	75.58	737.52	946.25
Rate 70	MV -STD		7,710.48	3.17	618.50	-	-	-
Rate 70	MV -TOU		7,710.48	3.18	-	27.69	272.63	350.25
Rate 60	LV		3,109.07	25.00	-	-	-	-

3.3. Pre-paid Rates

3.3.1. Rate 10 Prepaid Rates

JPS is proposing the re-introduction of the two-tiered structure over the three-tiered structure which was requested by JPS and approved by the Office at the 2016 annual review. JPS argues that the two-tiered structure is required until its 2019 rate case filing for the Five Year Rate Review process, when the company is to present a cost of service study which could serve to potentially delink the revenue requirement of its post-paid customers from its pre-paid customers.

JPS is proposing that the non-fuel tariff for the Rate 10 prepaid customers should be as follows:

- $16.2917/kWh for the next 119kWh in a 30 day cycle
- $23.3592/kWh for every kWh above 119kWh in a 30 day cycle

3.3.2. Rate 20 Prepaid Rates

JPS' proposal for the non-fuel tariff for the Rate 20 prepaid customers using the proposed post-paid tariffs as the basis of the calculation are as follows:

- $128.7895/kWh for the first 10kWh in a 30 day cycle
- $19.3496/kWh for every kWh above 10kWh in a 30 day cycle

3.4. Community Renewal Rate

JPS argues that the Community Renewal Rate which has been in effect since 2016 July has not been implemented as the eligibility criteria has not yet been approved by the OUR.

JPS is proposing that the Community Renewal Rate for the 2017-2018 period for both post-paid and pre-paid customers be $10.03/kWh for up to 150kWh of consumption per month. JPS states that this rate will not attract a customer charge or any other charges as long as consumption remains below 150kWh in a billing cycle.

3.5. The Electricity Efficiency Improvement Fund (EEIF)

JPS is proposing that the EEIF be discontinued and instead the System Benefit Fund described in the Electricity Act, 2015 be implemented in its place. JPS argues that the company today is in a better position to raise funding to implement power delivery infrastructure and therefore the need for the EEIF as it was proposed is not as severe as in time past.

JPS further states that the challenge that the company is facing now is that customers in targeted communities are unable to afford the wiring of their houses and that the System Benefit Fund could assist in addressing this issue.

3.6. Performance and Initiatives for Factors Impacting Non-Fuel Tariffs

3.6.1. System Losses

JPS is reporting that its 12-month rolling system losses for 2016 was 26.71% compared to 26.98% in 2015 a decline of 0.27 percentage points. JPS claims that the generally downward trend is a direct result of the losses strategy that it has been employing.

3.6.2. 2017 Loss Reduction Initiatives

JPS reports that the strategies to be employed over the 2017-2018 period will be broken out into two major components: Technical Loss Reduction and Non-Technical Loss Reduction. The Technical Loss Reduction strategy is said to be geared primarily at correcting three (3) major issues: Power Factor Correction, Feeder Phase Balancing and Voltage standardization program. The strategies for the Non-Technical Loss Reduction which JPS claims is more complex due to the multifaceted nature of the issues faced, will be a four (4) pronged approach targeting Red Zone communities, Yellow Zone communities, Large Industrial and Commercial Customers and Internal Process Improvement.

3.7. Extraordinary Rate Review: Current Portion of Long-term Debt (CPLTD)

JPS argues that according to the Licence, the returns associated with the CPLTD which were excluded from the revenue requirement in the 2014 – 2019 rate review is recognised as a legitimate component of the cost structure of its business. JPS claims that the company should be allowed the opportunity of recovering this cost item prospectively as of the application date of the Licence. JPS also posits that the revenue target established in the 2016 annual tariff filing was set using the 2014 – 2019 Revenue Requirement (which excluded the CPLTD in the amount of US$37.49M) as the basis and therefore, the company is of the view that an adjustment is now required to the non-fuel rates to correct this exclusion. JPS is requesting

that the OUR consider this matter as an extraordinary rate review request in this Annual Review Submission 2017.

Given that the Licence came into effect in 2016 July, JPS is proposing that only half of the return on investment amounting to J$336,667,933 associated with the CPLTD for 2016 is to be recovered by JPS. Additionally, JPS is claiming the amount of J$636,675,042 for 2017 making a total of J$973,428,975 in recoverable cost.

JPS says that the recovery of costs associated with the CPLTD will result in a further 2.08% increase in revenues for 2017 over 2016 actual revenues. This will result in the Rate 10 bills increasing by a further 1.20% compared to the base case without the inclusion of the CPLTD. Similarly, Rate 20, Rate 40 and Rate 50 bills will increase by a further 1.0%, 1.01% and 0.72% respectively.

3.8. Ensuring Quality of Service – The Q-Factor

JPS states that the OUR and JPS have agreed that no baseline should be established for 2017 and thus, the company is not proposing one at this time. Consequently, JPS is proposing that the Q-Factor be set to 0 for the 2017/2018 tariff period.

3.9. Overview of Fuel Efficiency Mechanism (FCAM)

JPS states the company will not be opposed to the use of the thermal heat rate in the fuel pass through formula in light of the OUR's decisions in both the 2015 and 2016 Annual Determination Notices. The Office had determined that the Heat Rate Factor to be used in the FCAM should be the ratio of JPS Heat Rate target (thermal) to JPS heat rate actual (thermal).

3.9.1. Proposed Heat Rate Target

JPS proposes a new Thermal Heat Rate target of 11,720kj/kWh for 2017, which the company states, takes account of Forced Outage Outliers. JPS argues that this target is based on the planned mix of generating units, including IPPs, their projected availability and dispatch, other heat rate affecting variables and the possible variation in heat rate performance for reasons beyond JPS' control.

4. OUR's Analysis of the Proposal

4.1. Interpretation of Exhibit 1 Parameters

JPS rightly observes that OUR concurred with the position it outlined in relation to the parameters in its 2016 annual adjustment filing and that this was reflected in the 2016 Annual Tariff Adjustment Determination. It is also accepted that the decisions of the Office in the 2017 Extraordinary Rate Review Determination would be expected to have significant implications for the application of the parameters in the current filing. This is particularly so in respect of Determinations 1, 3 and 4 and also have a significant bearing on the computation of the Revenue Cap for 2017 (RC2017) and the application of the Z-factor.

The OUR's response to JPS' position on the establishment of these parameters is set out below.

4.2. Application of the Annual Revenue Cap Adjustment Formula

The Performance-Based Rate-Making (PBRM) formula is applied as outlined in the Licence. As provided for in the Licence, the annual rate of change in non-fuel electricity revenues (dPCI) is derived using the following factors:

- Jamaican point-to-point inflation (INFJ) between 2017 March and 2014 March of 11.44%, derived from the CPI data published by Statin (see Appendix 6.1.2);
- U.S. point-to-point inflation rate (INFUS) between 2017 March and 2014 March of 3.18%, derived from the U.S. Department of Labor statistical data (see Appendix 6.1.1); and
- The 16.96% increase in the Base Exchange Rate from J$112: US$1 to J$131.00: US$1.
- The Q-Factor is set at zero
- The computed value for the Z-Factor is 4.94%. When multiplied by the 2017 revenue cap (RC_{2017} = J$40.157 billion) it results in the approved amount of US$15,146,585 as determined in Determination 4 of the 2017 Extraordinary Rate Review Determination.

Table 4.1 below sets out the details of the annual adjustment factor, dPCI that amounts to a 18.58% increase to the revenue cap (RC_{2014}).

Table 4.1 Annual Escalation Adjustment Calculation (dI - Q)

Annual Adjustment Clause Calculation			
Line	Description	Formula	Value
L1	Base Exchange Rate		112.00
L2	Adjusted Billing Exchange Rate		**131.00**
L3	Jamaican Inflation Index		
L4	CPI @ March 2017		238.7
L5	CPI @ March 2014		214.2
L6	US Inflation Index		
L7	CPI @ March 2017		243.8
L8	CPI @ March 2014		236.3
L9	Exchange Rate Factor	(L2-L1)/L1	16.96%
L10	Jamaican Inflation Factor	(L4-L5)/L5	11.44%
L11	US Inflation Factor	(L7-L8)/L8	3.18%
L12	Escalation Adjustment Factor	L9*{0.8+(0.8-0.0688)*L11}+(0.8-0.0688)*L11+(1-0.8)*L10	**18.58%**
L13	**Escalation Factor net of Q**	**dI - Q**	**18.58%**

DETERMINATION 1

The 2017- 2018 Annual Inflation and Foreign Exchange Growth Rate (dI) is 18.58%.

4.2.1. Z-Factor Component of PBRM

The Z-factor is redefined under the Licence as follows:

"*(Government Imposed Action + Impaired Assets + funding of Special Programs)* $_{y-1}$ *– (Government Imposed Action + Impaired Assets + Funding of Special Programs)* $_{RC\text{-}Base\text{-}year}$ *+ approved excessive variation in ROE catch-up + any variation in any other special circumstances as defined in clause 4d and not covered before".*

Determinations 1 and 4 of the 2017 Extraordinary Rate Review Determination provide for the JPS to adjust its 2017 Revenue Cap (RC_{2017}) by a Z-factor amount to recover the US$15,146,585 of expenses. The details of the determinations are as follows:

Determination 1

JPS' asset impairment and incremental depreciation expenses arising from the application of the depreciation rates in Schedule 4 of the Licence 2016 is recoverable in its tariffs and shall be recovered as follows:

(a) The asset impairment costs incurred in 2016 shall be recovered applying the Z-factor mechanism;

(b) The projected increase in depreciation expenses in 2017 and 2018 shall be recovered by the adjustment of the revenue requirement in the existing tariffs;

(c) All projected increases in depreciation expenses in 2019 and beyond shall be addressed in future Five Year Rate Reviews.

Determination 4

(a) *JPS shall be allowed to recover US$13,378,012 of expenses caused by its 2016 depreciation asset impairment charge plus the associated opportunity cost. The recovery of these costs amounting to US$15,146,585 shall be recovered by way of the Z-factor mechanism over a one (1) year period.*

(b) *The Z-factor adjustment approved in this Determination 4 along with the Extraordinary Rate Review adjustment to be approved shall be implemented in 2017 July.*

(c) *Notwithstanding the above, the OUR reserves the right to adjust the timetable of the Z-factor implementation should conditions at the time of implementation so warrant.*

The Office's decision is to use the Rate Base in the 2014-2019 Determination Notice as the reference point for the Extraordinary Rate Review. In this regard, the Z-factor compensation has been revised downward from US$15,146,585 to US$ US$14,985,466 over a one-year payment period. See further details on the computation of the adjustment and the reason for the change in section 4.3 below.

Table 4.2 below shows the details of the amounts used in the computation of a Z-factor of 4.89%.

Table 4.2 Z-Factor Computation

Z-Factor	4.888%
J$131:US$1	
14,985,466	**US$**
1,963,096,046	**J$**
40,157,997,389	**RC_{2017}**

DETERMINATION 2

The 2017- 2018 Z-factor is 4.89%.

4.2.2. Q-Factor Component of PBRM

Background

As part of the annual review of the PBRM, incorporated in JPS' price control regime, defined under Schedule 3 of the Licence, the OUR is required to evaluate the quality of electricity service provided to customers by JPS each year and determine a Q-Factor for annual adjustment of the annual revenue target.

Quality of Service Principles

In the operation of the electricity system, the reliability of the transmission and distribution ("T&D") network and quality of service requirements, usually encompass three main aspects:

- Reliability of supply – the level of continuity/availability of electricity supply to customers;

- Power quality – primarily voltage quality; and
- Commercial quality – speed and accuracy with which customer requests and complaints are handled by the electric utility company.

Under the existing legal & regulatory framework for the electricity sector, JPS is designated the Single Buyer/System Operator with the obligation for the provision of electricity service to the country, subject to specific standards and requirements governing the aspects of System reliability and quality of service. These standards and requirements serve to incentivise the JPS to improve service quality across the System and to ensure that electricity is supplied to customers at an acceptable level of reliability.

The reliability performance of an electricity system is commonly assessed using the following reliability indices:

- SAIFI – System Average Interruption Frequency Index;
- SAIDI - System Average Interruption Duration Index;
- CAIDI - Customer Average Interruption Duration Index; and
- MAIFI - Momentary Average Interruption Frequency Index

Exhibit 1 of Schedule 3 of the Licence stipulates that the Q-Factor should be measured and assessed by an index derived from SAIFI, SAIDI AND CAIDI.

Exhibit 1 also indicates that the annual rate adjustment filing will follow the general framework where the rate of change in the Revenue Cap will be determined through the following formula*:* $\boldsymbol{dPCI = dI \pm Q \pm Z}$.

JPS' 2017 Q-Factor Proposal

In its Annual Review Submission 2017, JPS submitted that its 2016 system outage data set be the basis for Q-Factor review. In the submission, JPS notes the OUR's concerns regarding errors that were identified in the 2015 outage data set. JPS indicates that it welcomes the OUR's intent to continue discussions with the company in relation to the Q-Factor and to intensify its monitoring of the reported system outage data with the aim of ensuring that the Q-Factor incentive mechanism can be implemented and applied to annual PBRM. JPS notes that the company and the OUR have met to clarify issues related to the establishment of the Q Factor baseline and have agreed that JPS will continue improving its data quality with the objective of ensuring that the Q-Factor can be established at the 2019-2024 rate review process.

JPS also posits that in keeping with the OUR's intent to intensify monitoring of the reliability data, it intends to undertake a number of initiatives that will contribute to the improvement in reliability of its Q-Factor data capture. Given the present state of its Q-Factor capability, JPS has proposed that its **Q-factor be set to zero** for the 2017/18 period.

Regulatory Principles for Implementation of Q-Factor

For proper implementation of the Q-Factor, the OUR in consultation with JPS has previously established that, in principle, the Q-Factor should satisfy the following criteria:

1. Provide proper financial incentive to deliver a level of service quality based on customers' view of the value of that service quality;

2. Measurement and calculation should be accurate and transparent without undue cost of compliance;
3. There should be fair treatment for factors affecting performance that are outside of JPS' control, such as IPP forced outages, natural disasters, and other force majeure events, as defined under the Licence; and
4. It should be symmetrical in application, as stipulated in the Licence with appropriate caps or limits of effects on rates.

Based on the reliability and quality of service requirements of the Licence, the Q-Factor should be determined based on the average reliability performance across the entire system. This means that all the customers in the system should necessarily receive the same level of reliability, irrespective of their individual preferences. However, given the topology and geographical orientation of the system, and load density, among other things, this expectation is often not realised.

Q-Factor Implementation Issues

Implementation Issues

One of the prevailing challenges in the process of implementing the Q-Factor mechanism, has been the establishment of a reliable and credible baseline from which to measure changes in quality of service. From the perspective of the utility, the baseline is considered crucial to its expected annual revenue and would want to ensure that such baseline is reasonable, based on historical quality of service performance and is aligned to its quality of service projections presented in its five year business plan, at each Five Year Rate Review, as required by the Licence. While a Q-Factor adjustment to the non-fuel rate is required as part of the PBRM at each annual review, ongoing system outage data integrity concerns have hindered the establishment of a credible baseline.

Data Improvement Strategies

Arising out of an independent Q-Factor audit commissioned by the OUR, and conducted by KEMA (consultancy firm) in 2012, JPS committed to the implementation of an Outage Management System (OMS) to enable it to accurately collect and record system outage data. In its 2014-2019 Tariff Review Application, JPS indicated that it had acquired a new OMS.

Since the implementation of the OMS in 2013 December, JPS has had a number of issues with the system including interface problems with the Geographic Information System (GIS), the duplication of outage events, outage events with negative duration and the incorrect classification of outage events. Consequently, the full implementation of the OMS was delayed. However, JPS has reportedly taken measures to address these issues by engaging the OMS vendor to rectify the errors that were inherent to the OMS system and established a Rule Base Management of "Unique System Challenges".

This issue presented a major constraint to the capturing a complete annual outage data set for the evaluation of the Q-Factor. Accordingly, there was no credible basis to establish the Q-Factor baseline and this has delayed a definitive determination on the Q-Factor.

JPS Outage Data Quality

Based on the established framework for reporting the system outage data, at a given annual review of the PBRM, the reported outage data set required for the evaluation of the Q-Factor would normally represent the outage data collected for the previous calendar year. That is, the outage data set for Q-Factor review in JPS' 2016 annual tariff filing would be the complete outage data collected by JPS for 2015. So, for this 2017 Annual Review, the 2016 outage data set was submitted by JPS. The outage data was checked by the OUR and was found to contain details of service interruptions dated from 2016 January to December.

In analysing the reliability of the system using these outage data, an historical analysis, is usually carried out to derive the reliability performance indices at a disaggregated or system level. These historic data can be used as an indicator of future performance and serve as a guide to problem areas in the system which may require reinforcement.

Adequacy of JPS' OMS Data for Reliability Baseline

In the 2016 annual tariff filing and subsequent Q-Factor presentations to the OUR, JPS indicated that status of its OMS data was as shown in Table 4.3 below.

Table 4.3: Status of JPS' Outage Data Quality up to May 2016

ITEM	ACCURACY	COMPLETENESS	RANKING WRT UTILITY BEST PRACTICE
FEEDER MAPPING	98%	99%	Better than 90%
TRANSFORMER MAPPING	98%	99%	Better than 90%
TRANSFORMER TO FEEDER MAPPING	98%	99%	Better 90%
CUSTOMER TO TRANSFORMER MAPPING	84%	91%	75% - 90%
REPORTING PRACTICE			BEST/GOOD

JPS claimed that up to 2016 May, the accuracy and completeness of feeder mapping, the transformer mapping and the transformer to feeder mapping was well above the utility best practice and although the accuracy of the customer to transformer mapping scored the lowest, it was still within the range of utility best practice.

JPS reiterated that achieving high quality OMS data is a life cycle process as the grid undergoes daily changes due to operational configuration, growth, and network additions, as well as routine switching for maintenance. This therefore introduces many challenges in achieving 100% accuracy. JPS is continuing its efforts to improve the quality of the data and with the revision of the GIS Update Policy and the acquisition of ArcFM software, the company is better equipped to achieve and maintain a very high level of data accuracy and quality.

OUR's Comments

- In 2016, JPS admitted that the customer mapping issues it has experienced, have the potential to induce significant distortion and errors in customer location and count. This has important implications for information to aid service restoration and computation of the relevant quality indices. This suggests that there are still uncertainties surrounding accuracy and completeness of the outage data.

- JPS claimed that the accuracy and completeness of feeder mapping, the transformer mapping and the transformer to feeder mapping was well above utility best practice. However, JPS should recognize that these are indicative conditions/criteria applicable to utility practice and not necessarily a reference for regulatory outputs required for the Q-Factor.

OUR's Position on the Q-Factor

The application of the Q-Factor in the annual PBRM adjustment as required by the Licence is dependent on the setting of a reliable baseline, based on an accurate and complete outage data set. The review and analysis of previous outage data sets submitted to the OUR, prior to 2017, revealed a number of discrepancies. Efforts have been made by JPS to address same. These efforts on JPS' part have resulted in notable improvements in each successive data set submitted by JPS, despite some remaining challenges. Through a process of consultation between the OUR and JPS, the company is closer to the goal of having a credible baseline data set. Nevertheless, the OUR's review of JPS' Q-Factor for this 2017 Annual Review, identified a number of issues requiring further attention. These are discussed below:

- The number of errors in both the raw and the calibrated data sets, relating to duplication of records and incorrect classification of outage events, have been reduced to zero. However, a single outage event with negative duration was found in the raw data set. While this represents just a single deviation, based on the reported cause of this issue and commitment by JPS to eliminate them, the fact that they are still present at this stage is a major concern, which JPS is required to address urgently.

- In previous reviews of JPS' Q-Factor data submissions, it was discovered that JPS was using a single annual customer count (usually number at the end of year) for calculation of the relevant quality indices. JPS, however, indicated during consultations with the OUR during 2016 and 2017, that it had developed the capability of incorporating daily customer counts into its outage data. As such, the 2016 outage data set included daily customer counts which were used in the calculation of the reliability indices. However, the OUR's review revealed that there are unreasonably high variations in the daily customer count, in some instances. Additionally, total customer count used in the calculation of the quality indices do not appear to align with customer count data submitted to the OUR in regulatory reports and other data sources for the same reporting period. This situation therefore introduces uncertainties in relation to the accuracy of the calculated quality indices.

- The OUR's review revealed that there were a number of outage events included in JPS' raw outage data that were omitted from JPS' calibrated data for no indicated reason. Of these forty-two events, the majority were non-negative reportable outages which, in total, had an appreciable effect on the reliability indices calculated. These undefined alterations to the base data have distorted the calculation of the quality indices, preventing them from giving the true indication of the reliability performance.

- System outage data submitted to the OUR as part of different data sets were found to be incongruent with the 2016 system outage data, both in terms of the number of outage events and data categories. These disparities can introduce some level of doubt

regarding the validity and reliability of the outage information being submitted by JPS.

- The number of outage events designated by JPS as "Non-Reportable Forced Outage Events" appear to be high relative to the total forced outages (approximately 10%). These outages were apparently screened out from the raw outage data in the calibration process. While JPS has implemented its "Rules Based Data Dictionary" to deal with abnormalities in the outage data, it is not clear as to the specific nature of these outages and the basis of the classification as Non-Reportable in the raw data. This issue needs further discussion with JPS.
- The OUR has also noted that in order to ensure the accuracy and reliability of the collected outage data, it is critical that JPS review the status of its customer to transformer mapping programme for accuracy and completeness.
- The OUR's review found that the 2016 April 17 and August 27 major system outage data were not included in the calculation of the quality indices prescribed by the Licence on the basis that they resulted in a Major Event Day (MED). However, the indication of a MED does not provide a basis for relieving JPS of the Licence requirements in relation to the Q-factor. Moreover, the Licence makes no provision for the use of an MED reliability performance indicator in the Q-Factor. In that regard, it follows that without a separate regulatory instrument to address quality of service issues related to major system failures, then these outages must be included in the calculation of the quality indices prescribed by the Licence. Going forward, unless there are modifications to the existing licence requirements, the relevant outage for major system failures must be included in the calculation of the relevant quality indices.
- The OUR's review identified a number of outages that were reported to be caused by *Force Majeure* events, which were not included in the calculation of the relevant quality indices. However, any relief required for *Force Majeure* conditions should be in accordance with Condition 11, paragraph 2 of the Licence. For these outages to be excluded from the calculation of the quality indices, JPS would be required to provide evidence that the specific *Force Majeure* event actually occurred and that the company was excused from compliance with the Q-Factor requirements subject to the provisions of Licence.
- In the submission, JPS' proposed reliability improvement plan entailed activities involving the continuation of a lifecycle data management for the OMS and the increased use of automated technologies to aid in the reduction of outage troubleshooting time and improvement of outage response time. JPS indicates that the company has budgeted US$17.3 million for investment in these initiatives in 2017. However, the assessment of the Q-Factor for the 2019-2024 rate review will require JPS to develop a detailed reliability improvement plan, including a description of the proposed projects, costs, benefits, expected impact and project implementation time lines. This plan will also be a factor in setting the annual targets.
- For emphasis, all outages regardless of cause must be reported. The reported outage data should be fully disaggregated to the lowest level possible. Additionally, given the

urgency to have the Q-Factor implemented, after the effective date of this Determination Notice, JPS shall submit to the OUR the full outage data for each month for review. This is considered necessary to enable the detection of potential errors or issues with the data on a progressive basis and at shorter intervals.

- According to the Licence, the Q-Factor is based on the average reliability performance across the entire system, which means that all the customers in the system should necessarily receive the same level of reliability. Therefore, efforts should be made by JPS to improve service reliability in certain geographical areas of the system, to limit perceptions of discrimination.
- As part of the up-coming pre-Five Year Rate Review consultations involving the establishment of the relevant criteria for rate submission, JPS may want to consider engaging its customers to get a true understanding of their perspective on the quality of service being provided by the company. Customers could also be prompted to provide information needed to determine whether or not the allowed revenues currently in place reflect acceptable levels of reliability or if customers would be willing to pay more if reliability was enhanced.

OUR's Determination on JPS Q-Factor

The OUR's review of JPS' Q-Factor involving its 2016 system outage data, revealed that the company has made considerable progress towards ensuring that a robust outage data set is in place to set a Q-Factor baseline. However, there are still outstanding issues that need to be resolved before this objective can be achieved. As previously established, this will require strong collaboration between the OUR and JPS. Therefore, subject to the relevant regulatory requirements, the OUR intends to continue its consultations with JPS, on this issue with the aim of establishing the Q-factor baseline by the end of 2018 to facilitate the implementation of the Q-Factor incentive scheme at the 2019-2024 rate review.

For this 2017 Annual Review, the OUR concurs that this Q-Factor review should be focussed on improving the quality of the outage data to allow for the setting of a reliable Q-Factor baseline. As such, the Office determines that no adjustment will be allowed in the PBRM to reflect changes in the quality of service provided to customers by JPS for the 2017/2018 rate review period. Accordingly, the Q-Factor shall remain in the dead band.

DETERMINATION 3

The Q-Factor for the 2017 – 2018 annual review shall be 0%.

JPS shall within 15 days after the end of each month submit to the OUR the full outage data for that month.

4.3. Adjustments to the Revenue Requirement$_{2014}$

Background

In 2016 October, JPS submitted a request to the OUR for an extraordinary rate review. In the submission, the company argued that changes to the depreciation rate in the Licence, which took effect in 2016 January, had resulted in asset impairment amounting to approximately US$13.4 million in 2016 and an average increase in annual depreciation of approximately US$3.9 million in 2017 and 2018. Therefore, its tariffs should be adjusted to reflect the costs arising from the acceleration in the depreciation of its assets.

In light of the gravity and complexity of the issues involved the OUR engaged the services of financial experts to provide advice on whether JPS was correct in adjusting the depreciable lives of its assets, assess the appropriateness of the depreciation schedules in the Licence and to verify the accuracy of JPS' calculations. Based on the OUR's analysis and the advice received from its financial advisers the Office concluded in the 2017 Extraordinary Rate Review Determination that:

1. JPS would be allowed to recover US$13,378,012 of expenses caused by its 2016 depreciation asset impairment plus the associated opportunity cost by way of a Z-Factor adjustment.
2. The projected increase in depreciation expenses in 2017 and 2018 would be recovered by the adjustment of the revenue requirement in the existing tariffs. However, in order to determine the associated revenue adjustment based on a forward looking approach the OUR stipulated that JPS should provide the details of its investment plan for 2017 and 2018 within thirty (30) days of 2017 February 01.
3. The company would be required to conduct a new depreciation study prior to its 2019 Five Year Rate Review application. This new depreciation study should be based on guidelines established by the OUR.

In addition, the Office decided that the required changes to the JPS' rates arising from its asset impairment of 2016 and the projected increased depreciation expenses, for 2017 and 2018, would coincide with the time the 2017 annual rate review takes effect. The determinations set out in the 2017 Extraordinary Rate Review Determination and their underlying rational are reflected in the changes in the tariff for 2017/18.

The Z-factor Ruling

While the actual amount that JPS should receive by way of Z-factor pay out was determined to be US$13,378,012 plus the associated opportunity cost in the 2017 Extraordinary Rate Review Determination, the final decision on the magnitude of the adjustment under the Rate Review component was delayed until the 2017 Annual Review. As previously stated, this was done to allow JPS to provide additional information with respect to planned investments for 2017 and 2018.

Based on the decision taken in the 2017 Extraordinary Rate Review Determination the Z-factor compensation plus the opportunity cost for JPS' 2016 depreciation asset impairment translated to a payout of US$15,146,585 over a one (1) year period or US$16,030,872 over a two (2) year period.

Revision of the Z-factor Ruling

The Z-factor of US$13,378,012 determined in the 2017 Extraordinary Rate Review Determination included two components:

a) Asset impairment cost prior to the first half of 2016 amounting to US$11,323,968; and
b) Accelerated depreciation expenses for the second half of 2016 equal to US$2,054,044.

Notably, the US$11,323,968 asset impairment cost was derived exclusively on the basis of assets present in JPS' books as at 2013 December[8], while the US$2,054,044 accelerated depreciation in the latter half of 2016 included both the JPS 2013 December assets and new assets amounting to US$142,307 (see Table 4.17 below).

Upon further review, it was evident that the treatment of the accelerated depreciation in the two instances were different. Therefore, in keeping with the OUR's approach in this Determination Notice to use the Rate Base in the 2014 – 2019 Determination Notice as the reference point for all the Extraordinary Rate Review adjustments, of necessity the Z-factor computation in the 2017 Extraordinary Rate Review Determination must be revised downwards by US$142,306 for consistency. In this regard, the approved asset impairment for 2016 is US$13,235,706, and the revised Z-factor award which includes an opportunity cost (based on JPS' weighted cost of capital) of 13.22% is US$14,985,466 over a one-year recovery period.

Table 4.17 Composition of JPS' 2016 Asset Impairment & Incremental Depreciation Claim

	2016		2017	2018
	1st Half	2nd Half		
Asset Impairment	**11,323,968**			
Incremental Depreciation		**2,054,044**	**4,108,088**	**3,691,920**
- Assets as at 2013 Dec.		1,911,737	3,823,475	3,445,025
- Assets aquired after 2013 Dec		142,307	284,613	246,895

DETERMINATION 4

In keeping with the Office's decision to use the Rate Base in the 2014-2019 Determination Notice as the reference point for the Extraordinary Rate Review, the Z-

[8] It is important to note that the 2014 – 2019 Determination Notice uses 2013 as its Test-Year and 2013 December as the reference point for the Rate Base.

factor compensation for asset impairment costs, as determined in the 2017 Extraordinary Rate Review Determination, has been revised downward from US$15,146,585 to US$14,985,466, and shall be recovered over a one-year payment period.

Rate Review Analysis – Depreciation of Assets

The approval to permit JPS to recover for the cost of the acceleration in the depreciation of its assets, means that the OUR must take into account the fact that higher depreciation rates simultaneously lowers the NBV of assets. Hence, since both depreciation rates and the NBV are inextricably connected, the company's rate base ought to reflect those changes.

Further, if there are changes in the rate base, then the company's rate of return on investment included in the revenue requirement must be adjusted. Likewise, the increase in the depreciation rate expected in 2017 and 2018 ought to be adjusted in the revenue requirement in keeping with the forward looking revenue cap paradigm.

As set out in the 2017 Extraordinary Rate Review Determination**,** in keeping with Schedule 3 of the Licence, the changes to the tariff arising from the rate review based on the revenue-cap construct requires:

a) **A forward looking approach**: According to Schedule 3 of the Licence, *"[t]he 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."* While an extraordinary rate review inevitably takes place between five-year rate reviews, and therefore cannot look forward for five (5) years, it must still observe the forward looking revenue cap principle[9].

b) **An incremental approach*:*** Paragraph 61 of Schedule 3 of the Licence affirms *"[w]here possible, the scope of such extraordinary Rate Review will be limited to the impact of the exceptional circumstances."* In this regard, except for the items directly or indirectly impacted by the re-computation of the useful lives of the assets, all other items in the existing rate base should be held constant[10].

The OUR outlined the approach it had planned to take in this 2017 Annual Review exercise in the 2017 Extraordinary Rate Review Determination**.** One element of the approach involved an adjustment to the existing rate base to include the company's investments in 2017 and 2018. This is not a requirement under the Licence neither was it requested in JPS' 2016 October extraordinary rate review submission. However, it was seen as a channel through

[9] See Paragraph 5.1.3 of the Jamaica Public Service Company Limited Extraordinary Review 2017 Determination Notice: Document No.: 2017/ELE/001/DET.001

[10] See Paragraph 5.1.3, Ibid

which the transition process to the pure revenue cap regime could be advanced. Consequently, it was determined that JPS should:

> *"…provide details on each project in its investment plan for 2017 and 2018. The information provided shall include the purpose, a break-out of the cost into its components, the implementation schedule and the benefit to be derived from the specific investment, including any supporting return on investment projections"*[11].

In addition, JPS was required to submit this information to the OUR no later than 2017 March 03, that was thirty (30) days after the submission.

However, JPS failed to meet the deadline and despite a reminder letter sent on 2017 March 17, the company only responded on the 2017 April 29 (the eve of the due date for the Annual Review Submission 2017) stating:

> *"Regrettably, our investment plans are not supported by a platform that could readily forecast and provide, for each of the projects included in the 2017&18 capital programmes, the level of precision and granularity of detail required by the OUR."*

This the company argued was because it lacked the software system to generate the information. However, JPS further indicated that it is:

> *"…attempting to manually compile the details, starting with the 2017 projects, to submit to the OUR by May end 2017. We however caution that we are not confident that this will satisfy the OUR's expectations."*

To date, the OUR has not received the manual compilation of the investment data that JPS alluded to in its 2017 April 29 response. However, in its Annual Review Submission 2017, JPS proposed that in light of its inability to provide the investment data stipulated by:

> *"the recovery of additional revenues on investments in fixed asset additions over the 2017 and 2018 tariff periods until after the expenditure is actually incurred."*

Notwithstanding, its failure to submit the details of its investment plan, JPS is now claiming an incremental increase in depreciation expense of US$17.5 million for 2017. This claim is $13.4 million more than the request made, in its 2016 Extraordinary Rate Submission, for a US$4.1 million revenue adjustment in respect of accelerated depreciation expense projected for 2017. According to JPS, its preliminary forecast suggested a significant increase in capital investment in 2017 and 2018. These investments, it contends, will include the LED Street Lighting project, an Energy Storage project, as well as the possible refurbishing of two gas turbines (GT#8 and GT#11) that are currently not in the Rate Base. It is this preliminary forecast that has informed its proposal for an increase in the revenue requirement to capture incremental depreciation expense of US$17.5 million in 2017.

From a regulatory perspective, it must be recognized that:

- The Rate Base established in the 2014 -2019 Determination Notice, based on the 2013 Test Year, was not abrogated by the 2016 revisions to the Licence and is therefore still valid;

[11] See Determination 3, p.30, ibid

- Both the price cap and the revenue cap Rate Review regimes establish a tariff/ revenue path at the beginning of the Rate Review period either on the basis of a historic Test Year or by way of a forward-looking approach which rigorously examines the company's investment plans over the Rate Review period. Consequently, the notion of the utility presenting investment expenditure, which was not approved as a part of the Rate Review exercise, runs contrary to the inbuilt cost reduction incentive mechanism within both the Price Cap and Revenue Cap tariff regimes;
- When a tariff regime has been established, it is understood that the components of the rate base are not static. Consequently, the monetary value of the rate base and depreciation, in any given year, will go up and down depending on the retirement of assets and the investments that are made over the period. Therefore, the rate base and depreciation determined at a Rate Review are considered sacrosanct and changes can only be made between Rate Reviews where they are occasioned by special circumstances and permitted by the rules governing the tariff regime.

By dint of the JPS' own admission, it is clear that the company is not ready for some aspects of the revenue cap regime, at this time. In this regard JPS' proposal that revenues be adjusted for depreciation after the actual investments have taken place, is incompatible with a forward looking approach. The OUR therefore takes the view that its effort to accelerate this aspect of the revenue cap transition, as delineated in the 2017 Extraordinary Rate Review Determination, was premature. The Office has therefore taken the decision that is prudent that the Extraordinary Rate Review should be based on the Rate Base in the 2014 – 2019 Determination Notice. In this regard, the roll out of the aspect of the revenue cap regime requiring the timely presentation of the company's investments and business plan for regulatory scrutiny and approval shall await the 2019 Five Year Rate Review. The OUR therefore encourages JPS to put in place the necessary systems and resources that will allow for orderly and timely submission of its business plan as required in 2019 under the new tariff regime.

Against this background, the Office rejects JPS' proposal for incremental depreciation of US$17.5 million in 2017. However, consistent with the company's request in its 2016 Extraordinary Rate Review Submission, the Office approves the request for accelerated depreciation of US$3.8 million and US$3.4million in 2017 and 2018 respectively.

The OUR in its treatment of the expected increase arising from its accelerated depreciation expense for 2017 and 2018, will make the required incremental revision to the 2014 – 2019 Rate Base to reflect the situation in respect of the company's fixed assets affected at the end of 2016. In other words, this requires in the first place, the computation of the level of asset impairment that would have occurred at the end of 2013 December, had the new depreciation schedule in the Licence been applied to the assets affected by the accelerated depreciation at the end of 2016 December. Secondly, by reducing the existing 2014 -2019 Rate Base by the asset impairment derived in the computation, this would result in the revised Rate Base applicable to JPS going forward to the next Five Year Rate Review in 2019. Such an approach is decidedly incremental and accords with the salient principle of an extraordinary rate review set out in paragraph 61 of Schedule 3 of the Licence which states in part: "*Where possible,*

the scope of such extraordinary Rate Review will be limited to the impact of the exceptional circumstances..."

Rate Base Revision

An understanding of the anatomy of the alignment of JPS' costs with its revenue recovery mechanism as outlined in the Licence, suggests that these changes arising from the asset impairment and accelerated depreciation would impact the company's revenue requirement:

- directly through changes in its deprecation expenses; and
- indirectly through its return on investment via its rate base.

As previously discussed, the 2014 – 2019 Rate Base must be revised to reflect the adjustments made to the NBV of JPS' fixed assets arising from the application of the new depreciation schedule. Further, a necessary implication is that adjustments to the company's rate of return on investment, which along with the changes to the average depreciation expenses (for 2017 and 2018) would impact the revenue requirement.

As shown in Table 4.18 below, whereas the approved Rate Base was US$519.9 million in the 2014 – 2019 Determination Notice, after reducing the said Rate Base by the relevant asset impairment arising out of the application of the new depreciation schedule, the revised 2014 - 2019 Rate Base is US$510 million. In this regard, the US$510 million represents the revised Rate Base from which the rate of return on equity is to be derived through to the next Five Year Rate Review in 2019.

Table 4.18 Revised 2014 – 2019 Rate Base

	Determination 2014 - 2019
	US$'000
Property, Plant & Equipment	**698,571**
Additions	
- Intangible assets	9,877
- Long term receivables	1,447
Exclusions	
- Retired plants & Assets not used or useful	(9,495)
- Construction work in progress (CWIP)	(14,516)
- Capital reserve	(19,900)
- JPS managed IPP Assets	(43,319)
- EEIF Assets	(31,125)
Net Fixed Assets	**591,540**
Offsets	
- Customer deposits	(26,827)
- Employee benefit obligations	(6,908)
- Deferred expenditure (Tax)	(39,917)
- Deferred revenue	(1,654)
Total Long Term Assets	**516,234**
Net Current Assets (Working Capital)	3,657
APPROVED RATE BASE (2014 - 2019)	**519,891**
Regulatory Asset Impairment Adjustment @ 2013 Dec.	(9,891)
REVISED APPROVED RATE BASE (2014 - 2019)	**510,000**

DETERMINATION 5

The approved revised rate base for the 2014-2019 tariff period as at 2017 September 1 shall be US$510,000,000.

The Office rejects JPS' proposal for incremental depreciation of US$17.5 million in 2017. However, consistent with the company's request in its 2016 Extraordinary Rate Review Submission, the Office approves the request for accelerated depreciation of US$3.8 million and US$3.4million in 2017 and 2018 respectively.

Rate Review Adjustments

Return on Investment

The Office maintains that all the parameters in the weighted average cost of capital determined in the 2014 – 2019 Determination Notice should be held constant. However, given the adjustment to the rate base the approved rate of return on investment would be different.

Table 4.19 Adjustment to the Rate of Return on Investment

Item	OUR's 2014 - 2019 DETERMINATION		CHANGE
	Original	Revised	
Cost of Debt	8.07%	8.07%	-
Rate of Return on Equity (ROE)	**12.25%**	**12.25%**	-
Tax Rate	33.33%	33.33%	-
Gearing Ratio (Deemed)	50.00%	50.00%	-
Post-tax WACC	8.81%	8.81%	-
Pre-tax WACC	**13.22%**	**13.22%**	-
	US$'000	**US$'000**	**US$'000**
Rate Base	**519,891**	**510,000**	**(9,891.00)**
Return on Equity	31,837	31,238	(599.50)
Taxation (Gross up)	15,918	15,616	(301.59)
Long Term Interest Expenses	20,985	20,579	(406.50)
Value of WACC	**68,740**	**67,432**	**(1,307.59)**

Table 4.19 above shows that holding the pre-tax WACC at 13.22% and applying it to the new rate base of US$510 million results in a rate of return on investment of US$67.4 million. This is US$1.3 million lower than the amount allowed in the 2014 -2019 Determination Notice.

Depreciation

As previously indicated, JPS in its 2016 Extraordinary Rate Review Submission requested increases in the revenue requirement to capture the effect of accelerated depreciation amounting to US$4.1 million and US$3.7 million in 2017 and 2018 respectively. However, the amounts included adjustments for assets that existed at the last Rate Review as well as assets acquired after 2013 December. In light of the Office's decision to anchor the 2017 Extraordinary Rate Review in the Rate Base determined in the 2014 – 2019 Determination Notice, the allowed increase in depreciation in 2017 and 2018 must be based exclusively on the assets that were in the Rate Base as at 2013 December. Accordingly, the allowed increase in depreciation for 2017 and 2018 are US$3.8 million and US$3.4 million respectively. This translates to an average increase of US$3.6 million in depreciation expenses over the two (2) year period.

Revised 2014 - 2019 Revenue Requirement

The net effect of the lowering of the rate of return and the increase in the depreciation expenses results in the 2014 -2019 revenue requirement moving from US$370.7 million to approximately US$373.0 million. An increase of US$2.3 million (see Table 4.20 below)

Table 4.20 Adjustment to the Revenue Requirement

ITEM	Revenue Requirement	
	US$	J$
2014 -2019 Revenue Requirement	**370,650,977**	**41,512,909,424**
Plus - Extraordinary Adjustments	**2,326,657**	**260,585,618**
Rate of Return on Investment	(1,307,593)	(146,450,382)
Depreciation	3,634,250	407,036,000
Revised 2014-2019 Revenue Requirement	**372,977,634**	**41,773,495,042**
Change in Revenue Requirement	2,326,657	260,585,618
Percentage Change	0.6%	0.6%

2014 Base Exchange Rate (J$/US$)	**112.00**

This means that JPS' revenue cap for 2017/18 (RC_y) is J$41,773.5 million. The formulation is stated in 2014 Jamaican dollars, and is based on the associated base exchange rate of J$112 to US$1.

DETERMINATION 6

Based on changes to JPS' rate of return on investment and depreciation expenditure arising from modifications to the depreciable lives of the company's fixed assets, revenue cap expressed in 2014 Jamaican dollars has been revised to J$41,773,495,042 which represents an upward adjustment of J$260,585,618 to the 2014 – 2019 revenue requirement.

4.4. FX, Interest and Revenue Surcharges for 2015 (SFX_{2015} - SIC_{2015} + RS_{2015})

The adjustment mechanism set out in the Licence allows for a revenue surcharge which includes a true-up for the previous year's under/over-recovered revenues, system losses incentive mechanism and a FX surcharge offset by income received for interest paid by customers.

The Licence states that the revenue cap is the revenue requirement approved in the 2014 – 2019 rate review as adjusted for the rate of change in non-fuel electricity revenues at each

annual adjustment date. Furthermore, the Licence stipulates that the Annual Revenue Target shall be adjusted on an annual basis commencing 2016 July 01 (the Adjustment Date). The methodology for the computation for the $TUVol_{2016}$ is as follows:

y =2017 the current year

$$TUVol_{y-1} = \left\{\frac{\text{kWh Target}_{y-1} - \text{kWh Sold}_{y-1}}{\text{kWh Target}_{y-1}}\right\} \times \textit{Non Fuel Rev Target for Energy } REV_{y-1}$$

$$+ \left\{\frac{\text{kVA Target}_{y-1} - \text{kVA Sold}_{y-1}}{\text{kVA Target}_{y-1}}\right\} \times \textit{Non Fuel Rev Target for Demand } REV_{y-1}$$

$$+ \left\{\frac{\text{\#Customer Charges Billed Target}_{y-1} - \text{\#Customer Charges Billed}_{y-1}}{\text{\# Customer Charges Billed Target}_{y-1}}\right\} \times \textit{Non Fuel Rev Target for Customer Charges REVy-1}$$

The formula indicates that the volumetric adjustment for any year is dependent on the variance between the target billing determinants for that year and those that were actually achieved during the year.

Schedule 3, paragraphs 44 and 45 of the Licence further clarify how the target billing determinants should be determined, and are outlined as follows:

> **Paragraph 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."*
>
> **Paragraph 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."*

The Office was not aware of any known and measurable change that would have impacted the actual billing determinants for 2015 and therefore no adjustment was made to the actual numbers for 2015 in setting the target billing determinants for 2016.

The billing determinant targets for 2016 are given as follows:

$kWh_{Target2016} = kWh_{Sold2015}$
$kVA_{Target2016} = kVA_{Sold2015}$
Customers $Charges_{Target2016}$ = # Customers $Charges_{Billed2015}$
where:
$kWh_{Sold2015}$ = kWh billed in 2015
$kVA_{Sold2015}$ = kVA billed in 2015
Customers $Charges_{Billed2015}$ = # Customers Charges Billed in 2015

The non-fuel revenue targets for energy, demand and customer charge are matched to the respective components of the target billing determinants. Since the billing determinant targets for 2016 are the actual billing determinants for 2015, the non-fuel revenue targets for energy, demand and customer charge are the products of the 2016 approved prices and the 2015

quantities for each revenue category. For this reason, the 2016 non-fuel revenue targets for energy, demand and customer charge are based on those in Table 5.7 of the 2016 Annual Tariff Adjustment Determination (see Table 4.21 below).

Table 4.21 - *Table 5.7 Approved Annual Revenue Target: 2016-2017*

Class	Block/Rate Option	Customer Charge	Energy-J$/kWh	Demand-J$/KVA				Total Revenue
				Std.	Off-Peak	Part Peak	On-Peak	
								0
Rate 10 LV	--100	1,083,661,233	4,514,321,729	0	0	0	0	5,279,468,298
Rate 10 LV	> 100	1,654,735,366	11,024,351,975	0	0	0	0	11,957,671,206
Rate 20 LV		693,510,460	10,673,776,545	-	-	-	-	10,720,509,832
Rate 40A		-	-	-	-	-	-	-
Rate 40 LV - Std		132,935,202	3,624,335,217	3,883,154,552	-	-	-	7,205,699,213
Rate 40 LV - TOU		9,622,439	636,486,225	-	24,457,781	246,494,686	248,378,861	1,099,128,655
Rate 50 MV - Std		10,026,743	2,183,888,674	1,783,387,119	-	-	-	3,751,001,529
Rate 50 MV - TOU		1,859,799	497,573,238	-	21,798,949	199,516,449	213,344,453	880,944,766
Rate 60 LV		12,846,438	1,653,646,649	-	-	-	-	1,571,672,776
TOTAL		3,599,197,680	34,808,380,252	5,666,541,670	46,256,730	446,011,134	461,723,314	45,028,110,780

4.4.1. Comment on Interest Surcharges

Schedule 3, paragraph 49 of the Licence, entitles JPS to "charge late payment interest to the GOJ and customers, other than residential customers [commercial customers], who do not pay their bills in full by the due date". Schedule 3, paragraph 52 of the Licence also entitles the company to "charge a late payment fee to residential customers and offer an early payment incentive fee for payments made on time and in full by the due date."

In the 2016 Annual Tariff Adjustment Determination, the Office allowed a provisional sum of J$37.5 million as the target for the 2016 interest income and this was offset against the provisional amount of J$603.3 million (US$4.9 million) for foreign exchange losses to be incurred in 2016. These provisions were made with the reasonable expectation that JPS would make good on all its interest income entitlements.

From the Annual Review Submission 2017, the OUR notes that JPS is exercising its entitlement in collecting the late payment fees and in offering the early payment incentive to its residential customers. However, the evidence suggests that JPS has not acted on its entitlement to charge the late payment interest to the GOJ and commercial customers.

In response to the OUR's request for the reasons for not acting on its full entitlement JPS by way of letter dated 2017 June 26 advised that:

> *…"There has been a delay in implementing interest charges on overdue payments from commercial rate class customers, including the Government of Jamaica and related public entities. This is as a result of the incapacity of Banner, the customer information system (CIS) used by JPS, to precisely calculate interest charges on outstanding customer balances (on each past due open item for each account) from the due date to the date each item is settled. This has been a part of the implementation challenge faced in the foregoing months as it would be extremely challenging to complete such calculations outside of a system-based approach (for example using Excel). As of June 2016, several options were reviewed to identify an appropriate solution – from the possible modification of Banner to execute the function, to other systems that would operate independently of the CIS."*

JPS stated further that the company has engaged the Hanson Group (Banner Developers) to develop and implement the modification required for Banner and that the process is well advanced and anticipates implementation by 2017 August 31. JPS further stated that the preferred methodology is to levy the late payment interest charge once monthly on balances that remain unpaid seven (7) days after the due date.

In this regard, the JPS is seeking the OUR's no objection to its preferred methodology of levying the late payment interest charge once monthly on balances that remain unpaid seven (7) days after the due date with no disconnections occurring until seven (7) days later. JPS states that this methodology recognises that qualifying customers would have had twenty four (24) days credit from the billing of their post-paid consumption to the application of interest as it allows seventeen (17) days to the due date and a further seven (7) days before interest is applied. According to JPS, the company will ensure that there will be no disconnection until thirty-one (31) days after the billing date.

JPS advises that where interest is to be applied to an account, a full month's interest will be charged on the expiration of day seven after the bill becomes due. If the customer pays within the seven (7) days there is no charge.

The OUR has no objection to the JPS preferred methodology to levy the late payment interest charge on the GOJ and commercial customer. The OUR wishes to alert JPS that if it fails to implement same, in the next Annual Review, the OUR will deem an amount to offset against the FX surcharge.

DETERMINATION 7

The Office issues its no objection to JPS using its preferred methodology to levy the late payment interest charge to the GOJ and commercial customers once monthly on balances that remain unpaid seven (7) days after the due date.

There shall be no disconnections of supply to GOJ and commercial customers with accounts showing outstanding balances, until fourteen (14) days after the due date.

Table 4.22 below sets out the details of the computation of the applicable surcharge adjustments.

Table 4.22: OUR Determined FX, Interest and Revenue Surcharges for 2016 (SFX_{2016} - SIC_{2016} + RS_{2016})

FX, Interest and Revenue Surcharges for 2016 (SFX_{2016} - SIC_{2016} + RS_{2016})				
Line	**Description**	**Amount**	**Formula**	**Value (J$)**
	FX Surcharge			
L1	TFX			
L2	AFX_{2016} **(Less 2016 Provision)**			**24,587,773**
L3	**SFX_{2016}**		**L2-L1**	**24,587,773**
	Interest Surcharge			
L4	Actual net interest expense/(income) in relation to interest charged to customers for 2016 **(Less 2016 Provision)**			**(37,500,000)**
L5	Actual Net Late Payment Fees for 2016			**49,780,000**
L6	AIC_{2016}		**L4+L5**	**12,280,000**
L7	TIC_{2016}			-
L8	**SIC_{2016}**		**L6-L7**	**12,280,000**
L9	**SFX_{2016} - SIC_{2016}**		**L3-L8**	**12,307,773**
	Revenue Surcharge (RS_{2016})			
L10	kWh $Target_{2016}$	2,972,549,058		
L11	kWh $Sold_{2016}$	3,083,667,744		
L12	Non Fuel Revenue Target for Energy Rev_{2016}	34,808,380,252		
L13			**(L10 - L11)/L10 x L12**	(1,301,193,482)
L14	kVA $Target_{2016}$	5,194,994		
L15	kVA $Sold_{2016}$	5,233,851		
L16	Non Fuel Revenue Target for Demand Rev_{2016}	6,620,532,849		
L17			**(L14 - L15)/L14 x L16**	(49,519,501)
L18	# of Customer charges billed $Target_{2016}$	594,284		
L19	# of Customer charges billed Act_{2016}	623,982		
L20	Non Fuel Rev Target for Customer Charges Rev_{2016}	3,599,197,680		
L21			**(L18 - L19)/L18 x L20**	(179,863,285)
L22	**$TUVol_{2016}$**		**L13 + L17 + L21**	**(1,530,576,268)**
L23	Target System Loss "Technical Losses" $(\%)_{2016}$	8.20%		
L24	Actual System Loss "Technical Losses" $(\%)_{2016}$	**8.60%**		
L25			**L23 - L24**	-0.40%
L26	Target System Loss "Portion of Non-technical losses which is completely within JPS' control" $(\%)_{2016}$	3.50%		
L27	Actual System Loss "Portion of Non-technical losses which is completely within JPS' control" $(\%)_{2016}$	**4.48%**		
L28			**L26 - L27**	-0.98%
L29	Target System Loss "Portion of Non-technical losses which is not completely within JPS' control" $(\%)_{2016}$	9.80%		
L30	Actual System Loss "Portion of Non-technical losses which is not completely within JPS' control" $(\%)_{2016}$	**13.63%**		
L31	RF-Responsibility Factor determined by the Office (%)	20.0%		
L32			**(L29 - L30) x L31**	-0.77%
L33	Y_{2016} System Losses		**L25 + L28 + L32**	-2.15%
L34	ART_{2016}			45,028,110,780
L35	**$TULos_{2016}$**		**L33 x L34**	**(483,151,629)**
L36	**RS_{2016} = $TUVol_{2016}$ + $TULos_{2016}$**		**L22 + L35**	**(2,013,727,896)**
L37	**SFX_{2016} - SIC_{2016} + RS_{2016}**		**L9 + L36**	**(2,001,420,124)**

DETERMINATION 8

The annual revenue target for 2017 shall be adjusted by a surcharge (SFX_{2016} - SIC_{2016} + RS_{2016}) of –J$2.0Billion. The weighted average cost of capital (WACC) that was determined at the 2014 rate review shall be applied to the surcharge.

4.5. System Losses

System Losses Determination for JPS 2018/19 Revenue Adjustment

The 2016 Annual Review signalled a departure from the approach used to quantify system losses that was established in the 2014 – 2019 Determination Notice. In the 2014 -2019 Determination Notice, the system losses target was broken down into a technical target and non-technical target. In keeping with Schedule 3 of the Licence, the system losses differential between the target and the actual has been disaggregated into three components:

a) Technical losses (Ya) : TL
b) Non-technical losses fully under JPS' control (Yb) :JNTL
c) Non-technical losses partially under JPS' control (Yc) : GNTL

The Responsibility Factor (RF) is critical to the determination of the portion of the non-technical losses under Yc for which JPS is held accountable. The portion of system losses for which JPS is held accountable is the product of Yc and the Responsibility Factor. The total system losses for which the company is held accountable for, may be expressed in percentage term as:

$$Y_{y-1} = Ya_{y-1} + Yb_{y-1} + Yc_{y-1}$$

Where:

Ya_{y-1} = (Non-technical losses target – Actual non-technical losses)

Yb_{y-1} = (Non-technical losses target – Actual non-technical losses)

Yc_{y-1} = (Non-technical losses target – Actual non-technical losses)*RF

And, y-1 refers to the event in the previous year

In translating system losses to a monetary value, the total system losses differential (Y_{y-1}) must be multiplied by Actual Revenue Target in the previous year (ART_{y-1}) which may be expressed as:

$$TULosy\text{-}1 = Y_{y-1} * ART_{y-1}$$

It is significant to note that the system losses adjustment construct delineated above is a symmetrical incentive/penalty mechanism. If JPS underperforms it will be penalized since its revenues would be reduced. Alternatively, if the company out-performs the targets in aggregate terms, then it will receive additional compensation by way of higher revenues. Additionally, the application of the system losses mechanism has changed under the Licence. Prior to 2016 July, the system losses mechanism was applied on a monthly basis to the JPS fuel cost. However, under the new arrangement the mechanism is applicable instead to the company's non-fuel revenue on an annual basis.

As shown in Table 4.23 below, JPS in its Annual Review Submission 2017 has proposed that its:

- technical losses target be increased from 8.2% to 8.4%;
- non-technical losses target for which it is fully responsible be reduced from 3.5% to 2.5%;
- non-technical losses target for which it is partially responsible be increased from 9.8% to 14.0%; and
- Responsibility factor be slashed from 20% to 10%

Table 4.23 System Losses, Targeted, Actual & Proposed

Component	Symbol	2016/17		2017/18
		Target	Actual	Proposed
Technical (TL)	Ya	8.20%	8.60%	8.40%
Non-technical (Full) JNTL	Yb	3.50%	4.48%	2.50%
Non-Technical (Partial) GNTL	Yc/RF	9.80%	13.63%	14.00%
Responsibility Factor	RF	20.00%	20.00%	10.00%
Regulated Total Losses	**Y**	**13.66%**	**15.81%**	**23.50%**
Effective Total Losses		24.56%	26.71%	

Background on JPS System Losses

System losses, calculated on a twelve-month rolling average performance basis, was at 16.58% at year end 2001. However, over the years it has increased peaking at 27% in 2015 and dipping slightly to 26.71% of net generation at the end of 2016.

In the 2009-2014 Determination Notice the OUR recognizing the challenges that JPS was facing in dealing with system losses:

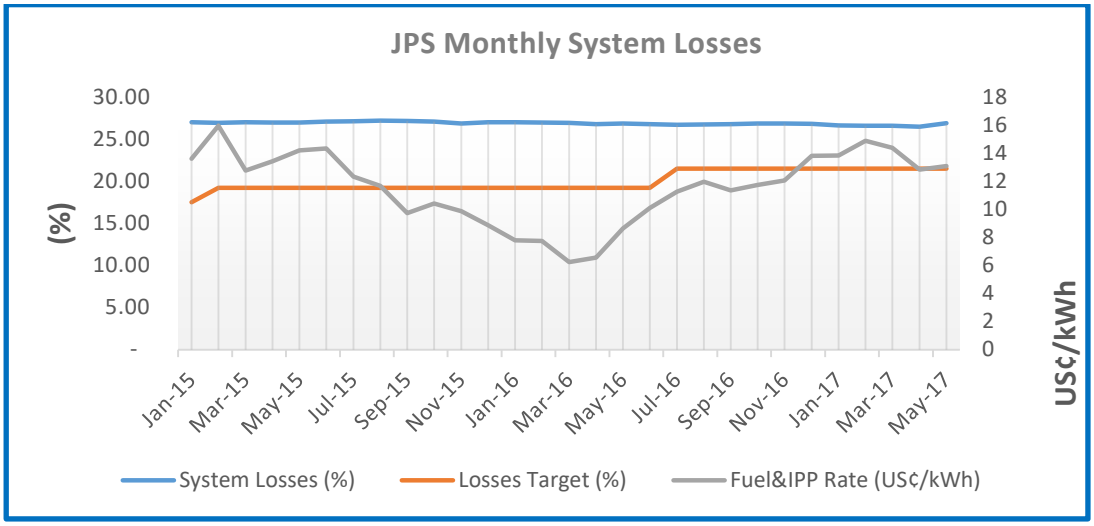
- increased the target initially from 15.8% to 19.5% for 2009/2010 and set it at 17.5% for the rest of the Rate Review period;
- established the EEIF, a US$13 million per annum fund, financed by customers to combat system losses.

This strategy did not achieve the objective as losses moved from 23.0% in 2009 to 26.6% at the end of 2014.

The determination on the 2014 -2019 rate review sought to keep the US$13 million per annum EEIF in place and the overall system losses target at 19.2%, with 8.4% and 10.8% assigned to technical and non-technical components respectively.

Figure 4.8 below shows the movement in the monthly system losses relative to the target and the monthly fuel rate over the period 2015 January to 2017 May. It is evident that despite fluctuations in the fuel price for electricity (declining at first and then climbing in the latter half of the period), system losses has remained more or less constant.

Figure 4.8: JPS' Monthly System Losses based on Net Gen and Billed Sales (2015 January – 2017 May)



The changes to the treatment of system losses introduced in the Licence eventuated a fundamental shift in the treatment of losses prior to 2016. These changes are essentially more sympathetic to JPS' position, and takes a longer term view to the loss reduction effort. The OUR takes the view that system losses are an important element in achieving the goal of reducing electricity prices and must therefore remain the focus of sustained regulatory oversight and intervention as necessary.

2016 Energy Summary

For 2016, the total net generation to the System was reported as 4,343.8 GWh. 3,183.7 GWh was produced to supply billed energy, while the remainder was accounted for by system losses. As reported by JPS, system losses at the end of 2016 December, represented 26.71% of net generation. The 2016 energy breakdown is summarized in Table 4.24 below.

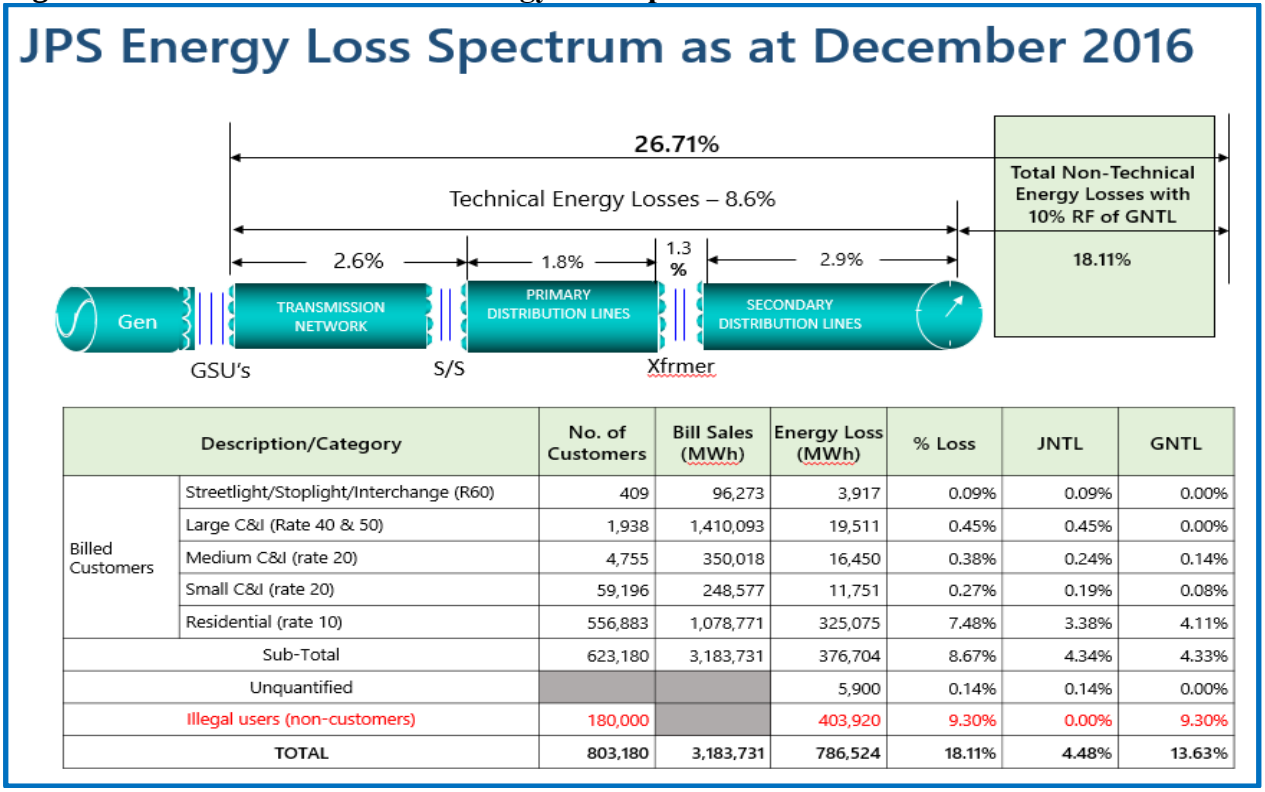
Table 4.24: Summary of JPS 2016 Energy Breakdown

	MWh	% of Net Generation
System Losses		
Technical Losses	0	8.60%
Non-Technical Losses	786,524	18.11%
Sub-total Losses	**1,160,093**	**26.71%**
Billed Energy	3,183,732	73.29%
Net Generation	**4,343,824**	**100.00%**

Source: JPS' Annual Review Submission 2017

A further break-out of the 26.71% system losses as at 2016 December, is captured in JPS' 2016 December Energy Loss Spectrum (ELS) shown in Figure 4.9 below.

Figure 4.9: JPS' December 2016 Energy Loss Spectrum



Description/Category		No. of Customers	Bill Sales (MWh)	Energy Loss (MWh)	% Loss	JNTL	GNTL
Billed Customers	Streetlight/Stoplight/Interchange (R60)	409	96,273	3,917	0.09%	0.09%	0.00%
	Large C&I (Rate 40 & 50)	1,938	1,410,093	19,511	0.45%	0.45%	0.00%
	Medium C&I (rate 20)	4,755	350,018	16,450	0.38%	0.24%	0.14%
	Small C&I (rate 20)	59,196	248,577	11,751	0.27%	0.19%	0.08%
	Residential (rate 10)	556,883	1,078,771	325,075	7.48%	3.38%	4.11%
Sub-Total		623,180	3,183,731	376,704	8.67%	4.34%	4.33%
Unquantified				5,900	0.14%	0.14%	0.00%
Illegal users (non-customers)		180,000		403,920	9.30%	0.00%	9.30%
TOTAL		**803,180**	**3,183,731**	**786,524**	**18.11%**	**4.48%**	**13.63%**

Source: JPS' Annual Review Submission 2017

Comparison of JPS Energy Loss Spectrums

A comparison of the JPS' system losses components in 2014, 2015, and 2016 is provided in Table 4.25 below.

The system losses data in Table 4.25 above shows that:

- In 2016 total system losses decreased by 0.27 percentage point to 26.71% of net generation reflecting energy losses similar to those reported for 2014;
- In 2016 net generation increased by approximately 3% over the 2015 level, which may have impacted the out-turn of the losses;
- Total TL have remained at a constant level of 8.6% of net generation from 2014 January to 2016 December. This suggests that the reported initiatives that have been undertaken to reduce these losses during the period under observation have not yielded the desired results;
- Energy losses related to C&I customers continue to be relatively high at over 1.0% of net generation each year;
- Total NTL have increased from 17.92% of net generation in 2014 January to 18.38% in 2015 December but exhibited a slight reversal in 2016 with a modest reduction to 18.11% at the end of 2016 December;

- NTL attributable to residential customers (Rate 10) have increased steadily from 4.36% of net generation in 2014 January to 7.45% at the end of 2016 December, representing a cumulative increase of approximately 71% over the period; and
- NTL attributable to illegal users (non-customers) increased from 9.85% of net generation in 2014 January to 10.11% at the end of 2014 December. However, as reported by JPS, the estimated number of illegal users remained constant at 180,000 with the same annual energy loss of 403,920 MWh per year (33,660 MWh per month) during the period. This appears to suggest that the indicated movement in the losses percentage does not reflect an actual change in energy loss in terms of MWh for the illegal users' category. These movements in the losses percentage over the period are essentially due to the effect of variations in annual net generation.

Table 4.25: JPS 2014, 2015 and 2016 Energy Loss Spectrum

Comparison of JPS' 2014, 2015 and 2016 Energy Losses Spectrum					
Loss Category	**Components**	**2014 January**	**2014 December**	**2015 December**	**2016 December**
TECHNICAL LOSSES	Transmission Network	2.60%	2.60%	2.60%	2.60%
	Primary Distribution	1.80%	1.80%	1.80%	1.80%
	Distribution	1.30%	1.30%	1.30%	1.30%
	Secondary	2.90%	2.90%	2.90%	2.90%
	Total Technical Losses	**8.60%**	**8.60%**	**8.60%**	**8.60%**
NON-TECHNICAL LOSSES	Streetlight/Stoplight	0.20%	0.20%	0.09%	0.09%
	Large C&I (Rate	1.19%	0.75%	0.45%	0.45%
	Medium C&I (rate 20)	0.45%	0.29%	0.31%	0.38%
	Small C&I (rate 20)	0.31%	0.33%	0.32%	0.27%
	Residential (rate 10)	4.36%	6.10%	7.08%	7.45%
	Sub-Total	**6.51%**	**7.67%**	**8.25%**	**8.67%**
	Internal	1.56%	0.27%	0.53%	0.14%
	Illegal Users (non-	**9.85%**	**10.11%**	**9.60%**	**9.30%**
	Total Non-Technical	**17.92%**	**18.05%**	**18.38%**	**18.11%**
TOTAL		**26.52%**	**26.65%**	**26.98%**	**26.71%**
Net Gen		**4,141,643**	**4,112,698**	**4,209,322**	**4,343,812**

Analysis of JPS' 2016 Monthly System Loss Components

The breakdown for each category of the system losses for each month in 2016 is provided in Table 4.26 below.

With respect to the monthly reporting of system losses, the OUR notes that JPS has not submitted ELS for the months of 2017 January to May, despite repeated requests.

Table 4.26: JPS' 2016 Monthly System Loss Breakdown

JPS' 2016 Monthly Energy Loss Breakdown													
Loss Category	**Components**	**2016 Jan**	**2016 Feb**	**2016 Mar**	**2016 Apr**	**2016 May**	**2016 Jun**	**2016 Jul**	**2016 Aug**	**2016 Sep**	**2016 Oct**	**2016 Nov**	**2016 Dec**
TECHNICAL LOSSES	Transmission Network	2.60%	2.60%	2.60%	2.60%	2.60%	2.60%	2.60%	2.60%	2.60%	2.60%	2.60%	2.60%
	Primary Distribution Lines	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%
	Distribution Transformers	1.30%	1.30%	1.30%	1.30%	1.30%	1.30%	1.30%	1.30%	1.30%	1.30%	1.30%	1.30%
	Secondary Distribution Lines	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%
	Total Technical Losses	**8.60%**	**8.60%**	**8.60%**	**8.60%**	**8.60%**	**8.60%**	**8.60%**	**8.60%**	**8.60%**	**8.60%**	**8.60%**	**8.60%**
NON-TECHNICAL LOSSES	Streetlight/ Stoplight (RT 60)	0.19%	0.19%	0.19%	0.19%	0.19%	0.19%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
	Large C&I (Rate 40&50)	0.76%	0.76%	0.76%	0.76%	0.77%	0.77%	0.45%	0.45%	0.45%	0.45%	0.45%	0.45%
	Medium C&I (Rate 20)	0.31%	0.33%	0.33%	0.34%	0.35%	0.35%	0.36%	0.37%	0.36%	0.36%	0.36%	0.38%
	Small C&I (Rate 20)	0.31%	0.31%	0.31%	0.29%	0.28%	0.28%	0.27%	0.24%	0.25%	0.27%	0.27%	0.27%
	Residential (Rate 10)	5.81%	5.87%	5.81%	5.82%	5.83%	5.85%	7.45%	7.40%	7.43%	7.46%	7.47%	7.48%
	Sub-Total	**7.38%**	**7.46%**	**7.40%**	**7.40%**	**7.42%**	**7.44%**	**8.62%**	**8.55%**	**8.58%**	**8.63%**	**8.64%**	**8.67%**
	Internal/ Unquantified	**1.47%**	**1.43%**	**1.43%**	**1.32%**	**1.43%**	**1.34%**	**0.12%**	**0.27%**	**0.36%**	**0.29%**	**0.21%**	**0.14%**
	Illegal Users (non-customers)	**9.55%**	**9.50%**	**9.48%**	**9.44%**	**9.40%**	**9.38%**	**9.34%**	**9.33%**	**9.33%**	**9.33%**	**9.32%**	**9.30%**
	Total Non-Technical Losses	**18.40%**	**18.39%**	**18.31%**	**18.16%**	**18.25%**	**18.16%**	**18.08%**	**18.15%**	**18.27%**	**18.25%**	**18.17%**	**18.11%**
TOTAL		**27.00%**	**26.99%**	**26.91%**	**26.76%**	**26.85%**	**26.76%**	**26.68%**	**26.75%**	**26.87%**	**26.85%**	**26.77%**	**26.71%**

The 2016 monthly system losses data in Table 4.26 above shows that:

- All the components of TL have remained unchanged for each month in 2016. This clearly indicates that the efforts that are being employed to reduce technical losses over the stated period are proving ineffective;
- NTL due to Rate 10 customers were consistently in the range of 5.81% to 5.87% of net generation between 2016 January and June. However, there was a sudden increase from 5.85% in 2016 June to 7.45% in 2016 July, representing an effective change of 1.60 percentage point of net generation during the period. This translates to an effective increase in actual average energy losses of 5,876 MWh for this non-technical losses category at that juncture. The system losses data also revealed that there was no significant increase in the number of residential customers between 2016 June and July. Therefore, the reason for such a significant step change in energy losses for this losses category in such a relatively short timeframe is questionable;
- NTL attributable to illegal users (non-customers) marginally decreased from 9.55% of net generation in 2016 January to 9.30% at the end of December. However, the estimated number of "illegal users" remained constant at 180,000 with the same monthly energy loss of 33,660 MWh per month (403,920 MWh per year) during the period. This implies that the indicated reduction of 0.25% does not reflect any actual reduction in energy losses in terms of MWh. Essentially, this reduction in losses

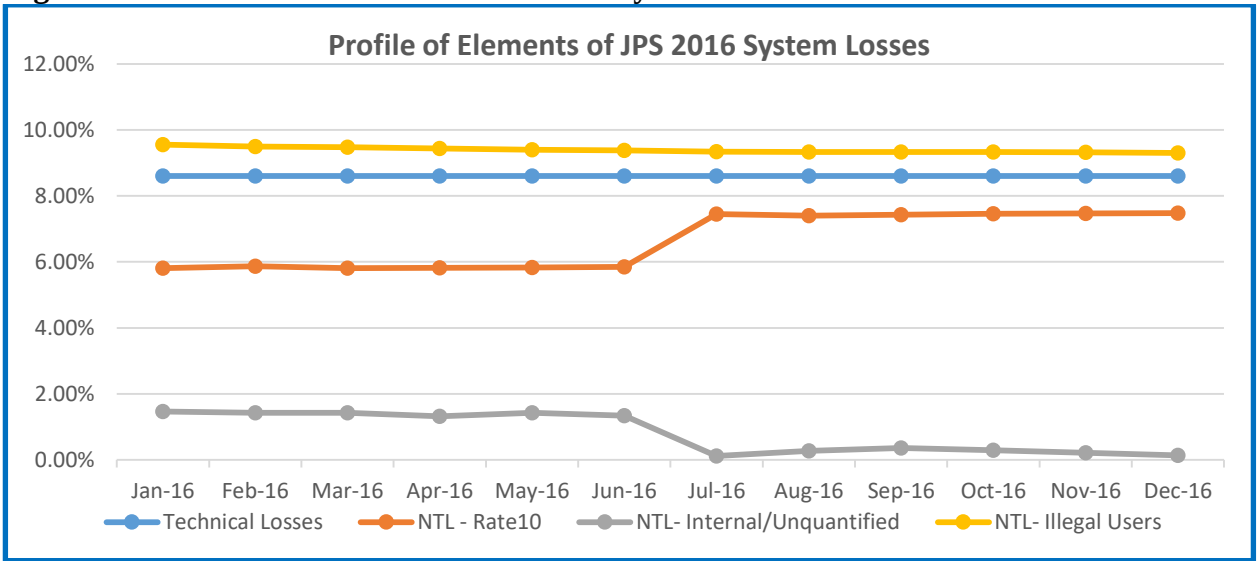
percentage over the period is actually due to the effect of progressive increases in net generation and not because of any loss reduction intervention by JPS;

- Since 2016 January, JPS has referred to one of the components of its NTL as "Unquantified" which it previously defined as "Internal Bleeds/Unquantified". It is therefore not clear how internal losses are being accounted for. Internal losses usually stem from inefficiencies in the utility's internal operations, such as: meter reading errors, estimation errors, metering inaccuracies (programming, installation, etc.), defective meters, human errors driven by business process weaknesses, etc. However, there are indications that these losses still exist in JPS' operations. Not clearly accounting for these losses creates challenges in establishing the system losses targets;
- NTL defined as "Unquantified" moved down from 1.47% of net generation in 2016 January to 0.14% at the end of 2016 December. However, there was a sudden decrease from 1.34% in 2016 June to 0.12% in 2016 July, representing a change of 1.22% of net generation. This translates to an effective decrease of 4,394 MWh (on average) in actual energy losses defined as "Unquantified". The indicated increase in NTL due to the Rate 10 customer class and the simultaneous decrease in energy losses defined as "Unquantified" between 2016 June and July, infers a counter balancing effect with no material change to the total NTL. Notwithstanding, it should be noted that the sudden shift in energy losses for these two NTL categories identified in the ELS actually coincided with the implementation of the OUR's 2016 Annual Tariff Adjustment Determination in 2016 July;
- All other categories of NTL remained fairly constant in the June-July timeframe and there were no reports of any major loss reduction interventions by JPS to justify such a significant decrease in energy losses defined as "Unquantified" in a single month. Also, it was unlikely that an increase in NTL equivalent to 1.6% of net generation due to Rate 10 customers could be realized in such a short timeframe. This situation therefore raises legitimate concerns as to whether there are deliberate attempts to reposition the losses in the ELS, to target a certain level of allocation; and

- The fuel rate calculation submissions to the OUR for each month during the period 2016 July to December showed a constant level of system losses of 26.91% of net generation for the respective months. This was found to be inconsistent with the ELS submitted to the OUR for each of the specified months within the stated period. This requires explanation or alteration by JPS.

The movement in components of JPS' system losses in 2016 is illustrated in Figure 4.10 below**.**

Figure 4.10: Profile of Elements of JPS 2016 System Losses



OUR's Comments:

Based on the OUR's analysis of the regulatory reports submitted by JPS, there is no clear indication that these components of the TL are being measured, calculated and evaluated on a systematic basis and in accordance with prudent utility practice.

JPS Technical Losses Proposals

In JPS' Annual Review Submission 2017, the company proposed a TL target of 8.4% of net generation, which would be applied at the 2018/2019 tariff adjustment date. Notably, this was the same TL target that was proposed by JPS in its 2016 annual adjustment filing.

JPS Proposed Technical Losses Reduction Initiatives for the 2017/18 Tariff Adjustment Period

JPS posits that its existing technical energy loss is estimated at 8.6% of net generation, which has been reviewed and validated by international consultants, KEMA DNV ("KEMA"), and benchmarked as within acceptable levels against several utilities of similar geographical territory and network characteristics.

OUR's Comments:

JPS has made reference to KEMA's 2013 review and validation of its technical losses (TL) analysis. Since that time, there has been no improvement in JPS' TL as reflected the 2014, 2015 and 2016 energy loss spectrum (ELS), despite claims by the company that it has expended significant resources to address these losses during the indicated time period. Notably, JPS in its 2014-2019 rate case application in 2014, indicated that the estimated level of 8.6% for TL in 2014 was actually due to an alteration to the measurement approach, which resulted in a downward adjustment in TL from 10.0% to 8.6% of net generation, as was represented in JPS' 2014 January ELS. For emphasis, this change in the level of JPS' technical losses since 2014 was not due to any loss reduction initiative implemented by JPS but a change in how JPS accounted for the variable.

JPS asserts that it continues to work diligently towards its optimal TL level through several economically feasible initiatives. These include: (1) primary distribution feeder power factor correction, (2) primary distribution feeder phase balancing and, (3) voltage standardization program (VSP).

According to JPS, these projects include, but are not limited to: (1) upgrading of over 75% of the primary distribution network voltages from 12kV and 13.8kV to 24kV, (2) re-conductoring of distribution lines, (3) reconfiguration of primary distribution feeders, (4) rehabilitation of the secondary distribution network, (5) installation of substation bulk capacitor banks and (6) the replacement of distribution transformers (pole and pad mounted) with low loss transformers. JPS' proposed TL reduction projects are described as follows:

Power Factor (PF) Correction

This is aimed at maintaining a minimum of 0.95 PF for each feeder during peak and off peak load conditions. The PF of 0.95 is the optimal point at which the greatest return on investment is achieved. This is achieved by the use and application of both switched and fixed pole-mounted capacitor banks to address the peak and off peak VAR demands, respectively.

Feeder Phase Balancing

Feeder phase balancing is essential in maintaining good voltage quality and reliability of supply by ensuring the neutral current for the 3-phase system is less than 10% of the feeder average current. Phase imbalance above 20% translates into energy loss due to increased line current and voltage drop, it also makes economic sense to prioritize and improve these to below 10%. According to JPS, the focus was on identifying feeders with phase imbalances above 20% to economically improve and maintain them within acceptable phase balanced levels. JPS indicated that for 2017-2021, emphasis will be placed on the continuation of the activities in 2016 which will be incorporated as part of its routine operation of maintaining the phase imbalance of the corrected feeders within acceptable levels.

Voltage Standardization Program (VSP)

JPS indicated that in 2016 it resumed the 24kV voltage upgrade program where three feeders were targeted and converted to 24 kV. The upgraded feeders are Greenwood Substation 110 feeder (100% completed), Martha Brae Substation 110 feeder and Duncan's Substation 110 feeder (95% and 60% completed respectively). JPS indicated that the "Voltage Standardization Programme" is aimed at standardizing the medium voltage network across the island at 24 kV, to improve the TL on these feeders. For 2017, JPS indicated that the following four (4) feeders are targeted for upgrade:

1. Hope Substation 510
2. Roaring River Substations 210, 310 and 410 feeders.

OUR's Comments:

JPS' TL have remained static at 8.6% of net generation for nearly four (4) years. This is an indication that no meaningful actions has been taken or the actions taken by the company to address these losses are ineffective. It is perhaps instructive that no impact in terms of TL reduction was quantified by JPS for the proposed TL reduction initiatives to be deployed in 2017. Also, there is no evidence that JPS' capital expenditure programme includes any serious TL reduction initiatives in 2017. This highlights a critical weakness in JPS' approach to combat these energy losses.

OUR's Evaluation of JPS' Technical Losses Proposals

At the 2014-2019 Rate Review, the JPS presented its five (5) Year Loss Reduction Plan for both TL and NTL for the period 2014 to 2018. The details of the referenced loss reduction plan is shown in Figure 4.11 below.

Figure 4.11: JPS 2014-2019 Rate Review - Five (5) Year Loss Reduction Program

Category	Initiatives	2014	2015	2016	2017	2018	Total
Illegal (Users) Non-customers	Strike Force, RAMI, CAAMI, Community Renewal Program	0.14%	0.25%	0.43%	0.43%	0.43%	1.68%
Residential	Field Audit	0.13%	0.15%	0.10%	0.10%	0.10%	0.58%
Small Commercial	Field Audit	0.07%	0.07%	0.10%	0.10%	0.10%	0.44%
Large Commercial & Industrial	Field Audit	0.24%	0.10%	0.10%	0.10%	0.10%	0.64%
Technical Energy Loss	Feeder PF & PB, S/s Capacitor Banks, Secondary Rehabilitation.	0.18%	0.23%	0.24%	0.15%	0.10%	0.90%
Targeted Feeder Energy Balance Sol.	RAMI, CAAMI, Field Audit & Aggregate meters	0.33%	0.50%	0.60%	0.70%	0.80%	2.93%
Impact on Losses		**1.09%**	**1.30%**	**1.57%**	**1.58%**	**1.63%**	**7.17%**

Source: JPS 2014-2019 Rate Case Application

According to the proposed loss reduction initiatives it was expected that technical losses would be reduced by 0.18% at the end of 2014, then 0.23% at the end of 2015 and 0.24% at the end of 2017. This would result in a cumulative reduction in TL of 0.65% of net generation by the end of 2017.

In the OUR's 2014-2019 Determination Notice, it was determined that the EEIF would be used to support the implementation of these loss reduction programmes.

Given that the OUR's 2014-2019 Determination Notice became effective in 2015 January, it was anticipated that JPS would have pushed forward its proposed 2014-2019 loss reduction plan to take effect starting 2015 instead of 2014, since the approved costs would have been incorporated in the new rates that would take effect starting 2015 March. On that basis, the expectation was that by the end of 2015, the implementation of the proposed loss reduction programmes would have resulted in a reduction of TL by approximately 0.18%. Likewise, a further 0.23% by the end of 2016. Nevertheless, no reduction in JPS' technical losses was reported for 2015, 2016 or even up to 2017 May.

Review of JPS' Loss Reduction Plan for 2016

The Annual Loss Reduction Plan for 2016, which was included in JPS' 2016 annual adjustment filing, projected an overall annual reduction in TL of 0.08% of net generation, with 0.06% to be achieved from power factor correction and 0.02% from feeder phase balancing activities. While the TL reduction of 0.08% in 2016 represented a departure from the TL reduction of 0.23% (adjusted) for 2016 to which JPS committed at the 2014-2019 Rate

Review, the OUR considered the proposed 0.08% reduction in 2016 annual adjustment filing on the basis that there was subsequent revision of the System losses strategy.

According to the 2016 plan, the estimated level of funding that was required to support the proposed loss reduction initiatives was US$ 0.70 million.

Notably, US$ 0.85 million of Capex had been posited as required to finance the proposed technical losses reduction initiatives in 2014 while US$3.1 million was posited for 2015.

The OUR in its 2014-2019 Determination Notice, determined that the EEIF could also be used to support JPS' TL reduction programmes. However, at the 2016/2017 annual tariff adjustment, the EEIF was decreased to 50% of its initial amount. While the size of the fund was reduced, no restriction was imposed on JPS regarding its use to support the TL reduction initiatives that were identified for implementation in 2016.

The specific initiatives directed to the reduction of TL and the corresponding impact for 2016 are shown in Table 4.27 below.

Table 4.27: JPS' Loss Reduction Plan for 2016

Annual Plan for 2016

	2016			Q1			Q2			Q3			Q4		
Initiatives	Qty	Impact	Budget (US$ '000)	Qty	Impact	Budget (US$ '000)	Qty	Impact	Budget (US$'000)	Qty	Impact	Budget (US$'000)	Qty	Impact	Budget (US$'000)
NON-TECHNICAL															
RAMI new installation	2000	0.03%	1,000.00	1200	0.02%	600	700	0.01%	350	100	0.00%	50	0	0.00%	0
CAAMI new installation	1000	0.03%	500	500	0.02%	250	400	0.01%	200	100	0.00%	50	0	0.00%	0
Smart Grid AMI (Residential)	20000	0.27%	5,000.00	0	0.00%	0	1000	0.01%	250	9000	0.12%	2250	10000	0.14%	2500
Advanced Automated Theft Detection Analytical Tool	1	0	280	1	0	140	1	0	140	0	0	0	0	0	0
Feeder/Sub-feeder/transformer metering	833	0.04%	500	0	0.00%	0	42	0.00%	25	375	0.02%	225	417	0.02%	250
RAMI and CAAMI Rehabilitation	0	0.08%	450		0.00%	112.50		0.03%	112.50		0.03%	112.50		0.01%	112.50
RAMI and CAAMI Reliability Improvement	6000		425	0		-	2500		177	2500		177	1000		71
Small Account Audits	75000	0.16%	150	18933	0.04%	37.87	19176	0.04%	38.35	19175	0.04%	38.35	17716	0.04%	35.43
Large Account Audits	All	0.17%	200	1966	0.04%	51.82	1975	0.04%	52.05	1990	0.04%	52.44	1658	0.04%	43.69
Community Renewal (RAMI)	4,000	0.01%	4,000.00	1087.00	0.00%	1087.00	1,387	0.00%	1,387	1,204	0.00%	1,204	322	0.00%	322
Total Non-Technical			*12,505.00*			*2,279.19*			2,731.90			4,159.29			3,334.62
TECHNICAL															
Power Factor Correction	Maintain 90% of feeders above 0.95 PF	0.06%	250		0.02%	100		0.02%	100		0.03%	50		0.00%	
Phase Balancing	Maintain 90% of feeders below 20% phase imbalance	0.02%	100		0.00%	20		0.01%	30		0.01%	50		0.00%	
Total Technical			*350*			*120*			130			100			0
Total			12,855.00			2,399.19			2,861.90			4,259.29			3,334.62

Source: JPS 2016 Annual Tariff Adjustment Filing (Page 51)

Although JPS committed to these proposals in 2016, it is unclear whether they were fully executed as planned because there is no evidence of any impact on TL during that year. Based on JPS' system losses data up to 2017 May, TL remained constant at the pre-existing level of 8.6% of net generation.

EEIF Supported Technical Losses Reduction Projects

Evidence of the inaction of JPS in addressing TL is also reflected in the EEIF reports submitted to the OUR by JPS on a quarterly basis. The reports for the four quarters in 2016 and the first quarter (Q1) of 2017 show that there was no activity for the TL reduction projects for the entire reporting period (Refer to Table 4.28 below).

Table 4.28: JPS' EEIF Loss Reduction Projects and Expenditure for 2016 - 2017

PERIOD	EEIF LOSS REDUCTION SUPPORT: BUDGET vs ACTUAL EXPENDITURE			
		TOTAL (US$'000)		
	CAPITAL EXPENDITURE	Budget	Actual	Variance
QUARTER ENDING 2016 MARCH	AMI Systems	650	69	581
	Community Renewal Program	300	-	300
	RAMI & CAAMI Development	40	-	10
	RAMI & CAAMI Maintenance	113	103-	10
	Technical Loss Reduction Projects	10		10
	Theft Resistant Distribution Network/ Meter Centres	40	-	40
	TOTAL	**1,153**	**171**	**982**
QUARTER ENDING 2016 JUNE	**CAPITAL EXPENDITURE**			
	AMI Systems	1,080	969	111
	Community Renewal Program	1,250	110	1,140
	RAMI & CAAMI Development	120	2	118
	RAMI & CAAMI Maintenance	280	153	127
	Technical Loss Reduction Projects	90	-	90
	Theft Resistant Distribution Network/ Meter Centres	195	-	195
	TOTAL CAPITAL EXPENDITURE	**3,015**	**1,234**	**1,781**
QUARTER ENDING 2016 SEPTEMBER	AMI Systems	2,370	945	1,425
	Community Renewal Program	1,150	160	990
	RAMI & CAAMI Development	40	66	(26)
	RAMI & CAAMI Maintenance	265	184	81
	Technical Loss Reduction Projects	205	-	205
	Theft Resistant Distribution Network/ Meter Centres	195	-	195
	TOTAL CAPITAL EXPENDITURE	**4,225**	**1,355**	**2,870**
QUARTER ENDING 2016 DECEMBER	AMI Systems	2,300	2,395	(95)
	Community Renewal Program	1,300	783	517
	RAMI & CAAMI Development	-		-
	RAMI & CAAMI Maintenance	217	202	15
	Technical Loss Reduction Projects	150	-	150
	Theft Resistant Distribution Network/ Meter Centres	70	-	70
	TOTAL CAPITAL EXPENDITURE	**4,037**	**3,381**	**656**

QUARTER ENDING 2017 MARCH	AMI Systems	**1,700**	**760**	**940**
	Community Renewal Program	**825**	**116**	**709**
	RAMI & CAAMI Maintenance	**150**	**135**	**15**
	Technical Loss Reduction Projects	10	-	10
	Theft Resistant Distribution Network/ Meter Centres	**130**	**9**	**122**
	TOTAL CAPITAL EXPENDITURE	**2,815**	**1,019**	**1,796**

Source: JPS' 2016 EEIF Quarterly Reports to OUR

Optimal Reduction of Technical Losses

Optimization of TL in JPS' T&D network is an engineering issue, and can be simulated and calculated using power systems planning and modelling tools (computer software models). Improvements in information technology and data acquisition systems have also provided enhanced capabilities for the calculation and verification of TL. Since TL are valued at generation costs, they represent an economic loss for the country, and their optimization should be performed from a country's perspective.

OUR's Measurement of Transmission System Losses

Power System simulations, including load flow analyses, recently carried out by the OUR to evaluate operational aspects of JPS' System under the existing configuration, indicated transmission system losses in the range of **2.0% - 2.2%** of net generation, compared to the 2.6% being reported by JPS. These simulation results were considered by the OUR in establishing JPS' TL target. Further, the OUR will continue to utilize these simulations and other scientific approaches to evaluate aspects of JPS' TL going forward.

Projected Reduction in Technical Losses for 2017

JPS' Annual Review Submission 2017 did not include a revised TL reduction target for 2017. Therefore, the OUR has considered the projection of 0.15% given in JPS' 2014-2019 rate case application.

OUR's Determination on JPS' Technical Losses Target

Following a review and evaluation of JPS' TL proposal included in its Annual Review Submission 2017, the Office in making its determination took into consideration, among other things, the following factors:

- The level of TL reduction that was expected in 2016
- JPS' TL reduction projection for 2017
- The results of the OUR's simulation of JPS' transmission system
- JPS' approach towards addressing TL since 2014.

Accordingly, the OUR determined that JPS' TL target, which is to be applied in the annual revenue adjustment mechanism at the 2018/2019 annual review, shall be reduced from 8.2% to 8.0% of net generation. This is set out in Table 4.29 below.

Table 4.29: JPS' TL Target Determined by OUR

OUR's Determination - JPS' Technical Losses Target for 2018/19				
	[2017/2018]	[2017/2018]	[2018/2019]	[2018/2019]
ASPECT OF SYSTEM LOSSES	JPS PROPOSED TARGET (% of Net Generation)	OUR's APPROVED TARGET (% of Net Generation)	JPS PROPOSED TARGET (% of Net Generation)	OUR APPROVED TARGET (% of Net Generation)
JPS TECHNICAL LOSSES (TL)	8.4%	8.2%	**8.4%**	**8.0%**

DETERMINATION 9

Technical Losses

The Technical Losses (TL) Target to be applied by JPS at the 2018/2019 Annual Review, shall be 8.0% of net generation.

Non-Technical Losses Review

Description of JPS' Non-Technical Losses (NTL)

According to JPS' system losses data, total NTL are due to energy losses which occur in three main areas:

- NTL caused by billed customers (RT10, RT20, RT40&50, and RT60)
- NTL that are Internal to JPS' operations and "Unquantified" energy losses
- NTL due to illegal users (non-customers)

According to Schedule 3, paragraph 38 of the Licence, the total NTL should be divided into two categories:

- The aspect of NTL that are within the control of JPS - designated by JPS as "JNTL"
- The aspect of NTL that are not totally within the control of JPS – designated by JPS as general non-technical losses "GNTL"

Table 4.30: JPS' 2016 Non-Technical Losses Breakdown

Description/Category		No. of Customers	Bill Sales (MWh)	Energy Loss (MWh)	% Loss	JNTL	GNTL
Billed Customers	Streetlight/Stoplight/Interchange (R60)	409	96,273	3,917	0.09%	0.09%	0.00%
	Large C&I (Rate 40 & 50)	1,938	1,410,093	19,511	0.45%	0.45%	0.00%
	Medium C&I (rate 20)	4,755	350,018	16,450	0.38%	0.24%	0.14%
	Small C&I (rate 20)	59,196	248,577	11,751	0.27%	0.19%	0.08%
	Residential (rate 10)	556,883	1,078,771	325,075	7.48%	3.38%	4.11%
Sub-Total		623,180	3,183,731	376,704	8.67%	4.34%	4.33%
Unquantified				5,900	0.14%	0.14%	0.00%
Illegal users (non-customers)		180,000		403,920	9.30%	0.00%	9.30%
TOTAL		803,180	3,183,731	786,524	18.11%	4.48%	13.63%

Source: JPS' Annual Review Submission 2017

Based on JPS' 2016 ELS, total NTL was reported as 18.11% of net generation with JPS apportioning 4.48% and 13.63% to JNTL and GNTL respectively. Refer to Table 4.30 above.

JPS' NTL Proposals

In its Annual Review Submission 2017, JPS proposed that the NTL targets that should be set by the OUR for the 2018/2019 annual tariff adjustment, are:

- JNTL = 2.5%
- GNTL = 14 %.

JPS indicated that the proposed NTL targets were derived on the basis of the losses spectrum shown in Table 4.31 below.

Table 4.31: Losses Spectrum used for setting JPS' Proposed NTL Targets

Description	Customers	Billed Energy (MWh)	Energy Loss (MWh)	Energy Loss %	JNTL %	GNTL %
Billed Customers						
Streetlight, Stoplight, Interchange (RT60)	409	96,273	3,917	0.09%	0.09%	0.00%
Large Commercial (RT40 & 50)	1,938	1,410,093	19,511	0.45%	0.45%	0.00%
Medium Commercial (RT20)	4,755	350,018	16,450	0.38%	0.27%	0.11%
Small Commercial (RT20)	59,196	248,577	11,751	0.27%	0.05%	0.22%
Residential (RT10)	556,883	1,078,771	325,075	7.48%	1.72%	5.76%
Subtotal	**623,181**	**3,183,732**	**376,704**	**8.67%**	**2.58%**	**6.09%**
Internal Losses	N/A	N/A	5,900	0.14%	0.14%	0.00%
Illegal Consumers	180,000	N/A	403,920	9.30%	0.00%	9.30%
Grand Total	**803,181**	**3,183,732**	**1,539,932**	**35.45%**	**2.72%**	**15.39%**

Source: JPS' Annual Review Submission 2017 (Page 41)

OUR's Comment

Based on the information provided, JPS seems to be saying that it is prepared to only take full responsibility for 15% of the total NTL.

JPS also indicated that the losses spectrum referenced in Table 4.31 was derived by allocating losses to JNTL and GNTL as shown in Table 4.32.

Table 4.32: JPS Proposed Allocation of JNTL and GNTL

Category	JNTL %	GNTL %
Streetlight, Stoplight, Interchange (RT60)	100%	0%
Large Commercial (RT40&50)	100%	0%
Medium Commercial (RT20)	58%	42%
Small Commercial (RT20)	20%	80%
Residential (RT10)	23%	77%
Internal Inefficiencies	100%	0%
Illegal Consumers	0%	100%

Source: JPS' Annual Review Submission 2017 (Page 41)

According to JPS' reasoning under section 1.2.6 (page 27) of its Annual Review Submission 2017, the company first determined the losses spectrum by allocating the losses to the various customer classes. Then for each rate class, JPS considered the nature and the root cause of the losses and the extent to which the company has control over the different causal factors, to determine the proportions that fall into the JNTL and GNTL buckets as represented in the 2016 ELS. JPS posited that it used this approach to finalise the loss spectrum and to develop its proposal for the disaggregation of system losses into JNTL (4.48%) and GNTL (13.63%) using the methodology that was included in the 2016 annual tariff adjustment filing. It is important to emphasize that this disaggregation has been utilized by JPS to derive the JNTL and GNTL for each month since the 2016 Annual Tariff Adjustment Determination which was issued in 2016 July.

Additionally, JPS proposed that the disaggregation of system losses for the purpose of computing TULos2016 should be based on the same methodology that was proposed in the 2016 annual adjustment filing and which formed the basis on which the OUR established the targets for TL, JNTL and GNTL. JPS argued that in its 2016 annual tariff adjustment filing, the apportionment of losses to various causal factors or type of loss was based on the distribution of the relative incidence of each factor identified during audits carried out in relation to loss impacting service orders. JPS indicated that except for the Rate 10 customer class, its 2016 ELS was generated using the proportions for JNTL and GNTL determined by the OUR in its 2016 Annual Tariff Adjustment Determination.

Although JPS had clearly indicated in section 1.2.6 of the its Annual Review Submission 2017 that its proposed NTL targets are on the basis of the 2016 ELS, section 1.2.6.2 (page 41) of the submission, indicates a major deviation. In section 1.2.6.2, JPS also proposed that the NTL should be based on a losses spectrum which disaggregates JNTL and GNTL as 2.72% and 15.39% respectively. (Refer to Table 4.31 above).

The methodology used by JPS to establish the distribution of the causes/irregularities associated with the NTL, to derive JNTL and GNTL, was considered by the OUR to be deficient and inadequate and therefore cannot be accepted as a prudent and reliable approach for establishing the relevant NTL targets. The OUR is also of the view that this approach should be subjected to more robust examination and research by JPS.

Accordingly, subject to the requirements of the Licence, the OUR has focused its review of JPS' NTL on the orientation and distribution of the related losses components represented in the 2016 ELS, supported by its independent technical evaluation.

OUR's Evaluation of JPS' Non-Technical Losses (NLT) Proposals

Energy Losses related to Streetlight/Stoplight/Interchange (Rate 60)

As reported in the 2016 ELS, at the end of December, JPS had a total of 409 "Rate 60" accounts with NTL accounting for 0.09% of net generation (3.92 GWh). These losses were reported to be 0.19% in 2016 January, which remained constant up to 2016 June but decreased to 0.09% since 2016 July and remained fixed for the remaining portion of 2016. However, there were no major loss reduction interventions reported by JPS in 2016 for this NTL category to substantiate a reduction of 0.10% of net generation during the year.

In contrast, in section 1.2.6 (page 38) of the Annual Review Submission 2017, JPS stated as follows:

> *"The losses assigned to this rate class have not changed since this is based on the same data as last year's submission."*

OUR's Comments:

JPS approach represents another instance of inconsistency. Whereas JPS stated that losses due to Rate 60 accounts have not changed in 2016 yet there is a reported reduction in such losses from 0.19% to 0.09% for the same year in the 2016 ELS.

In its Annual Review Submission 2017, JPS restates its strategy to deal with energy losses due to this "rate class", which was previously articulated in the 2016 annual adjustment filing. Recognizing the issues, JPS confirmed that it will take full responsibility for Rate 60 related losses.

OUR's Position on JPS' Rate 60 Losses

Despite JPS' acceptance of these losses, reported system losses data indicates that there continues to be noticeable energy leakages from this segment that are clearly within the reach of JPS. Therefore, consistent with the regulatory principles and determinations set out in the 2016 Annual Tariff Adjustment Determination, the OUR will continue to treat these losses as being totally within the ambit of JPS' control.

Consequently, in concurrence with JPS' position, energy losses related to Rate 60 accounts will NOT be factored into the relevant targets for NTL as prescribed by the Licence.

Energy Losses related to Large C&I (Rates 40 & 50) Customers

As reported in the 2016 ELS, at the end of December, a total of 1,938 large C&I (Rates 40& 50) customers were included in JPS' customer base, with contribution to NTL of 0.45% of net generation (19.5 GWh). These losses were reported to be 0.76% in 2016 January, which remained almost constant up to 2016 June but decreased to 0.45% since 2016 July and remained fixed at that level for the remaining portion of 2016. This represents a reduction of

0.31% of net generation. However, the contributing factors to such change were not identified by JPS.

In the Annual Review Submission 2017, JPS indicates that the distribution of energy losses related to Rate 40 & 50 customers is based on data it obtained from regular audits and adjustments performed on these accounts. From the data obtained, JPS is claiming that the reported energy losses attributed to these rate classes were mainly caused by: defective metering, defective wiring, burnt meter, single phasing, tampering, electronic tampering, and idle service.

OUR's Comments:

From a technical standpoint, the claim that such significant portion of these losses related to Rates 40 & 50 customers is being caused by "single phasing" is highly questionable. Moreover, this notion of designated "single phasing" conditions, which JPS purports is occurring on predominantly three-phase electricity supplies needs proper engineering explanation and substantiation from JPS.

A comparison of the distribution of the modes of energy losses related to Rate 40 & 50 customers in 2015 and 2016 is shown in Table 4.33 below. JPS noted that for 2016, the relative proportions were derived from weights, which are the product of the relative incident rate and the average recovery for each mode of energy losses.

Table 4.33: Distribution of Energy Losses attributed to Rate 40 & 50 Customers

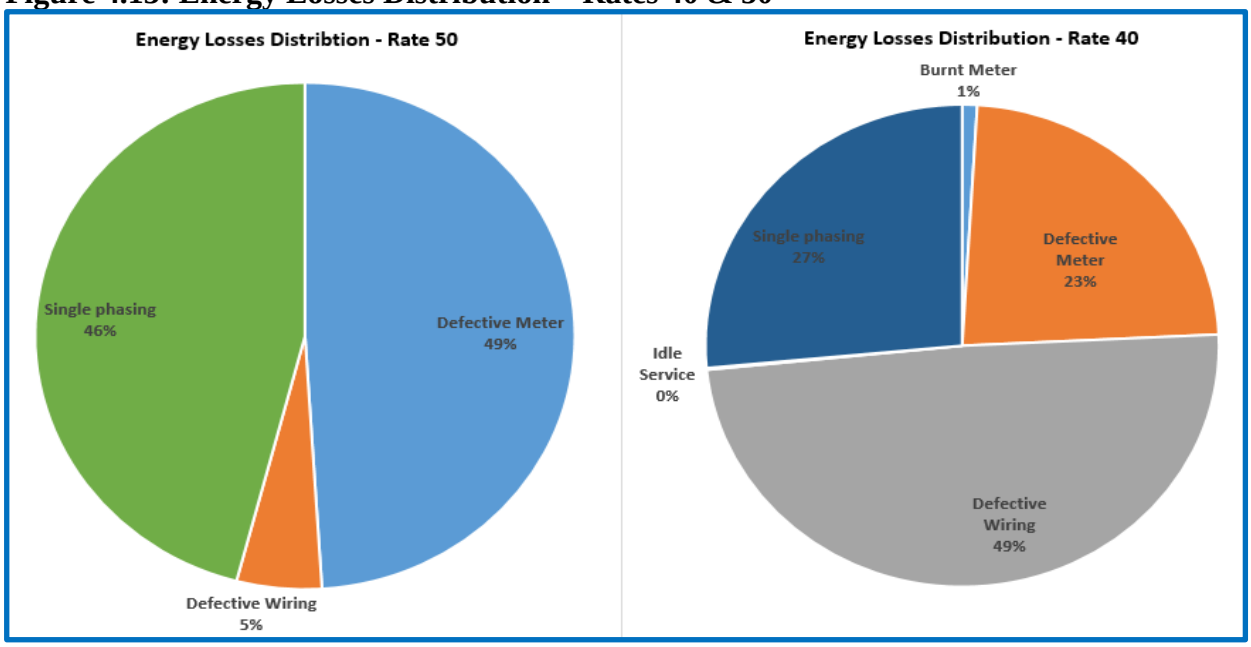
Rates 40 & 50 - Energy Losses Distribution				
	RATE 40		RATE 50	
Mode of Losses	2015 Distribution	2016 Distribution	2015 Distribution	2016 Distribution
Burnt Meter		0.94%		
Defective Meter/Metering	72.0%	23.32%	50.0%	49.0%
Defective Wiring/Incorrect Meter Configuration	15.0%	49.15%	13.0%	5.09%
Single Phasing	-	26.47%	-	45.91%
Tampering	5.0%	-	25.0%	-
Electronic Tampering	8.0%	-		
Idle Service	-	0.12%		
Equipment Damage			12.0%	-
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source data: JPS' Annual Review Submission 2017

The comparison as shown in Table 4.33 above reveals that there are significant variations in the distribution and causation factors applied to these losses. This raises concerns as to the consistency and appropriateness of samples and robustness & reliability of the methodology employed by JPS to evaluate these NTL.

The distribution of the energy losses related to Rate 40 and Rate 50 customers, given by JPS, is shown in Figure 4.13 below.

Figure 4.13: Energy Losses Distribution – Rates 40 & 50



According to JPS, Large C&I (Rates 40&50) customers represent approximately 0.3% of its total customer base and accounted for 44% of its billed energy sales in 2016. This means that a single incident of energy loss from any of these customers could have significant impact on the company's revenues. Given these factors, JPS should therefore be sufficiently incentivized to ensure that energy losses in this category are restricted to zero on a sustained basis.

In this regard, JPS should rigorously seek to identify all the possible sources of losses in the pertinent rate class, correct them and recover from the loss events as quickly as possible given the potential for significant losses due to the high usage patterns of these customers.

In the Annual Review Submission 2017, JPS affirms that during 2016, there was little evidence to suggest that these losses are due to the Rates 40 & 50 customers interfering with the company's energy meter. Consequently, JPS agrees to allocate 100% of these losses to that within JPS' control (JNTL). The OUR welcomes JPS' convergence on the regulatory treatment of this element of NTL, which is consistent with the OUR's principles and determinations set out in the 2016 Annual Tariff Adjustment Determination. Notably, this approach has been effected by the OUR since 2014, and will continue to be applied going forward.

<u>OUR's Position on JPS' Rates 40 & 50 Losses</u>

Despite JPS' improved position on the losses in the Rates 40 & 50 classes, the OUR still maintains that their current level on a MWh basis is unacceptable. The OUR therefore urges JPS to take the necessary actions to eliminate these losses on a sustained basis with the

anticipation of commensurate financial benefits. The OUR is also of the view that the losses in these rate classes can be swiftly diminished to zero based on the following factors:

- The main sources of energy losses related to Rates 40 & 50 accounts have been identified by JPS as shown in Tables 4.33 and Figure 4.13 above. As such, there should be relative ease in formulating an effective strategy to address them;
- Most, if not all, of the modalities of losses identified are related to metering or service connection defects which are directly within JPS' control;
- The number of customers/meters in these rate classes are relatively small compared to JPS' total customer base, which should not impose any insurmountable challenges to the company in monitoring and auditing the accounts on an ongoing basis;
- According to JPS, all of its Rates 40 & 50 accounts have full AMI capability and coverage, including real-time monitoring and theft detection functionalities. These features can effectively increase JPS' capacity to monitor these accounts;
- The distribution of the energy losses related to these rate classes indicates that the company is fully aware of all the elements of these losses or has the capability to immediately detect the irregularities when they occur, and therefore should seek to account for these energy leakages and recover associated costs as applicable;
- The sources of the energy losses in these rate classes suggest that the cost of the losses can be recovered by means of adjustments in accordance with the relevant "Back Billing Policy" or other means open to JPS for redress.
- JPS is required under its Licence to test 50% of its Rates 40 and 50 meters annually (Refer to Figure 4.14 below). However, JPS has indicated that it has exceeded this requirement by investigating 100% of Rates 40 and 50 accounts annually. This can also provide reasonable reinforcement to the company's efforts in reducing these losses.

Figure 4.14: Licence Requirement for JPS to Test Rates 40 & 50 Meters

SCHEDULE 2
OVERALL STANDARDS

CODE	STANDARD	UNITS	TARGETS JULY 2014 – MAY 2019
EOS7 (a)	Frequency of meter testing	Percentage of rates 40 and 50 meters tested for accuracy annually	50%
EOS7 (b)	Frequency of meter testing	Percentage of other rate categories of customer meters tested for accuracy annually	7.5%

Source: JPS Electricity Licence, 2016 (Schedule 2)

Having regard to the issues and considerations surrounding this element of NTL, the OUR, consistent with its previous determinations, concurs with JPS that the company shall have 100% responsibility for energy losses related to Large C&I (Rates 40&50) customers. That is, they shall NOT form part of the relevant NTL losses target prescribed by the Licence.

Energy Losses related to Medium C&I (Rate 20) Customers

As reported in the 2016 ELS, at the end of 2016 December, a total of 4,755 Medium C&I (Rate 20) customers were included in JPS' customer base with contribution to NTL of 0.38%

of net generation (16.45 GWh). In contrast to the 2016 loss profile of the Rates 40&50 accounts, these losses exhibited a steady increase from 0.31% of net generation in 2016 January to 0.38% at the end the year.

In the submission, JPS claims that the reported energy losses attributed to Medium C&I customers in 2016 were mainly caused by: burnt meter, defective metering, defective wiring, bypass at/before pothead, bypass within meter, idle service and single phasing.

A comparison of the distribution of the modes of energy losses related to Rate 20 customers in 2015 and 2016 is shown in Table 4.34 below. JPS noted that for 2016, the relative proportions were derived from weights, which are the product of the relative incident rate and the average recovery for each mode of energy losses.

Table 4.34: Distribution of Energy Losses attributed to Medium C&I (Rate 20) Customers

Medium C&I (Rate 20) - Energy Losses Distribution		
Mode of Losses	**2015 Distribution**	**2016 Distribution**
Burnt Meter	-	5.12%
Defective Meter/Metering	25.0%	34.51%
Defective Wiring/Incorrect Meter Configuration	3.0%	0.22%
Single Phasing	-	18.25%
Tampering	27.0%	-
Electronic Tampering	4.0%	-
Idle Service	-	0.15%
Bypass, Bypass at/before Pothead	4.0%	12.49%
Bypass within Meter	-	29.26%
Line Tap	37%	-
TOTAL	**100.0%**	**100.0%**

Source data: Annual Review Submission 2017

Similar to the Rates 40 & 50 analysis, this comparison again revealed that there are significant variations in the distribution and causation factors applied to losses in this class. This also raises concerns as to the consistency and appropriateness of samples and robustness & reliability of the methodology employed by JPS to evaluate these NTL.

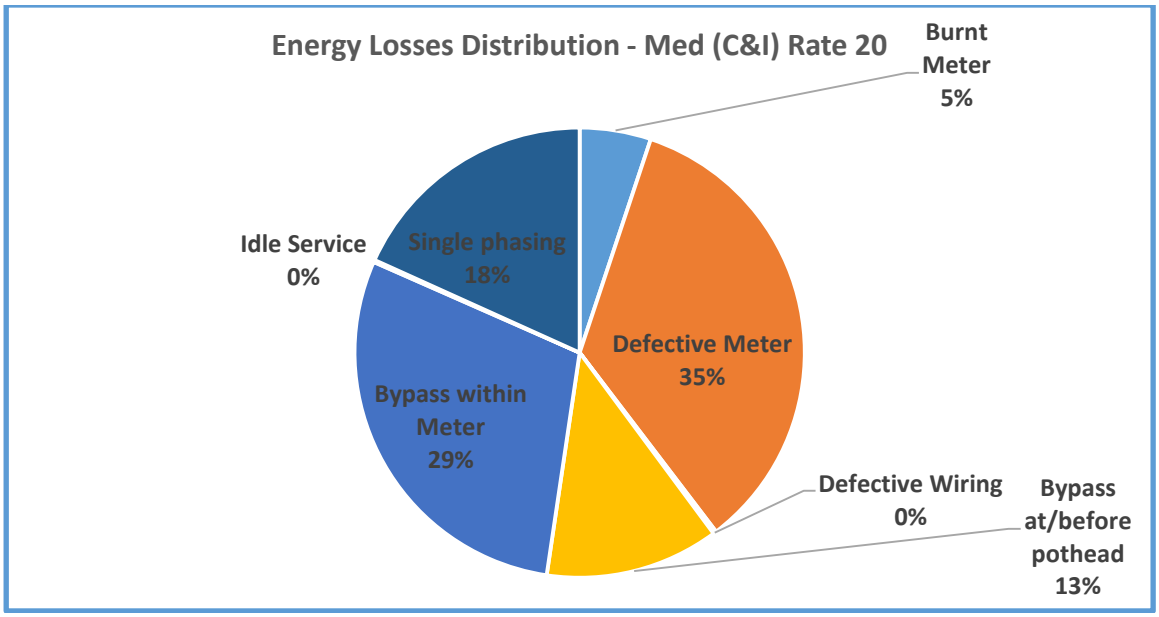
The distribution of the energy losses related to Medium C&I (Rate 20) customers, given by JPS, is shown in Figure 4.15 below.

In the Annual Review Submission 2017, JPS indicates that there are just over 3,000 AMI meters installed, giving an AMI penetration of over 60%. This is inconsistent with the status of JPS' AMI smart metering presented in section 1.7.1.3 (page 49) of JPS' 2015 annual tariff adjustment filing, which states as follows:

> *"As part of JPS' routine operation 100% of rate 40 and 50 customers' metering facilities are investigated annually. In addition, a further 4,000 rate 20 customers utilizing greater than 3MWh per month are now equipped with AMI smart meters. This represents approximately 6,000 customers or 1% of JPS' customer base. This category of customers is referred to as our Priority Industrial and Commercial (PIC)*

customers and account for approximately 50% of sales. JPS continues to perform 100% audit of all 1,920 Rate 40 and 50 accounts and plans to audit an additional 4,000 Rate 20 accounts, with monthly consumption greater than 3MWh annually."

Figure 4.15: Energy Losses Distribution – Medium C&I (Rate 20)



JPS argues that though the installed AMI meters aid its ability to monitor this group of customers, a significant portion of the losses are sustained from bypasses, which these meters are not equipped to detect.

OUR's Comments:

Firstly, the specific identification and description of such bypass irregularities have not been presented by JPS.

Secondly, JPS had indicated that the 6,000 AMI smart meters used for C&I customers, including Rate 20s, had full capability for theft detection, so there seems to be some level of discrepancy in the arguments presented by JPS. In any event, JPS should be aware that metering systems form an integral part of its electricity network and are recognized as assets under its direct management, monitoring and control. It is JPS' sole responsibility to ensure that the mentioned meter bypass conditions and other reported supply/connection related irregularities are detected and eliminated.

JPS reported that it conducted 8,830 service orders on 2,645 Medium C&I (Rate 20) premises during 2016. JPS also reported that it performed audits on 687 of the services (14% of the 4,755 customer) and it recovered 1.3 GWh of energy (10% of the losses) in 2016.

OUR's Comments:

While JPS claims that it has been working assiduously to address these losses, the gains reported do not appear to have impacted these losses in 2016, which according to the 2016 ELS, increased from 0.31% in 2016 January to 0.38% in 2016 December.

JPS Proposed NTL Allocation

In the Annual Review Submission 2017, JPS posits that 42% of the losses in this category is due to varying kinds of bypass methods. JPS further indicates that AMI meters have little ability to detect these types of losses and its visibility of this rate class suffers as a result.

OUR's Comments:

The OUR disagrees with JPS on the issue of AMI capacity and visibility of these accounts. According to JPS' own statements, the AMI meters used for approximately 6,000 of its C&I accounts, which includes Medium C&I (Rate 20), operate on similar platforms and are equipped with similar functionalities. Specifically, on the issue of visibility, with the "Total Meter Mapping Project" and other surveillance tools, JPS should by now have almost 100% visibility over these accounts.

JPS contends that losses incurred through meter bypassing must be allocated to customers as it represents a clear intent of the customer to defraud. Consequently, since 42% of losses is due to bypassing of the meter, JPS is proposing that JNTL for this category should be 58% of the losses sustained while GNTL should be 42%.

The OUR strongly disagrees with this position put forward by JPS. The orientation of these losses indicates that they are directly within the reach of JPS and should not be applied to the overall rate payers.

OUR's Position on JPS' Medium C&I (Rate 20) Losses

Having examined the level of the losses, the reported causation factors and relative distributions, the OUR is of the view that all the identified sources and causes are related to metering and service connection issues, some of which tend to emerge during normal system operation and service delivery. As such, these are considered to be directly within the control of JPS. The OUR also believes that these losses are not impossible to reduce or eliminate for largely the same reasons outlined for the Rate 40 & 50 category above. Given these factors, the OUR rejects JPS' proposal for a JNTL of 58% and GNTL of 42% for losses related to Medium C&I (Rate 20) customers.

Based on the OUR's review and evaluation, the Office's position is that all NTL related to Medium C&I (Rate 20) customers reported for 2016 are within the control of JPS. As such, they shall NOT form part of the relevant NTL losses target prescribed by the Licence.

Energy Losses related to Small C&I (Rate 20) Customers

This rate class represents Rate 20 accounts that consume less than 3 MWh monthly and are referred to as Small Rate 20 accounts.

As reported in the 2016 ELS, at the end of 2016 December, a total of 59,196 Small C&I (Rate 20) customers were included in JPS' customer base with contribution to NTL of 0.27% of net generation (11.75 GWh). During 2016, these losses have been fairly flat at an average monthly level of approximately 0.28% of net generation. In its Annual Review Submission 2017, JPS claimed that the reported energy losses attributed to small Rate 20 customers in 2016 were mainly caused by: burnt meter, defective metering, defective wiring, bypass at/before pothead, bypass within meter, idle service and single phasing.

A comparison of the distribution of the modes of energy losses related to Rate 20 customers in 2015 and 2016 is shown in Table 4.35 below. JPS notes that for 2016, the relative

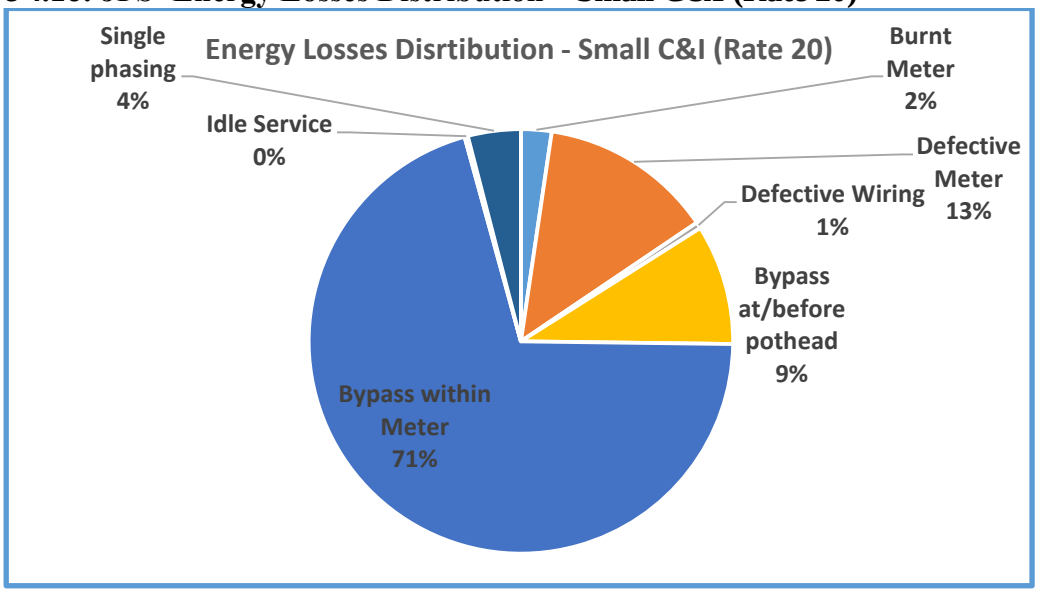
proportions were derived from weights, which are the product of the relative incident rate and the average recovery for each mode of energy losses.

Table 4.35: Distribution of Energy Losses attributed to Small C&I (Rate 20) Customers

Small C&I (Rate 20) - Energy Losses Distribution		
Mode of Losses	**2015 Distribution**	**2016 Distribution**
Burnt Meter	14.0%	2.33%
Defective Meter/Metering	-	13.22%
Defective Wiring/Incorrect Meter Configuration	2.0%	0.48%
Single Phasing	9.0%	4.03%
Direct connection within Meter	7.0%	-
Inverted Meter	2.0%	-
Idle Service	16.0%	0.25%
Bypass, Bypass at/before Pothead	9.0%	9.17%
Bypass within Meter	-	70.52%
Line Tap	26.0%	-
Open Circuit	14.0%	-
Other	1.0%	-
TOTAL	**100.0%**	**100.0%**

As with the previous cases, the comparison shown in Table 4.35 above again reveals that there are significant variations in the distribution and causation factors applied to these losses. This also raises concerns as to the consistency and appropriateness of samples as well as the robustness and reliability of the methodology employed by JPS to evaluate these NTL.

Figure 4.16: JPS' Energy Losses Distribution – Small C&I (Rate 20)



The distribution of the energy losses related to Small C&I (Rate 20) customers, given by JPS, is shown in Figure 4.16.

Based on the distribution shown, irregularities denoted as "bypass within meter" accounted for approximately 71% of the energy losses in this category. This is a crucial observation that requires further investigation.

OUR's Comments:

While the specific nature of the purported irregularities have not been identified and described by JPS, the OUR considers this reported level of interference with the metering infrastructure for revenue determination under JPS' watch to be unacceptable. Given the stringent requirements for the security and protection of these revenue metering systems by JPS, this reported level of irregularity may imply, among other things:

- inaccurate sampling and assessments; and
- poor management and monitoring of problematic accounts

Additionally, some of the identified causes that contributed to energy losses reported for the small C&I (Rate 20) category are addressed in the relevant "JPS Back Billing Policy", which sets out the appropriate regulatory procedure for redress.

The OUR underscores the important principle, that is, energy losses emanating from defects associated with a customer's owned electrical infrastructure, should be referred directly to that specific customer and not to the entire customer base as JPS appeared to have alluded to in its proposed treatment of these losses for this rate class.

In its Annual Review Submission 2017, JPS indicates that its ability to recover from this "rate class" is better than that for the residential rate class but it still faces challenges in maintaining visibility into the rate class due to low AMI penetration. The company states that audits remain its most effective tool in detecting losses for these accounts. JPS is reporting that as a result of these audits it recovered 1.3 GWh of energy (11% of the losses) in 2016. However, the reported impact of these efforts does not appear to have any noticeable effect on these losses in 2016, which according to the 2016 ELS, were fairly constant throughout the year.

With respect to the energy losses allocations for this category, JPS claims that only 20% of these losses are totally within its control while 80% of the losses were directly due to customers' actions to illegally abstract or otherwise directly under-register consumption.

OUR's Comments:

Consistent with the regulatory principles and determinations in the 2016 Annual Tariff Adjustment Determination, the OUR disagrees with JPS' position on the basis that most of the identified sources and causes of these losses involve issues related to JPS' metering facilities and electricity supply/connection issues. These issues are considered to be within the direct control of JPS during the normal operational process. Some of the issues tend to emerge over time as a consequence of continuous exposure to electrical conditions intrinsic to the delivery of electricity service to customers.

JPS also emphasizes that Smart Grid AMI and analytical initiatives will be the primary initiative to be deployed by the company in augmenting its ability to monitor this rate class. JPS notes that the deployment of these systems could provide the company with the ability to monitor consumption in fifteen (15) minute intervals, detect events indicative of losses and provide it with advanced analytical capabilities.

OUR's Comments:

While these proposed initiatives are encouraging, it should be noted that these were already committed to by JPS as far back as 2009 with the support of the EEIF. It is therefore regrettable that at this stage, JPS is only at the planning phase.

JPS' Proposed NTL Allocation

According to JPS' proposal, NTL for this losses category should be segregated into JNTL with a share of 20% and GNTL with 80%.

OUR's Position on JPS' Small C&I (Rate 20) Losses

Having examined the magnitude of these losses, the reported causation factors and relative distributions, the OUR is of the view that almost all the identified sources and causes are related to metering and service/supply connection issues, some of which tend to emerge during normal system operation and service delivery. Based on the distributions, the energy losses related to small C&I (Rate 20) customers are considered to be largely within the control of JPS. On that basis, the OUR rejects JPS' proposed allocation of JNTL and GNTL.

Based on the OUR's review and evaluation, the Office's allocation of these losses, are as follows:

- Small C&I (Rate 20) related losses determined to be within JPS' control (JNTL) - 85%
- Small C&I (Rate 20) related losses determined to be not totally within JPS' control (GNTL) – 15%

These considerations were reflected in the relevant NTL targets prescribed by the Licence.

Energy Losses related to Residential (Rate 10) Customers

As reported in the 2016 ELS, at the end of 2016 December, a total of 556,883 Rate 10 customers were included in JPS' customer base with contribution to NTL of 7.48% of net generation (325.07 GWh). As previously noted, there was a significant increase in these losses from 5.85% in 2016 June to 7.45% in July of the same year. The basis of such a significant increase in these losses, just within a one (1) month period, requires an explanation. JPS has not however presented an explanation to justify such a significant change in the losses at that juncture.

In its Annual Review Submission 2017, JPS claimed that the reported energy losses attributed to Rate 10 customers in 2016 were mainly caused by: burnt meter, defective metering, defective wiring, bypass at/before pothead, bypass within meter, idle service, single phasing and tampering. The losses data from JPS revealed that there are major commonalities in the sources and causes of energy losses in the "billed customer" categories although there are fundamental differences in their mode of operation, consumption profile and patterns and behavioural aspects.

A comparison of the distribution of the modalities of the energy losses related to Rate 10 customers in 2015 and 2016 is shown in Table 4.36 below. JPS noted that for 2016, the relative proportions were derived from weights, which are the product of the relative incident rate and the average recovery for each mode of energy losses.

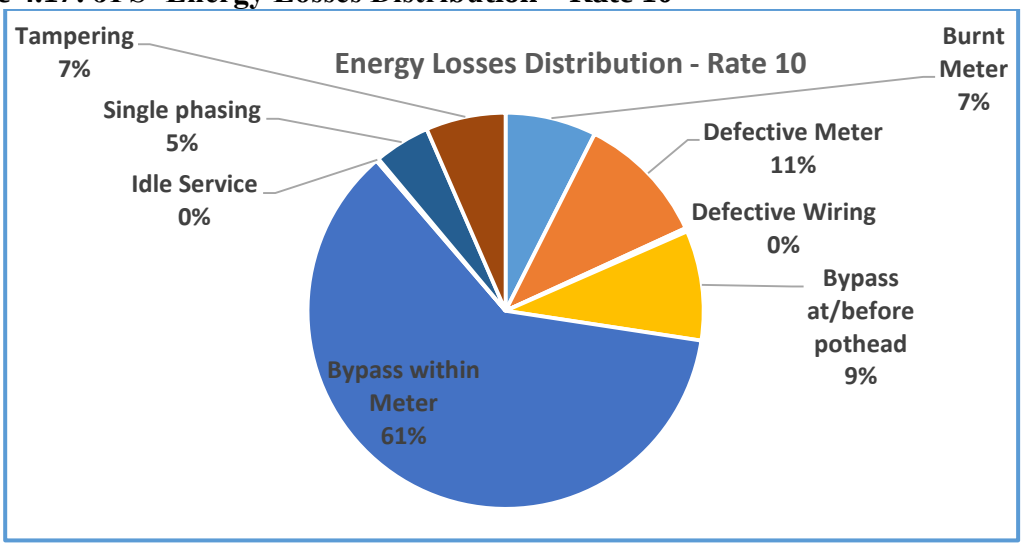
Table 4.36: Distribution of Energy Losses attributed to Rate 10 Customers

Rate 10 - Energy Losses Distribution		
Mode of Losses	**2015 Distribution**	**2016 Distribution**
Burnt Meter	14.0%	7.43%
Defective Meter/Metering	-	10.72%
Defective Wiring/Incorrect Meter Configuration	-	0.29%
Single Phasing	21.0%	4.57%
Direct connection within Meter	5.0%	-
Inverted Meter	-	-
Idle Service	2.0%	0.22%
Bypass, Bypass at/before Pothead	10.0%	8.97%
Bypass within Meter	-	61.28%
Tampering	-	6.52%
Line Tap	21.0%	-
Open Circuit	26.0%	-
Other	1.0%	-
TOTAL	**100.0%**	**100.0%**

As with the previous cases, the comparison shown in Table 4.36 above again reveals that there are significant variations in the distribution and causation factors applied to these losses. This also raises concerns as to the consistency and appropriateness of samples as well as the robustness of the methodology employed by JPS to evaluate these NTL.

JPS' distribution of the energy losses related to Rate 10 customers is illustrated in Figure 4.17 below.

Figure 4.17: JPS' Energy Losses Distribution – Rate 10



The distribution indicates that irregularities denoted as "bypass within meter" accounted for approximately 61% of the energy losses in this category. This is a crucial observation and requires further examination.

OUR's Comments:

While the specific nature of the purported irregularities has not been identified and described by JPS, the OUR considers this reported level of interference with residential revenue meters under JPS' watch to be unacceptable. Based on the stringent requirements for the security and protection of these revenue metering systems, this reported level of irregularity could also imply, among other things, the following:

- inaccurate sampling and assessments;
- very poor management and monitoring of these accounts; and
- other irregularities.

Similar to the situation with the Rate 20 category, most of the identified causes that contributed to energy losses reported for the Rate 10 category are addressed in the relevant "JPS Back Billing Policy" which sets out the appropriate regulatory procedure for redress.

In its Annual Review Submission 2017, JPS indicates that it conducted approximately 64,000 audits in 2016 specifically to detect losses, which resulted in recovery of approximately 6.3 GWh of energy (2% of the losses). However, given the extent of the losses in this category, the reported degree of impact will not be sufficient to cause any material reduction in the current energy losses.

JPS contends that despite the significant efforts expended each year in conducting audits, the large majority of customers in this "rate class" goes unaudited each year. According to JPS, this is to a large extent the result of the size of the customer base, resources involved in conducting audits, which require thorough physical inspection of the premises and metering facilities and low penetration of AMI infrastructure.

OUR's Comments:

Given the scale of the energy losses in this category, reducing losses of this type has significant up-side financial benefits to JPS. It therefore requires serious focus. JPS as the designated Single Buyer and System Operator of the Jamaica electricity system is expected under its Licence to operate the System in an efficient and reliable manner. This includes the appropriate identification and deployment of resources to address the imposing issues and challenges impacting efficient operations.

JPS indicates that it intends to continue to increase its efforts to address energy losses in this rate class by utilizing Smart Grid AMI technologies to provide real-time and near constant monitoring in the areas in which they are deployed. Specifically, JPS indicates that the company plans to continue its rollout of 100,000 AMI type revenue meters over the next five (5) years, which is expected to yield significant reduction in this losses category.

OUR's Comments:

It should be noted that similar plans to address losses in this category have been previously proposed by JPS, but their execution have not been sustained and outcomes have fallen short of expected results. Based on industry wide information, it is not impossible to curtail these losses. The potent issue here, is that, it appears that there are problems with the execution of the strategies and commitment seems to be weak.

JPS' Proposed NTL Allocation

JPS proffered that its energy losses disaggregation methodology has established customer culpability for 77% of the losses sustained from this "rate class" which occurs despite the significant effort of the company to detect and prevent these losses. Consequently, the GNTL and JNTL proposed by JPS for losses in the residential rate class are 5.76% and 1.72% respectively.

OUR's Position on JPS' Rate 10 Losses

Having examined the level of the losses, the reported causation factors and relative distributions, the OUR is of the view that almost all the identified sources and causes are related to metering and service connection issues, some of which tend to emerge during normal system operation and service delivery. Based on the distributions, the energy losses related to Rate 10 customers are considered to be largely within the control of JPS. On that basis, the OUR rejects JPS' proposed allocation of JNTL and GNTL.

Based on the OUR's review and evaluation, the Office's allocation of losses related to Rate 10 customers, are as follows:

- Rate 10 related losses determined to be within JPS' control (JNTL) - 80%
- Rate 10 related losses determined to be not totally within JPS' control (GNTL) – 20%

These considerations were reflected in the relevant NTL targets prescribed by the Licence.

Internal/Unquantified Losses

As reported in the 2016 ELS, at the end of 2016 December, JPS' "Unquantified" (Internal) losses accounted for 0.14% of net generation (5.9 GWh). As previously noted, there was a significant decrease in these losses from 1.34% in 2016 June to 0.12% in 2016 July. The basis of such significant reduction in these losses just within a one (1) month period requires explanation. JPS has not however deemed it fit to proffer an explanation to justify such a significant change in the losses at that juncture.

In its Annual Review Submission 2017, JPS explains that "internal losses" represents the company's estimate of NTL sustained due to JPS' actions or inactions as well as estimation errors for the loss spectrum model. According to JPS, the Internal Process Improvement project is an umbrella of initiatives aimed at reducing internal NTL and improving the efficiency of JPS.

Regarding the allocation of these NTL, JPS states that it accepts full responsibility for the total amount, as these losses stem from its internal operations.

OUR's Position on JPS' Internal Losses

Despite JPS' acceptance of these losses, the system losses data indicates that there are still energy leakages from this segment which can be eliminated with relative ease. Therefore, consistent with the regulatory principles and determinations set out in the 2016 Annual Tariff Adjustment Determination, the OUR will continue to treat these losses as being totally within the scope of JPS' control.

Consequently, JPS' "Unquantified" (Internal) losses" will NOT be factored into the relevant targets for NTL as prescribed by the Licence.

Non-Technical Losses due to Illegal Users (Non-Customers)

In its Annual Review Submission 2017, JPS indicates that at the end of 2016, there were an estimated 180,000 "Illegal Users" who illegally abstracted electricity from the system. According to JPS, these activities resulted in NTL losses of of 9.30% of net generation (403.92 GWh).

As previously noted, these losses decreased marginally from 9.55% in 2016 January to 9.30% at the end of 2016 December. However, this reduction in losses on a percentage basis was actually due to the effect of progressive increases in net generation and not because of any loss reduction intervention by JPS.

JPS asserts that its arguments pertaining to "Illegal Users" remains the same as was articulated in the 2016 annual tariff adjustment filing. That is, energy losses related to "Illegal Users" are mainly due to socio-economic conditions which are largely outside of the purview of the company.

The company purports that data from the 2011 Census conducted by the Statistical Institute of Jamaica (STATIN) compared to the number of customers billed through JPS' Customer Information System (CIS) indicates that over 200,000 households may be connected illegally to JPS' grid. JPS also indicates that it recognizes that a segment of the population resides in tenement housing facilities and therefore it cannot say definitively, without further information, that all 200,000 households are illegally connected. According to JPS, its conservative assessment indicates that there are approximately 180,000 illegal consumers.

JPS posits that many of the "illegal users" are associated with inner city communities and squatter areas, and that 89.9% of the NTL are due to socio-economic conditions that are outside of JPS' control.

OUR's Position on JPS' Losses caused by "Illegal Users"

With respect to NTL, the OUR maintains the view that all aspects of the system losses are largely within the control of JPS, although some elements may be more difficult to control. Nonetheless, based on the provisions of the Licence, the OUR is required to give consideration to NTL that are within the control of JPS and those deemed not to be totally within JPS' control.

The OUR examined the available system performance data and is of the opinion that approximately 80% to 90% of these losses may be due to some of the conditions highlighted by JPS.

Based on the nature and orientation of the losses attributed to "illegal users", the OUR believes that with persistence, the use of innovative technologies and appropriate policies, JPS can eliminate a significant portion of these losses, without insurmountable challenges.

Regarding the allocations of these NTL, in order to establish a representative distribution, the OUR has allotted the full amount to the aspect of NTL designated to be not totally within the control of JPS (GNTL).

With reference to the derivation of system losses adjustment factor included in the annual revenue adjustment mechanism, it should be noted that aggregate NTL losses determined to be not totally within JPS' control will be subject to a responsibility factor (RF), which is addressed below.

JPS' Allocation of Total NTL

Based on the Annual Review Submission 2017, JPS' total NTL were separated into those that are within its control (JNTL) and those not totally within its control (GNTL) is shown in Table 4.37 below.

Table 4.37: JPS' Allocation of NTL

JPS Allocation of NTL						
Loss Category	**Components**	**JPS Losses (2016 ELS)**	**JNTL 2016 ELS**	**GNTL 2016 ELS**	**JNTL JPS (Proposal)**	**GNTL JPS (Proposal)**
Non-Technical Losses (NTL)	Streetlight/Stoplight (R 60)	0.09%	0.09%	0.00%	0.09%	0.00%
	Large C&I (Rate 40&50)	0.45%	0.45%	0.00%	0.45%	0.00%
	Medium C&I (rate 20)	0.38%	0.24%	0.14%	0.27%	0.11%
	Small C&I (rate 20)	0.27%	0.19%	0.08%	0.05%	0.22%
	Residential (rate 10)	7.48%	3.38%	4.11%	1.72%	5.76%
	Internal Bleeds/Unquantified	0.14%	0.14%	0.00%	0.14%	0.00%
	Un-metered Households	9.30%	0.00%	9.30%	0.00%	9.30%
	Total Non-Technical Losses	**18.11%**	**4.48%**	**13.63%**	**2.72%**	**15.39%**

OUR's Determination on JPS' Proposed NTL Targets

OUR's Allocation of JPS' Total NTL

Based on the OUR's evaluation and analysis of the causes and distribution of the total NTL reported by JPS, the OUR derived the portion of these losses that are within JPS' control and those deemed not totally within the company's control as required by the Licence. These allocations are set out in Table 4.38 below.

As shown in Table 4.38, JNTL was derived to be approximately 7.27% of net generation while GNTL was estimated to be 10.84%.

Table 4.38: OUR's Distribution of JPS' NTL

OUR's Distribution of JPS' NTL				
Loss Category	**Components**	**JPS Losses**	**JNTL OUR**	**GNTL OUR**

		(2016 ELS)	Determined	Determined
Non-Technical Losses (NTL)	Streetlight/Stoplight (R 60)	0.09%	0.09%	0.00%
	Large C&I (Rate 40&50)	0.45%	0.45%	0.00%
	Medium C&I (rate 20)	0.38%	0.38%	0.00%
	Small C&I (rate 20)	0.27%	0.23%	0.04%
	Residential (rate 10)	7.48%	5.98%	1.50%
	Internal Bleeds/Unquantified	0.14%	0.14%	0.00%
	Un-metered Households	9.30%	0.00%	9.30%
	Total Non-Technical Losses	**18.11%**	**7.27%**	**10.84%**

Non-Technical Losses Target

Based on the OUR's allocation of JPS' total NTL in Table 4.38 above, it follows that for the JNTL aspect, JPS would be required to absorb annual NTL representing 7.27% of net generation. This would effectively translate to a JNTL target of 0.0% of net generation. However, taking into consideration, certain challenges faced by JPS in addressing losses related to some of the categories, the OUR, consistent with good regulatory practice, makes allowance for a portion of these losses to be included in the respective NTL target.

For the GNTL, which is estimated at 10.84% of net generation, the OUR approves a target for GNTL of 9.7% of net generation.

The Office's determination on JPS' NTL targets to be applied at the 2018/2019 annual review, are set out in Table 4.39 below. Under the circumstances, the OUR considers these targets to be reasonable and also provides an incentive for JPS to reduce its overall NTL.

Table 4.39: OUR's Determined Targets for JPS' NTL for 2018/2019 Annual Review

Office Determination - JPS Non-Technical Losses Target for 2018/19 Annual Review				
	[2017/2018]	[2017/2018]	[2018/2019]	[2018/2019]
ASPECT OF SYSTEM LOSSES	JPS PROPOSED TARGET (% of Net Gen)	OUR's APPROVED TARGET	JPS PROPOSED TARGET (% of Net Gen)	OUR APPROVED TARGET
Non-Technical Losses (NTL) within JPS' Control (JNTL)	3.93%	3.50%	2.72%	**3.30%**
Non-Technical Losses (NTL) not totally within JPS' Control) (GNTL)	13.97%	9.80%	15.39%	**9.70%**

Office Determination on the Responsibility Factor (RF)

According to Schedule 3, Exhibit 1 of the Licence, one of the components of the system losses adjustment factor included in the annual revenue adjustment mechanism, will be dependent on a responsibility factor, denoted as RF.

As defined in Schedule 3 of the Licence, RF is the responsibility factor determined by the Office, which is a percentage from 0% to 100%. The RF shall be determined by the Office, in consultation with JPS, having regard to the: (i) nature and root cause of losses; (ii) roles of JPS and the Government to reduce losses; (iii) actions that were supposed to be undertaken

and resources to be allocated in the Business Plan; (iv) actual actions undertaken by the resources spent by JPS; (v) actual cooperation by the Government; and (vi) change in external environment that affected losses.

In section 1.2.6.1 (page 40) of its Annual Review Submission 2017, JPS proposes that a responsibility factor of 10%, be set, implying that this RF should only be applicable to losses due to "illegal users". However, according to the Licence, the RF should be applied to the total losses determined to be not totally within the control of JPS. Using JPS' NTL designations, this would refer to the total GNTL.

In arriving at its determination on RF for the system losses adjustment factor included in the annual revenue adjustment mechanism, the OUR considers, among other things, the following:

- The finding of the OUR's review and evaluation of JPS' NTL losses, including their orientation, causes, distribution, and allocations
- Actual loss reduction activities undertaken by JPS in 2016
- Reports from JPS that provide information on the degree of responsibility for NTL
- JPS' proposed loss reduction programmes and initiatives including funding after the Adjustment Date

Accordingly, the Office determines that the responsibility factor (RF) for JPS' NTL that are not totally within its control shall remain at **20%** for application at the 2018 annual review.

DETERMINATION 10

Non-Technical Losses

a) The Target for Non-Technical Losses (NTL) that are within the control of JPS, to be applied at the 2018 Annual Review shall be 3.3% of net generation.

b) The Target for Non-Technical Losses (NTL) that are not totally within the control of JPS, to be applied at the 2018 Annual Review shall be 9.7% of net generation.

Responsibility Factor (RF) for Non-Technical Losses

c) The RF applicable to JPS Non-Technical Losses (NTL) that are not totally within its control, to be applied at the 2018 Annual Review shall be 20%.

4.6. Extraordinary Rate Review: Current Portion of Long-term Debt (CPLTD)

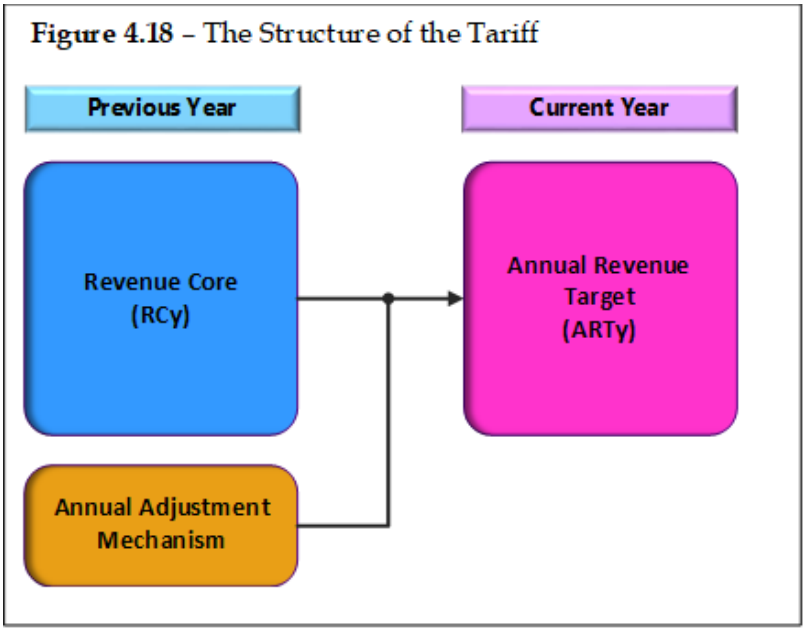
Background

JPS, in its Annual Review Submission 2017, applied for a J$973.4 million increase in its revenue requirement for the recovery of returns on the current portion of long term debt (CPLTD) through the Extraordinary Rate Review mechanism set out in the Licence. The company posits that the changes in its Licence which came into effect in 2016 July paved the way for this recovery. In its claim, JPS proposes the recovery of J$336.7 million in respect of unrecovered CPLTD returns in 2016 and another J$636.7 million for 2017.

Critical to the determination of whether JPS is entitled to any part or the entire sum of J$973.4 million is an understanding of the structure of the tariff coupled with a proper interpretation of Schedule 3 of the Licence.

The Structure of the Tariff

The new tariff structure may be categorized into two main components: (1) the revenue core; and (2) the annual adjustment mechanism. At the core of the tariff is the revenue requirement (RC_y) that is established once every five (5) years and this revenue core is used as the reference point for all adjustments in the years between Five Year Rate Reviews.



The annual adjustment mechanism is the conceptual device which is applied to the revenue core once per year to produce the JPS' annual revenue target (ART_y) (see Figure 4.18 above). The annual adjustment mechanism modifies the revenue core to enable the current annual revenue target to reflect the effects of:

a) inflation, quality of service and exogenous factors[12]
b) revenue deficits or surplus caused by volume changes and system losses performance
c) foreign exchange losses or gains and interest expense arising from late payment of customer bills

Interpretation of the Licence

Contrary to JPS' statement in its Annual Review Submission 2017 that "the Licence came into effect in July 2016", the fact is, the Licence became effective 2016 January 27. However, the annual adjustment mechanism delineated in the Licence became effective in 2016 July (designated in the Licence as the Adjustment Date). Exhibit 1 of the Licence states *"The Annual Revenue Target shall be adjusted on an annual basis, commencing July 1, 2016 (Adjustment Date)…"*

[12] Based on the 2016 Annual Tariff Adjustment Determination it also includes an efficiency factor, X.

Further, the Licence specifies that the annual adjustment should follow the precise mathematical formula stipulated therein. Therefore, the only component of the 2014 – 2019 tariff categorically targeted for change on 2016 July 1 was the annual adjustment mechanism of the tariff. In this respect, the directions given in the Licence is for the application of the annual adjustment mechanism to the revenue core to reflect the changes based on the elements of the formula. The Licence does not contemplate that in an annual review modifications will be effected within the revenue core set at the Five Year Rate Review.

With the introduction of the Licence on 2016 January 27, the OUR and JPS acknowledged that in the absence of transitional provisions from the price cap regime to revenue cap regime, the revenue requirement set out in the 2014-2019 Determination Notice would form the basis of the stipulated revenue core/requirement under the Licence. JPS in its *2016 annual tariff adjustment submission* indicated as follows:

> *"Given that the last rate determination did not contemplate a revenue cap regulation, a revenue cap, RC_y, specific to the 2016/2017 annual adjustment filing has not been established for the 2016/2017. JPS' position however, is that the 2016/2017 revenue target should be based on the revenue requirement established in the OUR's 2014-2019 rate determination with allowance made for efficiency improvement over the period, from the last rate review to the current adjustment period."*

Consequently, in the 2016 Annual Tariff Adjustment Determination, the annual adjustment mechanism outlined in the Licence was applied to the 2014-2019 revenue requirement to effect the annual adjustment.

JPS in its 2016 annual tariff adjustment submission signalled its intention to make an application to the OUR for Extraordinary Rate Reviews with respect to several items including the CPLTD. However, with regard to CPTLD, JPS did not immediately apply for an Extraordinary Rate Review but submitted same along with its application for the 2017 Annual Review. Paragraphs 27 – 29 of Schedule 3 of the Licence describes the elements to be considered when computing the revenue requirement. In so doing, CPLTD is referenced as a clarification note regarding the methodological treatment of long term financing in the Five Year Rate Review process. The provision reads as follows:

> *"For the avoidance of doubt, the current portion of long term debt should not be an off-set, since this is part of the long term funding of the Licensee."*

So under normal circumstances CPTLD item would be addressed in the Five Year Rate Review.

The Treatment of CPLTD in the Rate Review

Notably, tariff mechanisms are economic abstractions that do not perfectly reflect reality. In this regard, among other things, the operating cost of the company or the rate of return on investment seldom ever accord with forecast in the tariff model. However, from time to time, changes in the external environment or an increase in the stock of knowledge on a particular issue might signal the need for a methodological change to the tariff mechanism. This does not mean that the prevailing tariff mechanism should immediately be reconfigured to reflect these conceptual adjustments. For good order, it has been the practice to air and address such methodological changes at the Five Year Rate Review.

In all previous Five Year Rate Reviews, CPLTD has been treated as an off-set in the rate base. In fact, in making its 2009 and 2014 Rate Review Submissions, JPS requested that its rate base be reduced by US$66.0 million and US$37.5million as an off-set in the rate base for short term loans and CPTLD.

The request for an extraordinary treatment of CPLTD therefore reflects a methodological shift which although preferably addressed at the next Five Year Rate Review, must be considered based on the provisions of the Licence. In light of the changes in the Licence, particularly those captured in paragraphs 59 - 61 of Schedule 3, it is clear that the Extraordinary Rate Review properly construed contemplates the opening up of the rate base/revenue core to make appropriate changes in between the Five Year Rate Reviews. This may be undertaken whenever an exceptional circumstance causes a significant impact on the sector or JPS; and such a circumstance was not previously considered or known at the time of the preceding Five Year Rate Review. The only constraint prescribed is that the scope of the Extraordinary Rate Review should be limited to the impact of the exceptional circumstance. In other words, in light of the provisions for an Extraordinary Rate Review, where appropriate, the revenue core itself can be disturbed to accommodate the resolution of the impact of the triggering event on the sector or JPS.

Therefore based strictly on the provisions of the Licence, the Extraordinary Rate Review application for inclusion of the CPLTD is considered as such an instance, in which JPS could legitimately expect that the rate base/revenue core would be revisited.

Further, as set out in the 2017 Extraordinary Rate Review Determination and reiterated in section 4.3 above, the changes to the tariff arising from the rate review based on the revenue-cap construct is governed by two fundamental principles: (a) a forward-looking approach and; (b) an incremental approach. The former means that rates should not be adjusted retroactively in the Rate Review process while the latter refers to the fact that the adjustments to the rates "should be limited to the impact of the exceptional circumstance". Therefore in the application of the forward-looking principle to the treatment of CPLTD, only the return on investment related to the $37.5million for 2017 and beyond can be correctly allowed in the rate base. In this regard, JPS' claim in respect of J$336.7million as return on the CPLTD is denied. On the other hand, its J$636.7million claim for 2017 shall be allowed in the company's revenue requirement because it accords with the forward-looking approach.

DETERMINATION 11

JPS' claim for the recovery of a return of J$336.7million in respect of unrecovered CPLTD returns in 2016 has been denied by the Office because of the retrospective nature of the adjustment.

The recovery of J$636.7million in respect of the returns on invest in relation to the 2017 CPLTD has been approved since it accords with the forward-looking approach entrenched in the Revenue Cap methodology.

4.7. The Electricity Efficiency Improvement Fund (EEIF) and System Benefit Fund (SBF)

JPS is proposing that the EEIF be discontinued and instead, the System Benefit Fund (SBF) described in Electricity Act, 2015 be implemented in its place. JPS argues that the company today is in a better position to raise funding to implement power delivery infrastructure and therefore the need for the EEIF as it was proposed is not as severe as in time past.

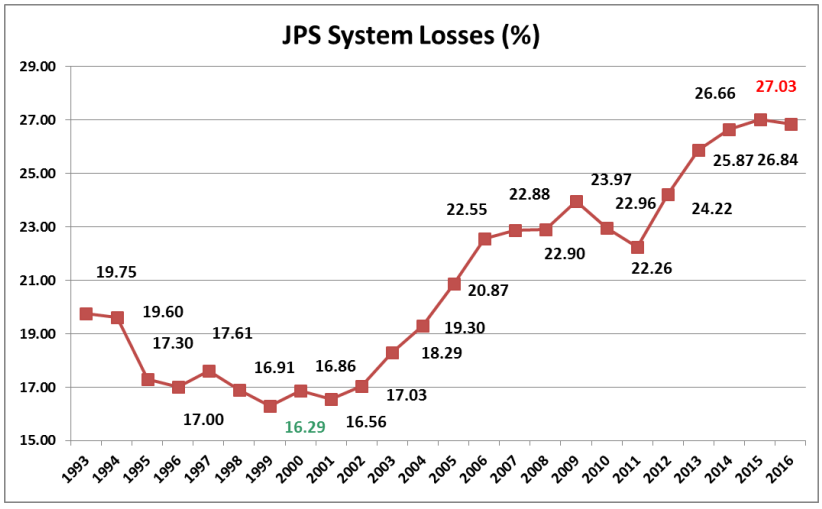
JPS further states that the challenge that the company is facing now is that customers in targeted communities are unable to afford the wiring of their houses and that the SBF could assist in addressing this issue.

Notably, the genesis of the special system losses fund (EEIF) came out of the OUR's Determination Notice – Tariff Review for Period 2009 – 2014, Jamaica Public Service Company Limited (JPS), Document No. Ele 2009/04:Det/03 (the 2009 Tariff Determination Notice). At that point the Office saw that there was an urgent need for greater efficiency improvement in the overall electricity system and made the following decision:

> "*the amount of 0.4 US c/kWh be set aside from the tariff for a special system losses fund that will be used specifically to implement Advanced Metering Infrastructure and other loss reduction technology.*"

The fact that JPS is now in a better position to raise funding to implement power delivery infrastructure suggests to the OUR that the company is better able to raise funding for loss reduction infrastructure/technologies, which was the primary purpose for the OUR's establishment of the EEIF. Furthermore, the OUR notes that at the establishment of the EEIF in 2009, JPS recorded system losses in the region of 22.7%. As reported in JPS' Annual Review Submission 2017, the 12-month rolling system losses for 2016 was 26.7%. Figure 4.19 below shows the general upward trend in the JPS system losses from 1993 to 2016. By this measure, the main objective of the EEIF (loss reduction) did not materialize given that instead of a reduction in system losses, losses increased by 4% during the life of the EEIF.

Figure 4.19: JPS System Losses Trend 1993 - 2016



According to section 50 of the Electricity Act, 2015, the SBF is to be administered and controlled by the Office and the resources shall be used:

a) to increase the penetration of renewable energy or energy security;
b) for the promotion of energy conservation;
c) for the purpose of providing electricity to rural areas; and
d) for any other purpose that the Minister may prescribe by Order published in the Gazette.

Based on on a strict interpretation of the provisions of the Electricity Act, 2015, the OUR is of the view that the SBF, when established, ought not to be used for the purpose of house wiring as suggested by the JPS. In any event, the use of the SBF for such an activity would only be permissible if prescribed by the Minister by way of an order published in the Gazette.

In a letter from MSET dated 2017 August 15, the OUR was informed that in light of indication that the OUR intends to discontinue the EEIF, the Minister is proposing that the SBF be established based on an annual inflow of US$5,000,000.00.

In this regard and in keeping with Section 50(1) of the Electricity Act, 2015, the Office has given favourable consideration to the request from MSET to replace the EEIF with the SBF with an initial amount of US$5,000,000.00 over a ten (10) month period.

Given that the termination of the EEIF coincides with the introduction of the SBF and the source of funding from both are the same, it is logical that any residual funds or outstanding obligation to the former be transferred to the latter. Preliminary evidence suggests that:

- at the end of 2016, JPS owes US$17.4 million to the EEIF by way of cumulative tax benefit since its introduction in 2009;
- additional tax benefits are due to the EEIF for 2017;
- there is the need for a reconciliation of EEIF expenditures against the revenue inflows to determine the residual sum to be transferred from the EEIF to the SBF

In the context of JPS' liability to the EEIF, and given the fact that these liabilities exceed the proposed US$5 million inflow for the new SBF, the Office has decided that:

a) There is no need to further increase the non-fuel rate to establish the SBF, but instead the SBF shall be financed at least initially, by way of JPS' liability to the EEIF;
b) Beginning 2017 September, JPS shall commence paying to the SBF US$0.5 million monthly for a ten (10) month period;
c) At the 2018 Annual Rate Review the Office shall determine JPS' outstanding liability to the EEIF and make a determination on how this amount should be transferred to the SBF.

The OUR is aware that the responsibility of administering the SBF as outlined in the Electricity Act, 2015, is no ordinary task since the purposes associated with its use are, implicitly, intended to spur economic development. In this regard, the regulatory principles

of transparency, efficiency and fairness will be central to the operation of the SBF. Consequently, the OUR will undertake the following in the establishment of the SBF:

a) Conduct an audit within the next three (3) months to determine JPS' precise liability to the EEIF.
b) Establish a segregated account independent of the OUR's activities for the administration of the SBF and advise JPS of the financial institution in which the SBF account is established within fifteen (15) days of the effective date of this Determination Notice.
c) Develop the rules for the administration of the SBF by 2019 January.

In light of the foregoing administrative matters, the SBF will not be used to finance any expenditure before the establishment of the rules.

DETERMINATION 12

a) Revenues collected through the Electricity Efficiency Improvement Fund, which was established in 2009 and collected through a separate line item on customers' bills, shall be discontinued.

b) The Office shall establish and operate the System Benefit Fund pursuant to section 50 of the Electricity Act, 2015 with an initial amount of US$5,000,000.00.

c) The Office rejects JPS' request for the System Benefit Fund to be used for the purpose of house wiring in targeted communities.

d) The System Benefit Fund shall be financed initially by deposit of funds by JPS from the outstanding balance in the Electricity Efficiency Improvement Fund. In this regard, JPS shall pay into the designated System Benefit account the amount of US$500,000.00 each month over the next ten (10) months commencing 2017 September to fund the said initial amount.

e) At the 2018 Annual Rate Adjustment, the Office shall determine how JPS will pay over the residual amounts owing to the Electricity Efficiency Improvement Fund to the System Benefit Fund.

4.8. Proposal for Wholesale Tariff to Improve Economic Efficiency

JPS' Annual Review Submission 2017 includes a proposal for a new Wholesale Rate customer category which it dubbed Rate 70. In its submission, JPS argues that the availability of LNG as an alternative fuel source in Jamaica has heightened the risk of grid defection among large industrial energy consumers. In this regard, it has proposed the Rate 70 class for customers with peak demand at a single location at 2MVA and above. The Rate 70 class concept is based on the notion of a best alternative option (BAO) which would set the price

of electricity sold to that new customer category equivalent to cost of these customers generating their own electricity independent of the national grid.

JPS' claims its simulation indicates that the BAO cost of self generated electricity with a peak demand of 2MVA is 16.83 US c/kWh. Consequently, the JPS has proposed that the price of electricity for the Rate 70 customers be set at the same level. Implicit in JPS' 16.83 US c/kWh proposal is the notion that it would enhance the economic competitiveness of the twenty-nine (29) customers that would qualify for the rate and discourage departure from the grid. It would therefore take pressure off the average price electricity for other JPS customers over the medium to long term since large customers would be less inclined to exit the grid. In the absence of this, JPS portends that defection from the grid will raise the average cost of electricity for the all the remaining customers.

Notably, JPS simply assumed that the request for the Rate 70 class is a normal part of the annual adjustment submission. However, such rate class development is not stipulated within the normal Annual Review process outlined in Exhibit 1 of the Licence.

Analysis of the Proposal

The Licence is clear regarding the approach to rate design. Paragraph 36, Schedule 3 of the Licence states that in proposing new rates the Licensee must take the following rate design principle into account:

a) Cost-reflectivity
b) Economic efficiency
c) Non-discrimination among users
d) Regulatory compliance
e) Government policy

JPS did not supply any information drawing on the principles delineated above in support of its Rate 70 application. Notwithstanding, the Office is mindful that the Licence requires the Licensee to:

> *"provide an adequate, safe and efficient service based on modem standards, to all parts of the Island of Jamaica at reasonable rates so as to meet the demands of the Island and to contribute to economic development."*

The Office is also aware that subsection 4A of the OUR Act, 2015 requires that wider economic concerns beyond the electricity sector ought to be taken into consideration in the rate making process. A specific consideration to be taken into account is, *"the possibility of including specific tariffs for special economic zones, and wholesale tariffs for large customers, to enhance their competitiveness and Jamaica's economic development."*

The Office is also cognizant that *ceteris paribus* a significant migration from the grid by the largest consumers would indeed increase the price burden on small users.

In light of this, the OUR has taken the decision to consider the application for the Rate 70 category because the OUR considers it critical to signal at this point, its acceptance of the need to move in the direction of special economic development tariff, to mitigate the risk of grid defection and alleviate the burden that will be imposed on smaller customers. The Office

wishes to make clear, however, that any further such request will be strictly required to meet the specified condition and be attended with the supporting information.

Based on information provided by JPS subsequent to its Annual Review Submission 2017 it BAO was derived from a self-generation model which assumes that the customer that has opted or will opt to get off the grid is operating a plant with the following characteristics:

- Plant life: 16 years.
- Generation capacity: 2MW.
- Plant Availability: 95%
- Average fuel cost of 13.00 US c/kWh.

Given the capital cost and the expected operating and maintenance cost assumed, JPS expects that the cost to the self-generator would be 16.83 US c/kWh for the first ten (10) years of the project and 17.34 US c/kWh for the next six (6) years.

The OUR is of the view that the proposed 16.83 US c/kWh appears to understates the cost of such an operation since there is no evidence that any consideration was given to the cost of storage or alternatively the purchase of back-up service from the grid given the reliability of the plant. Furthermore, such an analysis should have been informed by a cost of service study.

Office Decision

Notwithstanding, JPS' failure to submit a cost of service study in support of its Rate 70 request, the Office is mindful that the risk of grid defection is more than just speculation. Furthermore, given the MVA demand of the customers that are likely to defect, it could lead to the recovery of the company's revenue requirement over a small kWh sale pool. This would lead to further rate increase and possibly even more grid defection.

Against this background, while not accepting the proposed 20% reduction in the average rate of the customer targeted for Rate 70 treatment, the Office has approved the establishment of an Interim Rate 70 class. This new group of customers will see a 10 % reduction in their rates for the 2017/18 period. Additionally, this new customer class will only be allowed to continue beyond 2019 August, if and only if, JPS provides a supporting cost of service study by 2018 April, supporting a restructuring of the existing classes, to the OUR for review.

DETERMINATION 13

The Office approves the introduction of a new interim rate class (Rate 70) for customers whose peak demand at a single location is at or above 2MVA. The average rate of this Rate 70 group shall be set lower than the Rate 50 class in keeping with the schedules in this Determination Notice.

4.9. Pre-Paid Rates

4.9.1. Residential Customers (Rate 10) Prepaid Rates

The JPS has proposed that the structure of the Rate 10 prepaid tariff be changed to a two-tiered one as originally approved in 2015 when pre-paid metering was originally approved by

the OUR in its 2014 – 2019 Determination Notice. In the 2016 annual tariff adjustment filing, JPS requested a change in the structure from two-tiers to three-tiers. This, JPS stated, was to avoid a potentially significant shortfall if large numbers of customers were to switch from post-paid to pre-paid service. In the 2016 filing, JPS also posited that the then current two-tiered rate structure presented a clear arbitrage opportunity for prepaid customers relative to their post-paid counterparts. JPS was of the view that whatever rate structure is implemented the principles of fairness and non-discrimination should be present, allowing all customers in the same class to be treated in a similar manner. At that time, JPS' analysis indicated that a three-tiered "Pay As You Go" ("PAYG") rate structure would more accurately capture the essence of the equivalent post-paid rates. In the 2016 Annual Tariff Adjustment Determination, the Office gave a no objection to JPS' request.

In its Annual Review Submission 2017, JPS states that since the implementation of the three-tiered structure in 2016, the company is being faced with significant backlash from its PAYG customers. Furthermore, JPS claims that PAYG customers have cited, the lack of simplicity, difficulty in understanding the billing and the significant variation in payments throughout the month, as reasons against the three-tier structure. According to JPS, the company has conducted a focus group discussion with its PAYG customers and is now of the view that there is a need to revert to the previous two-tiered structure. JPS states that its previous arguments for the three-tiered structure remain, however they have noted that the relatively small number of PAYG customers at this time makes its previously stated risks one that is now manageable. JPS is now requesting the OUR's approval to revert to the two-tiered structure.

The OUR in reviewing JPS' request notes the concerns that have been raised by the PAYG customers. The intention of the pre-paid metering service, as originally presented by the JPS, is to make payment options available primarily to its residential customers in a way that puts them in a position to better manage their consumption and ultimately the amount they pay to JPS. In this regard, the OUR has no objection to JPS returning to the two-tiered rate structure for Rate 10 prepaid customers. The OUR however maintains the position that JPS shall ensure that the benefits of the lifeline rate must accrue to all residential customers including those with pre-paid metering.

Tables 4.40 and 4.41 below sets out JPS' position on Prepaid Rates. Using JPS' proposed tariffs and assuming that all residential customers migrate from post-paid to PAYG metering, JPS would be revenue neutral for customers with consumption levels above 100kWh[13] for both the two-tiered and the three-tiered structures. However, for consumption levels below 100kWh [119kWh] pre-paid customers would benefit in the amount on J$27.5million/month using the two-tiered structure.

Table 4.40 Comparison of prepaid and postpaid non-fuel bills for average consumption in intervals (JPS) – Two-Tiered

[13] 119kWh is the breakeven consumption for pre-paid customers in the JPS' model

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	77,560	21,733	23.35	31.07	16.29	56,268,577.82	29,501,613.54	(26,766,964.28)	(321,203,571.36)
50-100 kWh	104,156	96,715	77.38	16.38	16.29	132,016,105.17	131,290,741.95	(725,363.22)	(8,704,358.64)
100-200 kWh	200,835	350,207	145.31	17.57	17.57	512,751,175.74	512,751,175.74	-	-
200-300 kWh	83,182	241,171	241.61	19.88	19.88	399,540,348.04	399,540,348.04	-	-
300-400 kWh	29,266	120,275	342.48	20.90	20.90	209,481,111.31	209,481,111.31	-	-
400-500 kWh	11,979	63,818	443.96	21.46	21.46	114,128,504.19	114,128,504.19	-	-
500- 1000 kWh	13,067	199,976	1,275.32	22.70	22.70	378,286,566.19	378,286,566.19	-	-
>1000 kWh	3,697	87,961	1,982.71	22.94	22.94	168,152,009.28	168,152,009.28	-	-
Total	**523,742**					**1,914,355,820**	**1,913,630,457**	**(27,492,328)**	**(329,907,930)**

The OUR approved rates set out in Table 4.41 below shows the revenue comparisons of the prepaid and post-paid rates using the assumption that all post-paid customers migrate to pre-paid metering. For consumption levels below 114kWh pre-paid customers would benefit in the amount on J$26.6million/month using the two-tiered structure.

Table 4.41 Comparison of prepaid and postpaid non-fuel bills for average consumption in intervals (OUR) – Two-Tiered

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 (Pre - Postpaid)	Annual Variance
0-50 kWh	77,560	21,733	23.35	28.53	15.03	51,667,589	27,224,583	-24,443,005	-293,316,063
51-100 kWh	104,156	96,715	77.38	15.30	15.03	123,342,265	121,153,342	-2,188,923	-26,267,080
101-200 kWh	200,835	350,207	145.31	16.60	16.60	484,573,845	484,573,845	0	0
201-300 kWh	83,182	241,171	241.61	18.89	18.89	379,544,352	379,544,352	0	0
301-400 kWh	29,266	120,275	342.48	19.90	19.90	199,444,046	199,444,046	0	0
401-500 kWh	11,979	63,818	443.96	20.45	20.45	108,776,998	108,776,999	0	0
501- 1000 kWh	13,067	199,976	1,275.32	21.67	21.67	361,205,805	361,205,805	0	0
>1000 kWh	3,697	87,961	1,982.71	21.91	21.91	160,584,500	160,584,500	0	0
Total	**523,742**					**1,817,471,811**	**1,815,282,888**	**-26,631,928**	**-319,583,141**

The benefit of the lifeline rate is maintained with the prepaid metering service. A typical customer consuming 82kWh for the month would pay approximately J$1,228.50 (non-fuel) using the post-paid service and J$1,232.64 (non-fuel) using the pre-paid service.

DETERMINATION 14

The Office has no objection to JPS returning to the two-tiered rate structure for Rate 10 prepaid customers.

The approved non-fuel pre-paid rates are as follows:

J$15.0322/kWh for the first 114 kWh within a thirty (30) day consumption cycle
J$22.3270/kWh for each additional kWh thereafter within that thirty (30)-day consumption cycle.

The prepaid rates shall be reviewed at the next Annual Review.

4.9.2. Small Commercial Customers (Rate 20) Prepaid Rates

The pre-paid tariff for small commercial customers (Rate 20) was approved in the Jamaica Public Service Company Limited Annual Tariff Adjustment 2015 – Determination Notice Document No. Ele 2015/ELE/007DET.001 ("2015 Annual Tariff Adjustment Determination Notice"). JPS has not requested any change to the design of this tariff.

The non-fuel tariff to be charged for this service shall remain revenue neutral when compared to existing post-paid rates for Rate 20 customers. The approved non-fuel rate for Rate 20 post-paid customers were used to compute the pre-paid rates.

The rates to be charged are as follows:

First	10kWh	J$116.95/kWh
Additional	kWhs	J$18.4234/kWh

The analysis of the approved rates showing revenue neutrality is illustrated in Table 4.42 below.

Table 4.42 Comparison of prepaid and postpaid non-fuel bills for average consumption in intervals – Rate 20 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	10,515	2,690	21.32	64.64	64.64	14,490,274	14,490,274	-	-
(50-100] kWh	7,582	6,803	74.77	31.60	31.60	17,915,026	17,915,026	-	-
(100-1000] kWh	30,470	127,255	348.03	21.25	21.25	225,394,322	225,394,322	-	-
(1000-7500] kWh	9,488	283,849	2,493.05	18.82	18.82	445,136,977	445,136,977	-	-
>7500 kWh	1,035	206,590	16,633.66	18.48	18.48	318,193,869	318,193,869	-	-
Total						**1,006,640,194**	**1,006,640,194**	**-**	**-**

DETERMINATION 15

The approved non-fuel tariff to be charged for Rate 20 prepaid service in comparison to the existing postpaid rates shall be revenue neutral and shall be applied as follows:

First	**10kWh**	**J$116.95/kWh**
Each additional	**kWh**	**J$18.4234/kWh**

The prepaid rates shall be reviewed at the next Annual Review.

4.10. Community Renewal Programme (CRP)

In 2015, JPS launched a community renewal pilot project in seven (7) communities in Kingston and St. Andrew for the implementation of a CRP. In 2016, the project was expanded to include St. Catherine, St. James and Westmoreland. JPS states that the CRP is seeking to identify innovative ways to uplift and empower communities through electricity regularization as well as through social intervention initiatives. According to JPS, in 2016 a list of interventions such as: house wiring, energy audits, community facilitation, skills training, and light bulb swap were offered to residents in the communities. These interventions were offered free of cost or at minimal costs to residents. JPS further states that the main reasons for its intervention is to assist in the conversion of consumers to customers and to promote sustainable behavioural change by keeping persons engaged throughout the communities.

JPS explains that the initiative has had some success, as is manifested in an increase in billed sales in the targeted communities as well as a reduction in the system losses in a few of these communities. JPS posits that even though billed sales have increased, losses are still too high.

According to JPS, surveys done by the company, USAID and the World Bank show that the lack of income was the main reason for the non-payment of bills in these communities. Thus, for 2017 JPS indicates that the programme will be focusing on employment oriented initiatives that will provide work experiences that give community members an avenue to enter the work force.

JPS' plan for 2017 is to regularize 2,500 consumers, who are currently illegally abstracting electricity. This effort, JPS states, will result in an increase in billed sales of approximately 300MWh for 2017. The company seeks to achieve this by targeting high loss communities in Kingston and St. Andrew, St. James, Westmoreland, St. Catherine and Clarendon. Some of the proposed plans to be implemented by JPS include: continuing to work with the Jamaica Social Investment Fund (JSIF) to improve the success rate for implementing the programme and a continuation of the energy management and customer education programme which will now be expanded in 2017 to include the appliance swap programme. This programme, according to the JPS, is expected to improve energy management and will be implemented through the energy management competition scheduled for 2017. The pre-paid metering programme, internship programmes, entrepreneurship workshops, health and wellness fair as well as the retention of community facilitators who will undertake promotional and educational activities, are all listed by JPS as part of the overall CRP business strategy.

4.10.1. Community Renewal Rate

In its 2015 Annual Tariff Adjustment Determination Notice, the Office gave approval for JPS to introduce the community renewal rate. The JPS, however, had not settled on the eligibility criteria. JPS in its 2016 annual adjustment filing stated that; "*Plans are being put in place for the implementation of the proposed community renewal rate (special tariff for 150kWh) for 2016. This will be informed by advanced discussions with PIOJ and PATH*." JPS states that its field work had shown that the GOJ's Programme of Advancement Through Health and Education (PATH) was too restrictive as only a limited number of people in the targeted communities were enrolled in the PATH programme.

JPS is requesting the OUR's approval to begin implementing the rates for those persons that are enrolled in PATH until the company is able to finalise an expanded eligibility criteria that could be implemented cost effectively. The OUR has no objection to this proposal. The JPS is encouraged to continue its exploration of various eligibility criteria that will enhance the effectiveness of the CRP.

The OUR is again approving a community renewal rate and JPS is being reminded that the rate is in keeping with Condition 14(1) of the Licence under "Changes and Terms and Conditions for the Supply of Electricity" which states that:

> *"The Licensee shall, save where it enters into special contracts with customers for the supply of electricity pursuant to section 14 of the OUR Act, charge its customers for such a Supply according to published rates, approved by the Office, as updated from time to time. Such published rates shall be cost-reflective, unless otherwise directed by the Office. Each rate category will apply uniformly across the Island and there will be no discrimination to customers on the rate charged based on location."*

The OUR maintains that there should be no discrimination in the tariff charged in each rate category. Further, at the next Five Year Rate Review in 2019, JPS shall apply an even rate to all residential customers.

DETERMINATION 16

The Office has no objection to JPS proceeding with the implementation of the approved Community Renewal Rate using as the eligibility criteria those persons who are enrolled in the PATH Programme. Any material change to the Community Renewal Programme should first be referred to the OUR for approval.

The approved Community Renewal Rate to be charged for Rate 10 service is a flat rate of J$9.59/kWh for consumption up to 150kWh. No customer charge will be applied to bills less than 150kWh.

Customers consuming more than 150kWh per month will pay the regular prepaid or post-paid rate, whichever is applicable for the incremental consumption above 150kWh per month.

The Community Renewal Rate and related conditions will be reassessed at the next Annual Review.

4.11. Fuel Cost Adjustment Mechanism – Heat Rate

JPS Heat Rate Proposal

For the 2017/18 adjustment period, JPS proposed a heat rate target for its thermal generating plants of **11,720 kJ/kWh**.

In its Annual Review Submission 2017, JPS asserts that in developing the proposed target, it took into consideration the following assumptions, parameters and conditions:

- Projected Maximum Capacity Rating (MCR) of the existing generation system (conventional and RE generation facilities);
- Forecasted Capacity Factor of the available thermal and RE generating plants; and
- Forecasted Energy Production (net generation) for the system and individual generating plants.

Against this background the OUR has examined the heat rate mechanism prescribed by the Licence, JPS' actual fuel cost, net generation and heat rate performance, as well as the company's projected performance. All of these factors have been taken into account along with a set of guiding regulatory principles to arrive at a target for the 2017/18 Tariff period which, from the Office's perspective, is both reasonable and achievable.

Licence Requirements - Heat Rate Target

According to Schedule 3, paragraph 37 of the Licence, the Office shall have the power to set targets for JPS' heat rate which should be reasonable and achievable.

Specifically, with respect to the setting of targets for JPS' heat rate by the Office, the legal requirements are set out under Schedule 3, paragraph 40 of the Licence, which provides as follows:

> *"The Office 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."*

FCAM and Efficiency Incentives

In keeping with Exhibit 2 of Schedule 3 of the Licence, JPS is allowed to recover its monthly fuel costs through a monthly fuel rate, based on a Fuel Cost Adjustment Mechanism (FCAM). The allowed Monthly Fuel Cost (F_m) is represented mathematically as follows:

$$\boldsymbol{Fm = \left[IPPs\ Fuel\ Cost + \left(JPS\ Fuel\ Cost \times \left(\frac{JPS\ Heat\ Rate\ Target\_Thermal}{JPS\ Heat\ Rate\ Actual\_Thermal}\right)\right)\right]}$$

And the monthly Fuel Rate is derived as follows:

$$F = \frac{F_m}{S_m}$$

Where, F = Monthy Fuel Rate (in J$ per kWh)

F_m = Total allowed fuel cost for the billing period

S_m = the kWh sales in the billing period

The derived monthly fuel rates should allow JPS to pass through its monthly fuel costs to electricity customers, subject to adjustment by an efficiency factor related to its actual and targeted heat rate. The efficiency adjustment is designed to incentivise JPS to improve its operational efficiency as well as to optimize its overall cost of generation. This incentive mechanism delivers financial benefits or penalties to the extent that there is any over-achievement or under-achievement of the determined heat rate target. Currently the heat rate target is set at 11,620 kJ/kWh.

Regulatory Principles Applied to Heat Rate Target

The heat rate target set by the OUR, is to ensure that electricity ratepayers are provided with fair and reasonable fuel rates. The target is also aimed at providing JPS with an incentive to improve fuel conversion efficiency.

In setting the heat rate target, the following regulatory principles are observed:

1) The target should hold the generating plant operator accountable for the factors which are under its direct control;
2) The target should encourage optimal generation dispatch of the available generating units to minimize the total cost of electricity generation which is mostly fuel cost;
3) The target should take into account legitimate System constraints provided that JPS is taking reasonable action to mitigate these constraints; and
4) The target shall be determined in accordance with the relevant provisions of the Licence.

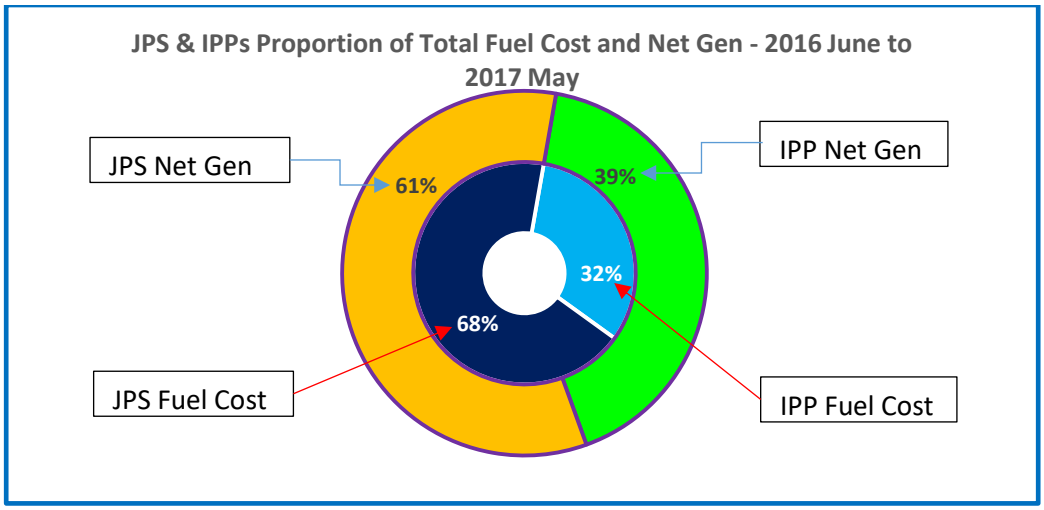
Fuel Cost, Fuel Price & Net Generation Review

JPS' and IPPs' Contribution to Total Fuel Cost

For the period 2016 June to 2017 May, approximately 68% of the average monthly fuel cost was attributed to fuel consumed in JPS' generating units while the remaining 32% represents the cost of fuel related to IPPs' generating plants. This fuel cost ratio exactly mirrors the generation system performance since the implementation of the 2014-2019 Determination Notice. In monetary terms, this translates to average monthly fuel costs applicable to JPS and IPPs of US$237.47 million and US$112.67 million respectively, aggregating to a total of US$350.14 million for the 2016/2017 period (see Figure 4.20).

Significantly, even though the IPPs account for approximately 32% the total fuel cost, they are responsible for 39% of the total net generation. This indicator suggests that together, the IPPs are more efficient at converting fuel into energy.

Figure 4.20: JPS' and IPPs' Fuel Costs and Net Generation (2016 June – 2017 May)



Fuel Supply Mix

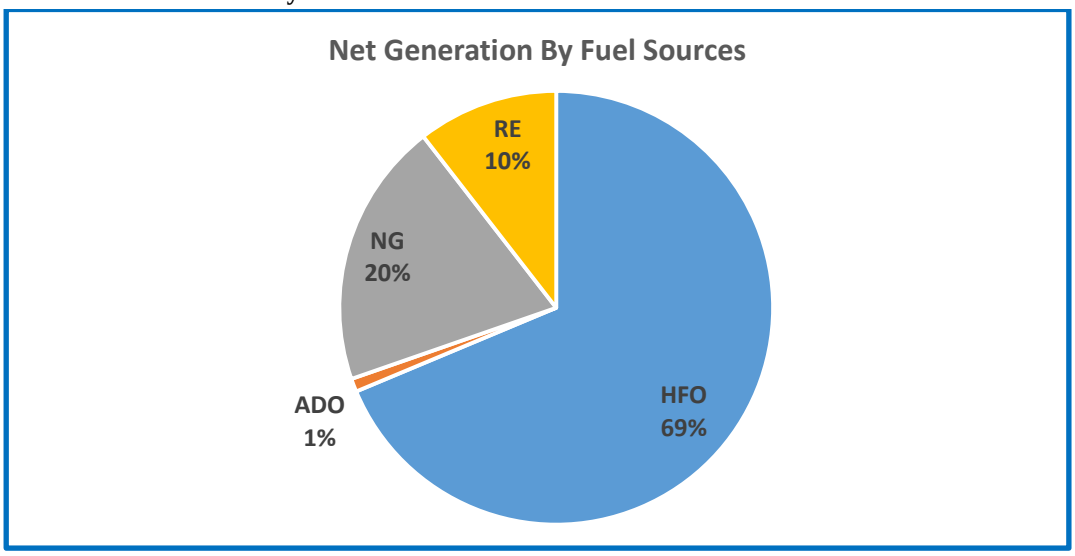
Introduction of Natural Gas (NG)

In the 2014-2019 Determination Notice, JPS was directed by the OUR to undertake a re-configuration of the Bogue CCGT unit to enable the unit to operate on gas-based fuels. This was consistent with one of the objectives of the National Energy Policy, 2009 (NEP) for energy diversification, and the goal of lowering the fuel price trajectory. Given the fact that fuel cost is more or less a pass-through to electricity customers, the OUR approved the amount of US$15 million by way of the Bogue Plant Reconfiguration Fund financed by electricity rate-payers in support of the project. This Fund was recovered through the customers' electricity rates. The project saw the introduction of Natural Gas (NG) into the fuel mix and commenced commercial operations on 2016 December 26. The total project cost (capital cost) was US$23.23 million.

Net Generation by Fuel Sources

With the inclusion of NG in the present fuel supply mix, the net generation from the various primary energy sources over the period 2017 January-May, was allocated as represented in Figure 4.21 below.

Figure 4.21: Net Generation by Fuel Sources



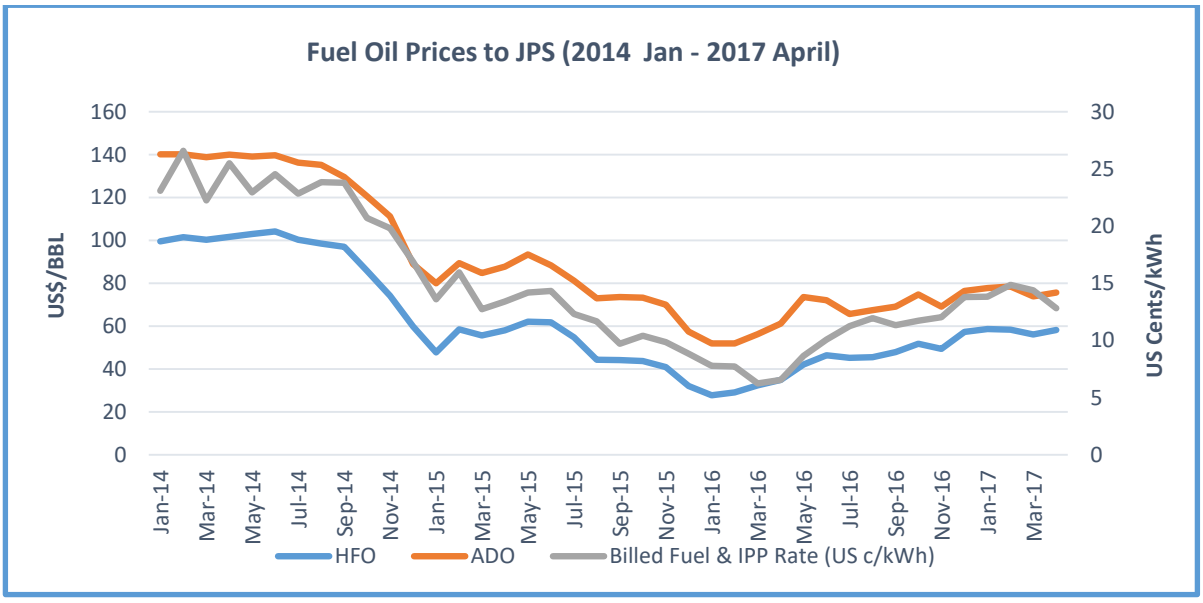
Fuel Price Variation

The fuel cost of electricity generation is linked to prices on the international fuel markets and as such, are subject to a high degree of volatility and unpredictability. Based on Petrojam's fuel oil billing invoices to JPS, over the period 2016 May – 2017 April, the average price of HFO delivered to JPS increased from US$42 to nearly US$59 per barrel. For the said period, the average price of ADO exhibited a degree of fluctuation in which it moved upward from US$73 in 2016 May to US$79 per barrel in 2017 February, but ended up at US$76 per barrel in 2017 April.

The relative movements in HFO and ADO prices and the monthly Fuel Rate for the period 2014 January to 2017 April are shown in Figure 4.22 below.

As illustrated in Figure 4.22 below, the movement in the monthly Fuel Rate over the period exhibited a similar profile to those of the fuel prices (HFO and ADO). Based on the relatively low price fuel environment since late 2014, the corresponding Fuel Rates in US cents per kWh basis have largely declined with the fuel charges currently representing approximately 50% of residential customers' electricity bill on average.

Figure 4.22: Fuel Oil Prices to JPS – 2014 to 2017



Review of JPS' Heat Rate Performance and Targets

JPS' Heat Rate Performance

As shown in Table 4.43 below, the average monthly heat rate of JPS' thermal plants for the 2014/15 period was 11,415 kJ/kWh but deteriorated slightly to 11,590 kJ/kWh during the 2015/16 representing a change of 175 kJ/kWh. The performance data also shows that during the 2015/16 period, there were two (2) instances when the heat rate target of 12,100 kJ/kWh was not achieved. During the 2016/17 adjustment period (up to 2017 May), the average monthly heat rate, improved markedly from 11,590 kJ/kWh to 11,211 kJ/kWh, representing a change of 379 kJ/kWh on average. For all months during the 2016/17 period, the actual average heat rate registered by JPS' generating units outperformed the established 11,620 kJ/kWh target (see Figure 4.23). Over the 2016/2017 period the actual monthly heat rate ranged between 10,953 kJ/kWh to 11,469 kJ/kWh, yielding an average monthly heat rate value of 11,211 kJ/kWh.

Table 4.43: JPS' Heat Rate Performance

JPS' Heat Rate Performance - (2014 July – 2017 May)									
Month	**Heat Rate (2014 July -2015 June)**			**Heat Rate – (2015 July -2016 June)**			**Heat Rate (2016 Jul -2017 June)**		
	JPS Projected (kJ/kWh)	**Actual (kJ/kWh)**	**OUR Target (kJ/kWh)**	**JPS Projected (kJ/kWh)**	**Actual (kJ/kWh)**	**OUR Target (kJ/kWh)**	**JPS Projected (kJ/kWh)**	**Actual (kJ/kWh)**	**OUR Target (kJ/kWh)**
July	11,699	12,276	N/A	11,358	11,523	**12,010**	10,996	11,218	**11,620**
August	11,652	11,645	N/A	11,170	11,124	**12,010**	10,983	11,065	**11,620**
September	11,761	11,352	N/A	11,546	11,351	**12,010**	11,046	11,463	**11,620**
October	11,618	11,349	N/A	11,413	11,327	**12,010**	11,240	11,448	**11,620**
November	11,531	11,142	N/A	11,518	11,403	**12,010**	10,905	11,469	**11,620**
December	11,468	11,054	N/A	11,396	11,107	**12,010**	10,861	10,953	**11,620**
January	11,387	11,492	N/A	11,943	11,996	**12,010**	10,980	11,158	**11,620**
February	11,400	11,186	**12,010**	12,080	12,175	**12,010**	11,000	11,181	**11,620**
March	11,994	11,615	**12,010**	11,941	12,240	**12,010**	10,888	11,148	**11,620**
April	11,183	11,190	**12,010**	11,903	12,044	**12,010**	10,868	11,081	**11,620**
May	11,148	11,343	**12,010**	10,902	11,436	**12,010**	10,907	11,134	**11,620**
June	11,332	11,335	**12,010**	11,002	11,352	**12,010**	11,209	-	**11,620**
AVERAGE	**11,514**	**11,415**	**12,010**	**11,514**	**11,590**	**12,010**	**10,990**	**11,211**	**11,620**

Figure 4.23 shows the profile of JPS' heat rate performance from 2014 July to 2017 May.

Figure 4.23: Illustration of JPS' Heat Rate Performance (2014 July to 2017 May)

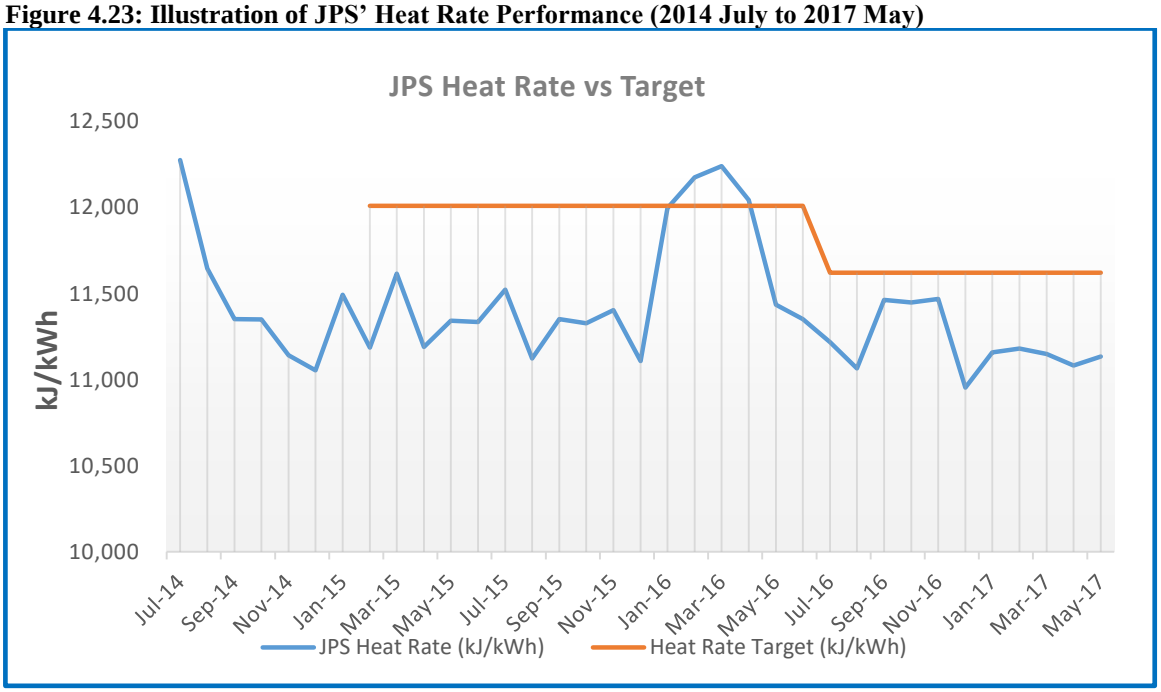
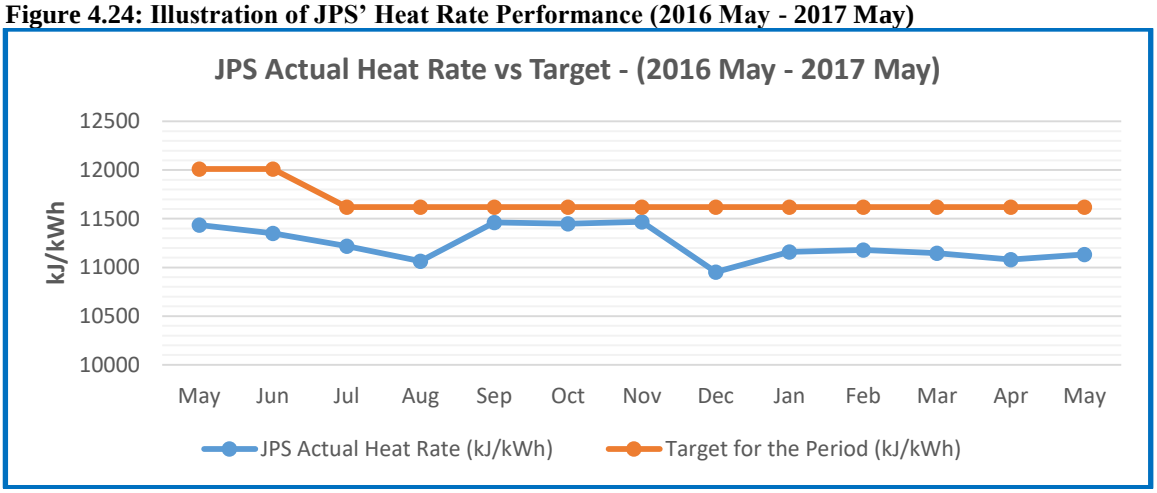


Figure 4.24 shows the profile of JPS' heat rate performance from 2016 May to 2017 May.

Figure 4.24: Illustration of JPS' Heat Rate Performance (2016 May - 2017 May)



This favourable heat rate performance by JPS resulted in substantial financial benefits flowing to JPS. According to JPS' system performance data, this outcome was largely influenced by the following factors:

- Improvement in the efficiency of the Rockfort Unit 1 (RF#1) resulting from a major overhaul of the unit carried out during 2017 January – February. Based on JPS' generation performance data, after the major overhaul, RF#1 heat rate reduced by approximately 100 kJ/kWh.
- Improvement in the efficiency of the Bogue CCGT unit resulting from the re-configuration project. Based on JPS' generation performance data, after the re-commissioning of the Bogue CCGT, the unit's heat rate reduced by approximately 100 kJ/kWh - 250 kJ/kWh depending on dispatch levels.
- There was an increase in total net generation from 4,209.3 GWh in 2015 to 4,343.8 GWh in 2016. The increased energy requirements in 2016, may have caused JPS' thermal generating units to operate more at their optimal levels during the year, consequently, increasing their overall operational efficiency on average.

These indicated improvements in JPS' heat rate performance are factored into the determination of the heat rate target for the 2017/18 tariff adjustment period.

JPS' Heat Rate Proposal

JPS' Heat Rate Forecast

In support of its proposal for the heat rate target to be set at 11,720 kJ/kWh, JPS has forecasted average monthly thermal heat rates of 11,270 kJ/kWh and 11,254 kJ/kWh for 2017 and 2018 respectively (see Table 4.44).

JPS posits that its thermal heat rate performance over the 2017/18 adjustment period will depend on several factors affecting the economic dispatch which include the following:

1) Growth in system demand

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

JPS contends that while all the above factors influence the resultant system heat rate, the company has sole direct control over only a few. The company took the view that the heat rate target setting process must consider the effect of a major failure of one of the key steam turbines in the fleet that are now at the end of its useful life. It further noted that the unreliability of some of these assets are beginning to show with Old Harbour Unit #3 (OH#3) having boiler tube leak incidents for at least eight times in 2016 and Unit #2 operating with turbine cracks.

Table 4.44: JPS' Forecasted Heat Rates for 2017 and 2018.

	JPS Forecasted Thermal Heat Rates for 2017 and 2018													
	YEAR	**Jan**	**Feb**	**Mar**	**April**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**AVG**
kJ/ kWh	2017	11,235	11,136	11,188	11,225	11,343	11,247	11,355	11,343	11,372	11,271	11,265	11,243	11,269
kJ/ kWh	2018	11,235	11,136	11,188	11,132	11,257	11,247	11,355	11,343	11,372	11,271	11,265	11,243	11,254

Source Data: JPS Annual Review Submission 2017

Specifically, with respect to the proposed heat rate target, JPS argues that its proposal is based on the planned mix of generating units, including IPPs, their projected availability and dispatch, and the foregoing discussion of heat rate affecting variables and the possible variation in heat rate performance for reasons beyond JPS' control. JPS has proposed that the target should take into account forced outage outliers.

While JPS did not provide any insight into the methodology used to derive its forecast, the heat rate projections for 2018 are almost a duplicate of those forecasted for 2017. This seems to suggest that the System Operator will be expecting, similar demand profiles, generation system configuration, generation dispatch and system constraints for 2018 as that assumed for 2017.

OUR's Review of JPS' Heat Rate Proposals

Generating Unit Performance

During the heat rate evaluation, special focus was directed to the performance of a number of JPS' generating units, particularly those with heat rates below 10,000 kJ/kWh.

Bogue CCGT Unit

The Bogue CCGT unit (114 MW) was reconfigured in 2016 to operate as a dual fuel generating unit with NG being the primary fuel and ADO as alternative (back-up) fuel. According to the regulatory reports submitted by JPS to the OUR, the re-configuration project commenced 2016 January with major components of the unit taken out of service according

to schedule to facilitate the related works. The project was reported to be completed at the end of 2016 December.

Since the unit returned to service, subsequent regulatory reports from JPS to the OUR, revealed noticeable improvements in the unit's average heat rate during the period of operation. This improvement in heat rate ranged between 100 kJ/kWh to 250 kJ/kWh, which was factored in the heat rate evaluation and derivation of the heat rate target. The average monthly heat rates for the Bogue CCGT unit from 2016 January to 2017 May are shown in Table 4.45 below. As shown in Table 4.45, since 2016 May up to 2017 May, the unit consistently operates at an average heat rate of below 9,000 kJ/kWh.

Table 4.45: **Bogue CCGT Average Monthly Heat Rates**

Bogue CCGT Average Heat Rates 2016 Jan to 2017 May													
	YEAR	**Jan**	**Feb**	**Mar**	**April**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
kJ/ kWh	2016	9,334	9,293	9,758	9,200	8,914	8,869	8,896	8,915	9,043	9,306	8,809	8,820
kJ/ kWh	2017	8,788	8,857	8,823	8,989	8,997	-	-	-	-	-	-	-

Rockfort Unit #1 (RF#1)

During the period 2017 January 9 to 2017 February 1, a major overhaul of RF#1 (20 MW) was carried out by JPS. According to regulatory reports from JPS to the OUR, since the unit resumed operation, in 2017 February, there has been an improvement in the average monthly heat rate of the unit of approximately 100 kJ/kWh. This result was also factored in the heat rate evaluation and derivation of the heat rate target. The average monthly heat rates for the RF#1 from 2016 January to 2017 May are shown in Table 4.46 below. As shown in Table 4.46, since 2017 February, the unit has consistently operated at an average heat rate of about 9,000 kJ/kWh.

Table 4.46: **RF#1 Average Monthly Heat Rates**

RF#1 Average Heat Rates 2016 Jan to 2017 May													
	YEAR	**Jan**	**Feb**	**Mar**	**April**	**May**	**June**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
kJ/ kWh	2016	9,334	9,187	9,127	9,127	9,176	9,231	9,084	9,072	9,137	9,112	9,131	9,174
kJ/ kWh	2017	9,192	8,985	8,975	9,061	9,035	-	-	-	-	-	-	-

Old Harbour Unit #2 (OH#2)

OH#2 an oil-fired steam generating unit owned and operated by JPS was commissioned in 1970 for base-load operation. It currently has gross capacity of approximately 60 MW.

In 2017 February, JPS alerted the OUR that it was faced with an operational risk having discovered a number of cracks on the OH#2 turbine rotor during the last major overhaul in 2016. On 2017 March 7, in response to a request made by the OUR for a report on the situation, JPS submitted a report which indicated that an independent turbine specialist had been invited to provide expertise in determining the extent of the cracks and to make recommendations based on their findings.

In addition, based on its 2016 generation maintenance plan, Old Harbour Unit 2 was removed from service on 2016 August 05 to facilitate the overhaul of the turbine and other equipment. A preliminary inspection during the maintenance operation revealed that the turbine rotor seemingly developed several axial and circumferential cracks in the high pressure gland area.

Arising from the recommendation from the independent turbine specialist, a decision was taken by JPS to reopen the turbine after six (6) months of operation and retest using the base line depth checks of 2016. This inspection was scheduled for April 2017.

Following the 2017 April inspection, JPS revealed that the initial findings, may have overstated the extent of cracks. This implies a downgrading of the potential operational risks. However, the situation is still being assessed.

Based on the OUR's evaluation, there is still some probability for shortfall in generation capacity due to a forced outage of this unit. However, based on the current mode of operation and existing heat rate curve of the unit, the impact of its operation on JPS' monthly thermal heat rate is not significant. Accordingly, OH#2 was not considered a major factor in the determination of the heat rate target.

OUR's Determination on JPS' Heat Rate Proposal

Given that JPS has forecasted average monthly heat rates, it is not clear how JPS arrived at the proposed target given the forecasted thermal heat rates. The proposed heat rate target was given as 11,720 kJ/kWh.

Based on the technical & operational capability and configuration of JPS' thermal generating system, which were considered in the heat rate evaluation as outlined above, it is expected that the determined heat rate target will be successfully achieved by JPS for each month during the 2017/18 annual review period.

JPS' heat rate forecast of 11,269 and 11,254 kJ/kWh for 2017 and 2018 are credible considering, among other things:

- the reduction in the heat rate of the Bogue CCGT and RF#1 which are expected to be sustained over the period;
- recent efficiency improvements on other existing JPS generating units;
- the expected efficiency improvements from scheduled major maintenance and major overhaul of other JPS generating units during the period;
- expected benefits from other existing and planned efficiency improvement programmes; and
- effective management of generation dispatch and system operating constraints.

Significantly, this proposed target is 100 kJ/kWh higher than the previous target, even though the company's actual performance improved over the 2016/17 period. Consequently, given the OUR's own analysis, it has taken the view that arising from the factors identified above, the heat rate target should be 11,450 kJ/kWh which is 196 kJ/kWh higher than JPS' forecasted average heat rate for the period.

A comparison of JPS 2017/18 monthly heat rate projections against the 11,450 kJ/kWh target is shown in Table 4.47 and Figure 4.25 below.

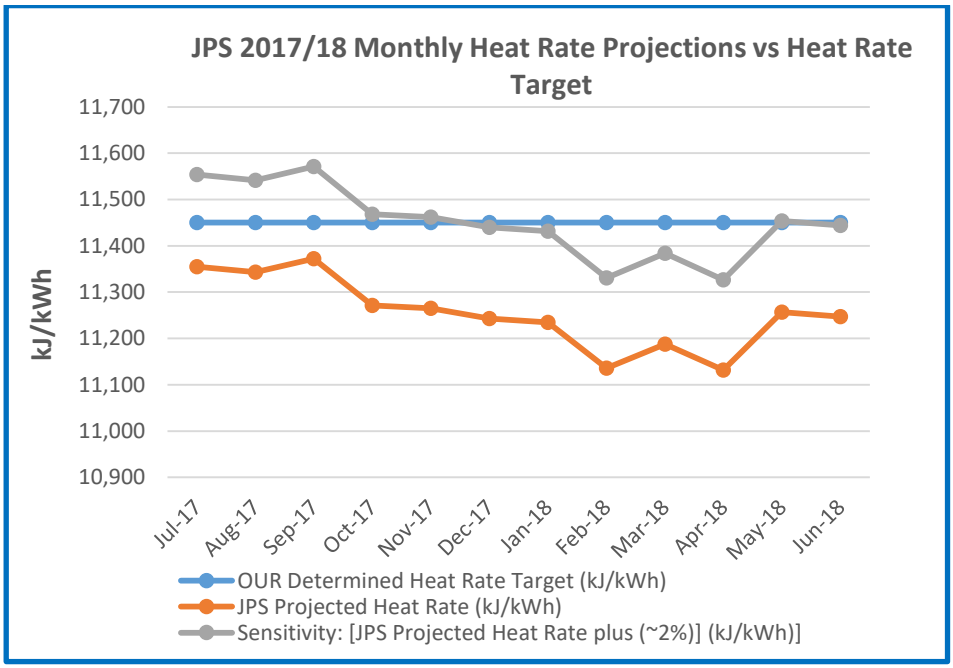
Table 4.47: JPS' 2017/18 Forecasted Heat Rates versus Heat Rate Target

JPS 2017/18 Monthly Heat Rate Projections versus Heat Rate Target						
DATE	**JPS Proposed Heat Rate Target (kJ/kWh)**	**OUR Determined Heat Rate Target (kJ/kWh)**	**JPS Projected Heat Rate (kJ/kWh)**	**Sensitivity Case: [JPS Projected Heat Rate plus (~ 2%)] (kJ/kWh)**	**Variance: [OUR Target minus JPS Projected Heat Rate] (kJ/kWh)**	**Variance: [OUR Target minus Sensitivity Case] (kJ/kWh)**
2017 July	11,720	**11,450**	**11,355**	11,554	**-95**	104
2017 August	11,720	**11,450**	**11,343**	11,542	**-107**	92
2017 September	11,720	**11,450**	**11,372**	11,571	**-78**	121
2017 October	11,720	**11,450**	**11,271**	11,468	**-179**	18
2017 November	11,720	**11,450**	**11,265**	11,462	**-185**	12
2017 December	11,720	**11,450**	**11,243**	11,440	**-207**	-10
2018 January	11,720	**11,450**	**11,235**	11,432	**-215**	-18
2018 February	11,720	**11,450**	**11,136**	11,331	**-314**	-119
2018 March	11,720	**11,450**	**11,188**	11,384	**-262**	-66
2018 April	11,720	**11,450**	**11,132**	11,327	**-318**	-123
2018 May	11,720	**11,450**	**11,257**	11,454	**-193**	4
2018 June	11,720	**11,450**	**11,247**	11,444	**-203**	-6
AVERAGE	**11,720**	**11,450**	**11,254**	**11,451**	**-196**	**1**

The analysis shows that for each month during the 2017/18 period, the 11,450 heat rate target would be successfully achieved by JPS, within a range of 78 kJ/kWh and 318 kJ/kWh.

As part of the analysis, a sensitivity case was defined using JPS' 2017/18 forecasted monthly heat rates scaled up by about 2%and this was compared against the determined heat rate target. This comparison shows that even with a 2% upward deviation (worsening) in the projected heat rates, JPS should still be able to achieve the target on average over the period. This level of variance, provides JPS sufficient latitude and flexibility to absorb effects of potential forced outages or other operational constraints that may be encountered.

Figure 4.25: Illustration of JPS' 2017/18 Forecasted Heat Rates versus the 11,450 Target



OUR's Determined Heat Rate Target

Having reviewed JPS' heat rate proposal, the Office accepts the credibility of the company's heat rate forecast. Consequently, the OUR finds the proposed heat rate target of 11,720 kJ/kWh to be excessive. It is neither reasonable nor consistent with its own 2017/18 forecast, which essentially reflects, to a reasonable degree, the technical and operational capability of its thermal generating system.

In light of this, the Office determines that the heat rate target for JPS' thermal generating system for the 2017/18 tariff adjustment period shall be **11,450 kJ/kWh.** This determined heat rate target in conjunction with JPS' thermal heat rate (actual) for the applicable month shall be used for efficiency adjustments in the defined FCAM.

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a) The heat rate (actual) to be used by JPS in the defined FCAM for efficiency adjustment each month shall be based on the performance of JPS' thermal generating system.

b) JPS' heat rate target for the 2017/2018 annual review period shall be 11,450 kJ/kWh.

5. Revenue Basket Compliance

The requested annual adjustment resulting from changes in the inflation offset index, including efficiency gains and changes in quality of service, is to be applied to the base year revenue requirement. JPS is allowed to adjust the tariffs for each rate class on the basis that the percentage change does not result in an increase of the annual rate of change in non-fuel electricity revenues (dPCI). The adjusted tariffs should also accord with the 2014 - 2019 Determination Notice and Addendum 1, whereby JPS is allowed to recover its revenue requirement by 23% fixed charges and 77% variable charges. The effective change in the non-fuel revenue is the dPCI offset by surcharges less the cumulative movements due to foreign exchange rate changes.

The annual adjustment factor for the non-fuel base revenue of 23.465% [derived from dPCI = (dI = 18.58%) ± (Q = 0%) ± (Z = 4.89%)] is adjusted to take account of revenue surcharge (RS_{2016}), foreign exchange surcharge (SFX_{2016}) and net interest expense/(income) surcharge (SIC_{2016}). The cumulative change of 11.02% due to foreign exchange rate movements (Base Exchange $Rate_{2014}$ – US$1: J$112; Adjusted Billing Exchange $Rate_{2016}$ – US$1: J$131.00) is accounted for in customers' bills on a monthly basis. The effective increase in non-fuel rates is 3.02%. See Tables 5.1 and 5.2 below.

Table 5.1 Details of Annual Inflation Adjustments: 2016-2017

Annual Non-Fuel Revenue Adjustment 2017	
Growth Rate in Inflation and Exchange Rate (dI) for 2017	18.58%
Z-Factor	4.89%
dI adjustment and Z-Factor	**23.46%**
Change attributed to Surcharges,CPLTD & Rate Base Adj.	-3.41%
Change attributed to Actual Non Fuel Revenue for 2016 (Already accounted for in customers' bills)	16.66%
Effective Non-Fuel Revenue Change for 2017	**3.02%**

Table 5.2: Details of Revenue Adjustments: 2016-2017

Annual Non-Fuel Revenue Adjustment 2017 (J$)	
Base Year$_{2014}$ Non-Fuel Revenue Adjusted with X-Factor of 1.10% (RC$_{2017}$)	40,157,997,389
Foreign Exchange, Interest and Non-Fuel Revenue Surcharges (SFX$_{2016}$ - SIC$_{2016}$ + RS$_{2016}$)	(2,001,420,124)
Extra-Ordinary Rate Review - CPLTD Adjustments	636,757,042
Adjustments to 2016 Rate Base	-
Adjustments to 2014 Rate Base (2017 Depreciation)	260,585,618
Annual Non-Fuel Revenue Target for 2017 (ART$_{2017}$)	**48,263,011,298**
Actual Non-Fuel Revenue for 2016	**46,848,679,836**
Effective Non-Fuel Revenue Change for 2017	**1,414,331,461**

Table 5.3 below shows the OUR approved annual adjustment factor of 3.02% that is applied to each revenue component in the revenue basket for the 2017-2018 period.

Table 5.3 Annual Non-Fuel Adjustment per Revenue Component: 2017-2018

Class					Demand-J$/KVA			
		Block/Rate Option	Customer Charge	Energy Charge	Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV	--100	3.02%	5.02%				
Rate 10	LV	> 100	3.02%	5.02%				
Rate 20	LV		3.02%	4.62%				
Rate 40A	LV							
Rate 40	LV - Std		3.02%	4.46%	3.30%			
Rate 40	LV - TOU		3.02%	4.46%		3.30%	3.30%	3.30%
Rate 50	MV - Std		3.02%	4.46%	3.30%			
Rate 50	MV - TOU		3.02%	4.46%		3.30%	3.30%	3.30%
Rate 70	MV -STD		3.02%	-30.48%	-1.98%			
Rate 70	MV -TOU		3.02%	-30.48%		-1.98%	-1.98%	-1.98%
Rate 60	LV		3.02%	3.02%				

The adjustment to each revenue item in the revenue basket is weighted such that the sum of the weights does not exceed the total effective change of 3.02% as shown in the revenue basket of weights in Table 5.4 below.

Table 5.4 Total Non-Fuel Revenue Basket of Weights

		Block/Rate Option	Customer Charge	Energy Charge	Demand-J$/KVA				
					Std.	Off-Peak	Part Peak	On-Peak	
Weighted increase									TOTAL
Rate 10	LV	--100	0.072%	0.511%	0.000%	0.000%	0.000%	0.000%	0.582%
Rate 10	LV	> 100	0.113%	1.272%	0.000%	0.000%	0.000%	0.000%	1.386%
Rate 20	LV		0.047%	1.083%	0.000%	0.000%	0.000%	0.000%	1.130%
Rate 40A	LV		0.000%	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Rate 40	LV - Std		0.009%	0.345%	0.269%	0.000%	0.000%	0.000%	0.623%
Rate 40	LV - TOU		0.001%	0.060%	0.000%	0.002%	0.016%	0.017%	0.095%
Rate 50	MV - Std		0.001%	0.092%	0.061%	0.000%	0.000%	0.000%	0.153%
Rate 50	MV - TOU		0.000%	0.024%	0.000%	0.001%	0.007%	0.007%	0.039%
Rate 70	MV -STD		0.000%	-0.878%	-0.047%	0.000%	0.000%	0.000%	-0.924%
Rate 70	MV -TOU		0.000%	-0.163%	0.000%	0.000%	-0.005%	-0.004%	-0.172%
Rate 60	LV		0.001%	0.107%	0.000%	0.000%	0.000%	0.000%	0.108%
TOTAL			0.243%	2.453%	0.284%	0.002%	0.019%	0.020%	3.02%

Table 5.5 below shows the base year non-fuel basket of revenues that was approved by the Office in the 2014-2019 Tariff Determination Notice.

Table 5.5 Non-Fuel Base Year$_{2014}$ Revenue Basket

		Block/ Rate Option (kWh)	12 Months Test Year Customer Revenue (J$)	Energy Revenue (J$)	Demand (KVA) revenue (J$)				Total Demand Revenue (J$)	Total Revenue (J$)
					Std.	Off-Peak	Part Peak	On-Peak		
Rate 10	LV	≤ 100	1,054,796,940	4,191,406,198	-	-	-	-		5,246,203,138
Rate 10	LV	>100	1,498,171,800	9,561,808,060	-	-	-	-		11,059,979,860
Rate 20	LV		661,657,920	10,600,519,280	-	-	-	-		11,262,177,200
Rate 40	LV - Std		119,114,400	3,267,765,943	3,624,517,296	-	-	-	3,624,517,296	7,011,397,639
Rate 40	LV - TOU		9,002,400	613,795,614	-	24,907,919	248,664,055	255,306,166	528,878,140	1,151,676,154
Rate 50	MV - Std		7,737,600	2,007,252,136	1,215,921,562	-	-	-	1,215,921,562	3,230,911,298
Rate 50	MV - TOU		2,008,800	516,756,352	-	38,607,274	366,976,668	391,469,455	797,053,397	1,315,818,549
Rate 60	LV		7,080,000	1,227,665,631	-	-	-	-		1,234,745,631
TOTAL			**3,359,569,860**	**31,986,969,214**	**4,840,438,858**	**63,515,193**	**615,640,723**	**646,775,621**	**6,166,370,395**	**41,512,909,469**

The Licence stipulates that for each year of the rate review period, the revenue cap parameter (RC_y) will be established without factoring inflation. During the annual adjustments, the inflation between the base year and the current adjustment period would be factored in through the dI parameter.

The approved revenue cap for 2017 (RC_{2017}) is derived as follows:

RC_{2017} = (Revenue Requirement approved in 2014−2019 Tariff Determination Notice) × $(1 - X)^3$

Where: X represents the productivity efficiency factor

In the 2014-2019 Determination Notice the productivity efficiency factor (X-factor) was set at 1.10%. The factor (1-X) is cubed to account for the three adjustment periods from the establishment of the revenue cap (that is, for the periods; 2015-2016, 2016-2017 and 2017-2018 adjustment periods).

Hence,

RC_{2017} = $41,512,909,469 x 0.9674 = $40,157,997,388.98

JPS' arguments pertaining to the use of the abovementioned formula are outlined in the preceding section 3.1.2.

OUR's Position on the Adjustment

JPS did not provide the OUR with details of its investment plans for 2017 and 2019 as requested. By its own admission, the company is not ready for some aspects of the revenue cap regime, at this time. Furthermore, JPS' proposal that revenues be adjusted after the actual investments have taken place is incompatible with the forward looking approach. The OUR therefore takes the view that JPS' efforts to accelerate this aspect of the revenue cap transition was premature and in this regard rejects the JPS proposed adjustments to the tariff. Further details on this decision is outlined in the preceding Section 4.3 of this Determination Notice.

Table 5.6 below shows the actual basket of revenues that was collected by JPS for 2016 on which the annual adjustment rate of 3.02% is applied.

Table 5.6 Actual Revenues Collected: 2016

Class		Block/Rate Option	Customer Charge	Energy-J$/kWh	Demand-J$/KVA				Total Revenue
					Std.	Off-Peak	Part Peak	On-Peak	
Rate 10	LV	--100	1,111,313,583	4,767,199,582	0	0	0	0	5,878,513,165
Rate 10	LV	> 100	1,761,219,804	11,876,154,274	0	0	0	0	13,637,374,078
Rate 20	LV		734,817,486	10,981,035,454	-	-	-	-	11,715,852,940
Rate 40A			-	-	-	-	-	-	-
Rate 40	LV - Std		134,471,510	3,629,175,655	3,820,537,077	-	-	-	7,584,184,243
Rate 40	LV - TOU		9,460,714	630,732,761	-	22,843,073	230,779,855	234,570,487	1,128,386,890
Rate 50	MV - Std		8,813,827	965,577,473	863,470,534	-	-	-	1,837,861,834
Rate 50	MV - TOU		1,536,355	250,082,851	-	11,756,543	103,240,435	102,422,521	469,038,706
Rate 70	MV -STD		1,940,659	1,350,103,157	1,100,422,034	-	-	-	2,452,465,851
Rate 70	MV -TOU		404,304	250,622,777	-	11,439,429	110,411,104	95,299,555	468,177,169
Rate 60	LV		14,118,052	1,662,706,908	-	-	-	-	1,676,824,960
TOTAL			3,778,096,295	36,363,390,892	5,784,429,645	46,039,045	444,431,394	432,292,564	46,848,679,836

Table 5.7 below shows the approved annual revenue target for 2017 after applying the effective increase of 3.02% on actual revenues collected for 2016.

Table 5.7 Approved Annual Revenue Target: 2017

Class		Block/Rate Option	Customer Charge	Energy-J$/kWh	Demand-J$/KVA				Total Revenue
					Std.	Off-Peak	Part Peak	On-Peak	
									0
Rate 10	LV	--100	1,144,863,424	5,006,462,258	0	0	0	0	6,151,325,682
Rate 10	LV	> 100	1,814,389,896	12,472,210,805	0	0	0	0	14,286,600,701
Rate 20	LV		757,001,152	11,488,242,407	-	-	-	-	12,245,243,560
Rate 40A			-	-	-	-	-	-	-
Rate 40	LV - Std		138,531,119	3,790,944,729	3,946,711,179	-	-	-	7,876,187,027
Rate 40	LV - TOU		9,746,326	658,847,425	-	23,597,471	238,401,412	242,317,231	1,172,909,865
Rate 50	MV - Std		9,079,911	1,008,617,708	891,986,844	-	-	-	1,909,684,463
Rate 50	MV - TOU		1,582,737	261,230,195	-	12,144,806	106,649,974	105,805,048	487,412,760
Rate 70	MV -STD		1,999,246	938,083,802	1,078,621,965	-	-	-	2,018,705,013
Rate 70	MV -TOU		416,510	174,230,287	-	11,212,806	108,223,789	93,411,610	387,495,002
Rate 60	LV		14,544,266	1,712,902,958	-	-	-	-	3,539,782,385
TOTAL			**3,892,154,588**	**37,511,772,576**	**5,917,319,987**	**46,955,083**	**453,275,175**	**441,533,889**	**48,263,011,298**

Table 5.8 below shows the actual 2016 billing determinants (extracted from JPS Customer Information System) as presented by the JPS. These billing determinants were accepted and approved by the OUR to be the target billing determinants for 2017. The billing determinants were applied to the approved revenue requirement to derive the tariffs for 2017-2018 period.

Table 5.8 Actual Billing Determinants: 2016

Class		Block/ Rate Option	Average 2016 Customer	Energy kWh Std.	Demand-KVA Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV	<100	215,717	522,146,723	-	-	-	-
Rate 10	LV	>100	341,870	558,614,971	-	-	-	-
Rate 20	LV		64,025	623,568,169	-	-	-	-
Rate 40	LV - STD		1,663	661,052,032	2,220,365	-	-	-
Rate 40	LV - TOU		117	114,887,570	-	314,816	304,817	241,975
Rate 50	MV -STD		109	182,528,823	560,146	-	-	-
Rate 50	MV -TOU		19	47,274,641	-	171,029	153,913	119,012
Rate 70	MV -STD		24	254,944,388	711,676			
Rate 70	MV -TOU		5	47,350,816		165,271	161,994	108,837
Rate 60	STREETLIGHTS		433	71,299,610	-	-	-	-
TOTAL			**623,982**	**3,083,667,744**	**3,492,187**	**651,116**	**620,724**	**469,824**

Table 5.9 below shows the approved non-fuel tariffs 2017-2018 for each rate category. These rates were derived by applying the billing determinants in Table 5.8 above to the approved revenue target in table 5.7 above.

Table 5.9 Approved Non-Fuel Tariffs: 2016-2017

Class		Energy-J$/kWh Block Rate Option	Customer Charge J$/Mth	Energy Charge J$/kWh	Demand-J$/KVA Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV	--100	442.27	9.59	-	-	-	-
Rate 10	LV	> 100	442.27	22.33	-	-	-	-
Rate 20	LV		985.29	18.42	-	-	-	-
Rate 40	LV							
Rate 40	LV - Std		6,941.83	5.73	1,777.51	-	-	-
Rate 40	LV - TOU		6,941.83	5.73	-	74.96	782.11	1,001.41
Rate 50	MV - Std		6,941.83	5.53	1,592.42	-	-	-
Rate 50	MV - TOU		6,941.83	5.53	-	71.01	692.92	889.03
Rate 70	MV -STD		6,941.83	3.68	1,515.61	-	-	-
Rate 70	MV -TOU		6,941.83	3.68	-	67.85	668.07	858.27
Rate 60	LV		2,799.13	24.02	-	-	-	-

Tables 5.10 and 5.11 below show the overall estimated bill impact[14] of the combination of the non-fuel tariff adjustment and the revised fuel rate (adjusted for full pass through of system losses and revised heat rate target). The impact was estimated with the use of billing information for 2017 June.

With the OUR determined rates the typical residential and small commercial customers (Rate 10 and Rate 20) would have seen a reduction of 1.6% on average in the total balance on their bills while the typical large commercial customers (Rate 40 and Rate 50) would have seen a reduction of 2.1%. On the other hand, with the JPS proposed rates residential and small commercial customers would have seen on the average a 2.7% increase while the typical larger commercial customer would have seen a 1.6 % increase in the total balance on their bills.

With the approved wholesale tariff (Rate 70), for customers whose peak demand at a single location is at or above 2MVA, these customers will see a reduction in their bills by an average of 10%. The JPS proposal was for an average reduction of 20%.

[14] The bill impact was estimated on data received from JPS for May 2016 billing for electricity consumed in April 2016.

Table 5.10 Estimated Bill Impact of OUR's Determined Annual Tariff Adjustment

Customer Class	Overall Bill Impact of the OUR Approved Rates			
	Typical Usage (kWh)	Demand (kVA)	Total Bill Impact (%)	Average Change (%)
RT 10 LV Res. Service < 100 kWh	90	n/a	-1.8%	**-1.6%**
RT 10 LV Res. Service 101-150 kWh	150	n/a	-1.6%	
RT 10 LV Res. Service > 150 kWh	200	n/a	-1.5%	
RT 20 LV Gen. Service < 100 kWh	90	n/a	-1.8%	**-1.6%**
RT 20 LV Gen. Service 100-1000 kWh	1,000	n/a	-1.6%	
RT 20 LV Gen. Service 1000-7500 kWh	5,000	n/a	-1.6%	
RT 20 LV Gen. Service > 7500 kWh	8,000	n/a	-1.6%	
RT 40 LV Power Service (Std)	35,000	100	-2.1%	**-2.1%**
RT 50 MV Power Service (Std)	500,000	1,500	-2.1%	
RT 50 MV Power Service (TOU-Partial Peak)	500,000	1,500	-2.1%	
RT 70 Power Service (Std) *NEW	500,000	2,000	-9.5%	**-9.8%**
RT 70 Power Service (TOU-Partial Peak) *NEW	500,000	2,000	-10.0%	
Efficiency Targets:	**System Losses Target**		**JPS Thermal Heat Rate Target**	
	Full Pass Through on Fuel		11,450 kJ/kWh	

Table 5.11 Estimated Bill Impact of JPS' Proposed Annual Tariff Adjustment

Customer Class	Overall Bill Impact of the JPS Proposal			
	Typical Usage (kWh)	Demand (kVA)	Total Bill Impact (%)	Average Change (%)
RT 10 LV Res. Service < 100 kWh	90	n/a	3.2%	**3.1%**
RT 10 LV Res. Service 101-150 kWh	150	n/a	3.1%	
RT 10 LV Res. Service > 150 kWh	200	n/a	3.1%	
RT 20 LV Gen. Service < 100 kWh	90	n/a	4.8%	**3.2%**
RT 20 LV Gen. Service 100-1000 kWh	1,000	n/a	2.8%	
RT 20 LV Gen. Service 1000-7500 kWh	5,000	n/a	2.6%	
RT 20 LV Gen. Service > 7500 kWh	8,000	n/a	2.6%	
RT 40 LV Power Service (Std)	35,000	100	2.0%	**1.6%**
RT 50 MV Power Service (Std)	500,000	1,500	1.5%	
RT 50 MV Power Service (Std)	500,000	1,500	1.3%	
RT 70 Power Service (Std) *NEW	500,000	2,000	-23.0%	**-20.4%**
RT 70 Power Service (TOU-Partial Peak) *NEW	500,000	2,000	-17.8%	
Efficiency Targets:	**System Losses Target**		**JPS Thermal Heat Rate Target**	
	Full Pass Through on Fuel		11,720 kJ/kWh	

6. Appendix

6.1 Appendix 1: U.S. and Jamaican Consumer Price Indices

6.1.1 U.S. Consumer Price Index

U.S. Consumer Price Index - All Urban Consumers

Series Id: CUUR0000SA0
Not Seasonally Adjusted
Area: U.S. city average
Item: All items
Base Period: 1982-84=100

The Consumer Price Index (CPI-U) is compiled by the Bureau of Labor Statistics and is based upon a 1982 Base of 100. A Consumer Price Index of 168 indicates 68% inflation since 1982. The commonly quoted inflation rate of say 3% is actually the change in the Consumer Price Index from a year earlier.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	HALF1	HALF2
2000	168.8	169.8	171.2	171.3	171.5	172.4	172.8	172.8	173.7	174.0	174.1	174.0	172.2	170.8	173.6
2001	175.1	175.8	176.2	176.9	177.7	178.0	177.5	177.5	178.3	177.7	177.4	176.7	177.1	176.6	177.5
2002	177.1	177.8	178.8	179.8	179.8	179.9	180.1	180.7	181.0	181.3	181.3	180.9	179.9	178.9	180.9
2003	181.7	183.1	184.2	183.8	183.5	183.7	183.9	184.6	185.2	185.0	184.5	184.3	184.0	183.3	184.6
2004	185.2	186.2	187.4	188.0	189.1	189.7	189.4	189.5	189.9	190.9	191.0	190.3	188.9	187.6	190.2
2005	190.7	191.8	193.3	194.6	194.4	194.5	195.4	196.4	198.8	199.2	197.6	196.8	195.3	193.2	197.4
2006	198.3	198.7	199.8	201.5	202.5	202.9	203.5	203.9	202.9	201.8	201.5	201.8	201.6	200.6	202.6
2007	202.4	203.5	205.4	206.7	207.9	208.4	208.3	207.9	208.5	208.9	210.2	210.0	207.3	205.7	209.0
2008	211.1	211.7	213.5	214.8	216.6	218.8	220.0	219.1	218.8	216.6	212.4	210.2	215.3	214.4	216.2
2009	211.1	212.2	212.7	213.2	213.9	215.7	215.4	215.8	216.0	216.2	216.3	215.9	214.5	213.1	215.9
2010	216.7	216.7	217.6	218.0	218.2	218.0	218.0	218.3	218.4	218.7	218.8	219.2	218.1	217.5	218.6
2011	220.2	221.3	223.5	224.9	226.0	225.7	225.9	226.5	226.9	226.4	226.2	225.7	224.9	223.6	226.3
2012	226.7	227.7	229.4	230.1	229.8	229.5	229.1	230.4	231.4	231.3	230.2	229.6	229.6	228.8	230.3
2013	230.3	232.2	232.8	232.5	232.9	233.5	233.6	233.9	234.1	233.5	233.1	233.0	233.0	232.4	233.5
2014	233.9	234.8	**236.3**	237.1	237.9	238.3	238.3	237.9	238.0	237.4	236.2	234.8	236.7	236.4	237.1
2015	233.7	234.7	236.1	236.6	237.8	238.6	238.7	238.3	237.9	237.8	237.3	236.5	237.0	236.3	237.8
2016	236.9	237.1	238.1	239.3	240.2	241.0	240.6	240.9	241.4	241.7	241.4	241.4	240.0	238.8	241.2
2017	242.8	243.6	**243.8**												

Source: United States Department of Labour Bureau of Labor Statistics Bureau of Labor Statistics Data

6.1.2 Jamaican Consumer Price Index

Ja. Consumer Price Index

The Index numbers listed in the table: Consumer Price Index for 2007-2011, are based on the revised calculations using the new series that have been derived by using data from the HES conducted between June 2004 and March 2005. For the years prior to 2007 the data is linked to the 1988 series of the CPI using a link factor.

These index numbers provide an historical series of the CPI on a monthly basis. The monthly indexes are given for the 12 months of the calendar year while the arithmetic mean of the data for the 12 months is used to arrive at an annual average index. The Percentage Changes calculated from these averages represent average annual changes for the year.

Consumer Price Index for 2003-2017

Month	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
January	64.80	74.60	84.10	94.70	101.00	119.40	136.00	152.60	167.80	178.90	193.80	211.80	223.00	231.30	237.30
February	64.40	75.00	84.50	94.80	101.30	121.50	137.10	155.90	167.10	180.30	195.00	211.90	221.50	229.60	237.80
March	64.70	75.40	85.30	94.90	102.50	122.90	138.20	156.60	168.90	181.20	197.70	**214.20**	222.70	229.30	**238.70**
April	65.70	75.70	86.90	96.00	102.90	124.80	138.80	158.70	169.70	181.90	198.50	213.60	223.10	228.40	
May	66.80	76.20	88.70	96.30	104.30	127.80	140.00	159.70	171.00	182.80	199.60	215.70	224.20	229.00	
June	68.50	76.80	90.00	97.60	105.10	130.30	142.00	160.70	172.30	183.80	199.90	215.90	225.30	231.00	
July	69.50	77.60	91.40	98.90	106.10	134.00	143.30	161.30	173.60	183.20	200.90	218.90	227.20	232.10	
August	70.40	78.60	91.50	99.20	107.20	135.60	143.90	162.00	174.60	184.10	201.60	221.30	229.00	233.10	
September	71.50	79.00	93.80	99.90	108.90	136.50	146.30	162.80	175.91	187.60	207.20	225.90	230.00	234.20	
October	72.70	81.60	94.30	99.80	110.40	136.90	147.50	164.00	176.70	189.40	209.00	226.10	230.70	234.80	
November	73.40	83.60	94.60	99.60	114.00	136.40	148.70	165.70	177.50	190.60	209.50	224.90	231.80	235.60	
December	73.90	84.10	94.60	100.00	116.80	136.50	150.40	168.10	178.20	192.50	210.70	224.10	232.30	236.30	
Annual Average	**68.90**	**78.20**	**90.00**	**97.60**	**106.70**	**130.20**	**142.70**	**160.68**	**172.78**	**184.69**	**201.95**	**218.69**	**226.73**	**232.06**	**237.93**
Annual Inflation Rate	**13.80**	**13.70**	**12.60**	**5.70**	**16.80**	**16.80**	**10.20**	**11.80**	**6.00**	**8.00**	**9.45**	**6.36**	**3.66**	**5.44**	**-100.00**

The Consumer Price Index (CPI) is one in a series of economic indicators produced by the Statistical Institute of Jamaica as part of its objective to provide an integrated set of statistical information on the social and economic conditions of the people of Jamaica.

Source: Statistical Institute of Jamaica http://statinja.gov.jm/Trade-Econ%20Statistics/CPI/NewCPI.aspx

6.2 Appendix 2: Estimated Bill Impact of OUR's Approved Annual Tariff Adjustment

6.2.1 Bill Comparison for a Typical Rate 10 Consumer with consumption < 100 kWh

Usage 90 kWh

Rate 10	June 2017 Bill - Before			June 2017 Bill - After				
Below 100kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy 1st	90	9.13	821.65	90	9.59	862.94	41.29	5.03%
Energy 2nd	0	21.26	-	0	22.33	-	-	
Customer Charge			429.31			442.27	12.96	3.02%
Sub Total			**1,250.96**			**1,305.21**	**54.25**	**4.34%**
EEIF	90	0.2499	**22.49**	90	0	**-**		
F/E Adjust		0.050	63.57		-0.005	- 6.82		
Fuel & IPP	90	17.033	1,533.00	90	16.894	1,520.46	- **12.53**	**-0.82%**
Bill Total			**J$ 2,870.02**			**J$ 2,818.85**	- **51.16**	**-1.78%**

6.2.2 Bill Comparison for a Typical Rate 10 Consumer with consumption 101kWh </= 150kWh

Usage 150 kWh

Rate 10	June 2017 Bill - Before			June 2017 Bill - After				
101 < /=150kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy 1st	100	9.13	912.94	100	9.59	958.82	45.88	5.03%
Energy 2nd	50	21.26	1,062.98	50	22.33	1,116.35	53.37	5.02%
Customer Charge			429.31			442.27	12.96	3.02%
Sub Total			**2,405.23**			**2,517.44**	**112.21**	**4.67%**
EEIF	150	0.2499	**37.49**	150	0	**-**		
F/E Adjust		0.050	121.95		-0.005	- 13.16		
Fuel & IPP	150	17.033	2,554.99	150	16.894	2,534.10	- **20.89**	**-0.82%**
Bill Total			**J$ 5,119.66**			**J$ 5,038.39**	- **81.26**	**-1.59%**

6.2.3 Bill Comparison for a Typical Rate 10 Consumer with consumption 150kWh and above

Usage 200 kWh

Rate 10	June 2017 Bill - Before			June 2017 Bill - After				
Above 150kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy 1st	100	9.13	912.94	100	9.59	958.82	45.88	5.03%
Energy 2nd	100	21.26	2,125.96	100	22.33	2,232.70	106.74	5.02%
Customer Charge			429.31			442.27	12.96	3.02%
Sub Total			**3,468.21**			**3,633.80**	**165.58**	**4.77%**
EEIF	200	0.2499	**49.98**	200	0	-		
F/E Adjust		0.050	175.64		-0.005	- 18.99		
Fuel & IPP	200	17.033	3,406.66	200	16.894	3,378.81		
Bill Sub-Total			**7,100.49**	**Bill Sub-Total**		**6,993.61**		
GCT @16.5%		0.165	326.84		0.165	322.61	- **4.23**	**-1.29%**
Bill Total			**J$ 7,427.32**			**J$ 7,316.22**	- **111.10**	**-1.50%**

6.2.4 Bill Comparison for a Typical Rate 20 Consumer with consumption ≤ 100 kWh

Usage 90 kWh

Rate 20	June 2017 Bill - Before			June 2017 Bill - After				
Below 100kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy	90	17.61	1,585.09	90	18.42	1,658.11	73.02	4.61%
Customer Charge			956.42			985.29	28.88	3.02%
Sub Total			**2,541.51**			**2,643.40**	**101.89**	**4.01%**
EEIF		0.2499	**22.49**	90	0	-		
F/E Adjust		0.050	128.00		-0.005	- 13.81		
Fuel & IPP	90	17.033	1,533.00	90	16.894	1,520.46	- **12.53**	**-0.82%**
Bill Sub-Total			**4,224.99**			**4,150.05**	- **74.94**	**-1.77%**
GCT @16.5%		0.165	697.12		0.165	684.76		
Bill Total			**J$ 4,922.12**			**J$ 4,834.81**	- **87.31**	**-1.77%**

6.2.5 Bill Comparison for a Typical Rate 20 Consumer with consumption 101kWh - 1000kWh

Usage 1000 kWh

Rate 20	June 2017 Bill - Before			June 2017 Bill - After				
101 - 1000kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		**131.00**	130.14			
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy	1000	17.61	17,612.09	1000	18.42	18,423.39	811.30	4.61%
Customer Charge			956.42			985.29	28.88	3.02%
Sub Total			**18,568.51**			**19,408.69**	**840.17**	**4.52%**
EEIF		0.2499	**249.90**	1000	0	-		
F/E Adjust		0.050	939.45		-0.005	- 101.42		
Fuel & IPP	1000	17.033	17,033.29	1000	16.894	16,894.03	- 139.25	-0.82%
Bill Sub-Total			**36,791.15**			**36,201.30**	**- 589.85**	**-1.60%**
GCT @16.5%		0.165	6,070.54		0.165	5,973.21	- 97.33	-1.60%
Bill Total			**J$ 42,861.69**			**J$ 42,174.51**	**- 687.18**	**-1.60%**

6.2.6 Bill Comparison for a Typical Rate 20 Consumer with consumption 1001kWh - 7500kWh

Usage 5000 kWh

Rate 20	June 2017 Bill - Before			June 2017 Bill - After				
1001 - 7500kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		**131.00**	130.14			
		.						
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy	5000	17.61	88,060.47	5000	18.42	92,116.97	4,056.50	4.61%
Customer Charge			956.42			985.29	28.88	3.02%
Sub Total			**89,016.89**			**93,102.27**	**4,085.37**	**4.59%**
EEIF		0.2499	**1,249.50**	5000	0	-		
F/E Adjust		0.050	4,506.28		-0.005	- 486.52		
Fuel & IPP	5000	17.033	85,166.43	5000	16.894	84,470.16	- 696.27	-0.82%
Bill Sub-Total			**179,939.10**			**177,085.90**	**- 2,853.19**	**-1.59%**
GCT @16.5%		0.165	29,689.95		0.165	29,219.17	- 470.78	-1.59%
Bill Total			**J$ 209,629.05**			**J$ 206,305.08**	**- 3,323.97**	**-1.59%**

6.2.7 Bill Comparison for a Typical Rate 20 Consumer with consumption above 7500kWh

Usage above 7500 kWh

Rate 20	June 2017 Bill - Before			June 2017 Bill - After				
Above 7500kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
		.						
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy	8000	17.61	140,896.76	8000	18.42	147,387.16	6,490.40	4.61%
Customer Charge			956.42			985.29	28.88	3.02%
Sub Total			**141,853.18**			**148,372.45**	**6,519.27**	**4.60%**
EEIF		0.2499	**1,999.20**	8000	0	-		
F/E Adjust		0.050	7,181.39		-0.005	- 775.34		
Fuel & IPP	8000	17.033	136,266.29	8000	16.894	135,152.25	- 1,114.04	-0.82%
Bill Sub-Total			**287,300.06**			**282,749.36**	**- 4,550.70**	**-1.58%**
GCT @16.5%		0.165	47,404.51		0.165	46,653.64	- 750.87	-1.58%
Bill Total			**J$ 334,704.57**			**J$ 329,403.00**	**- 5,301.56**	**-1.58%**

6.2.8 Bill Comparison for a Typical Rate 40 Consumer

Usage 35,000 kWh

Demand 100 kVA

Rate 40	June 2017 Bill - Before			June 2017 Bill - After				
Standard	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage	Rate (J$)		Usage	Rate (J$)			
Energy kWh	35000	5.49	192,237.98	35000	5.73	200,715.01	8,477.03	4.41%
Demand kVA	100	1720.68	172,068.37	100	1777.51	177,750.58	5,682.22	
Customer Charge			6,738.40			6,941.83	203.43	3.02%
Sub Total			**371,044.75**			**385,407.42**	**14,362.68**	**3.87%**
EEIF		0.2499	**8,746.50**	35000	0	-		
F/E Adjust		0.050	18,959.92		-0.005	- 2,014.00		
Fuel & IPP	35000	16.352	572,318.41	35000	16.218	567,639.46	- 4,678.95	-0.82%
Bill Sub-Total			**971,069.58**			**951,032.88**	**- 20,036.70**	**-2.06%**
GCT @16.5%		0.165	160,226.48		0.165	156,920.43	- 3,306.06	-2.06%
Bill Total			**J$ 1,131,296.06**			**J$ 1,107,953.31**	**- 23,342.75**	**-2.06%**

6.2.9 Bill Comparison for a Typical Rate 50 Customer

Usage 500,000 kWh

Demand 1,500 kVA

Rate 50	June 2017 Bill - Before			June 2017 Bill - After				
Standard	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage	Rate (J$)		Usage	Rate (J$)			
Energy kWh	500000	5.29	2,645,525.40	500000	5.53	2,762,899.83	117,374.43	4.44%
Demand kVA	1500	1541.51	2,312,263.42	1500	1592.42	2,388,628.07	76,364.65	3.30%
Customer Charge			6,738.40			6,941.83	203.43	3.02%
Sub Total			**4,964,527.23**			**5,158,469.74**	**193,942.51**	**3.91%**
EEIF		0.2499	**124,950.00**	500000	0	-		
F/E Adjust		0.050	254,076.67		-0.005	- 26,956.35		
Fuel & IPP	500000	16.352	8,175,977.27	500000	16.218	8,109,135.16	- 66,842.11	-0.82%
Bill Sub-Total			**13,519,531.17**			**13,240,648.54**	**- 278,882.63**	**-2.06%**
GCT @16.5%		0.165	2,230,722.64		0.165	2,184,707.01	- 46,015.63	-2.06%
Bill Total			**J$ 15,750,253.82**			**J$ 15,425,355.55**	**- 324,898.26**	**-2.06%**

6.2.10 Bill Comparison for a Typical Rate 50 TOU Customer (Partial Peak)

Usage 500,000 kWh

Demand 1,500 kVA

Rate 50	June 2017 Bill - Before			June 2017 Bill - After				
TOU (Partial Peak)	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage	Rate (J$)		Usage	Rate (J$)			
Energy kWh	500000	5.29	2,645,525.40	500000	5.53	2,762,899.83	117,374.43	4.44%
Demand kVA	1500	670.77	1,006,147.92	1500	692.92	1,039,383.50	33,235.58	3.30%
Customer Charge			6,738.40			6,941.83	203.43	3.02%
Sub Total			**3,658,411.72**			**3,809,225.16**	**150,813.44**	**4.12%**
EEIF		0.2499	**124,950.00**	500000	0	-		
F/E Adjust		0.050	188,872.83		-0.005	- 19,905.67		
Fuel & IPP	500000	15.708	7,854,069.35	500000	15.580	7,789,858.97	- 64,210.38	-0.82%
Bill Sub-Total			**11,826,303.90**			**11,579,178.45**	**- 247,125.44**	**-2.09%**
GCT @16.5%		0.165	1,951,340.14		0.165	1,910,564.44	- 40,775.70	-2.09%
Bill Total			**J$ 13,777,644.04**			**J$ 13,489,742.90**	**- 287,901.14**	**-2.09%**

6.2.11 Bill Comparison for a Typical Rate 70 Customer (NEW)

Usage 500,000 kWh

Demand 2,000 kVA

Rate 70 (NEW)	June 2017 Bill - Before			June 2017 Bill - After				
Standard	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage	Rate (J$)		Usage	Rate (J$)			
Energy kWh	500000	5.29	2,645,525.40	500000	3.68	1,839,781.23	- 805,744.17	-30.46%
Demand kVA	2000	1541.51	3,083,017.90	2000	1515.61	3,031,214.60	- 51,803.30	-1.68%
Customer Charge			6,738.40			6,941.83	203.43	3.02%
Sub Total			**5,735,281.70**			**4,877,937.66**	**- 857,344.04**	**-14.95%**
EEIF		0.2499	**124,950.00**	500000	0	-		
F/E Adjust		0.050	292,554.25		-0.005	- 25,490.39		
Fuel & IPP	500000	16.352	8,175,977.27	500000	16.218	8,109,135.16	- 66,842.11	-0.82%
Bill Sub-Total			**14,328,763.22**			**12,961,582.43**	**- 1,367,180.79**	**-9.54%**
GCT @16.5%		0.165	2,364,245.93		0.165	2,138,661.10	- 225,584.83	-9.54%
Bill Total			**J$ 16,693,009.15**			**J$ 15,100,243.53**	**- 1,592,765.62**	**-9.54%**

6.2.12 Bill Comparison for a Typical Rate 50 TOU Customer (Partial Peak) (New)

Usage 500,000 kWh

Demand 2,000 kVA

Rate 70 (NEW)	June 2017 Bill - Before			June 2017 Bill - After				
TOU (Partial Peak)	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage	Rate (J$)		Usage	Rate (J$)			
Energy kWh	500000	5.29	2,645,525.40	500000	3.68	1,839,781.23	- 805,744.17	-30.46%
Demand kVA	2000	670.77	1,341,530.56	2000	668.07	1,336,147.76	- 5,382.79	-0.40%
Customer Charge			6,738.40			6,941.83	203.43	3.02%
Sub Total			**3,993,794.36**			**3,182,870.82**	**- 810,923.54**	**-20.30%**
EEIF		0.2499	**124,950.00**	500000	0	-		
F/E Adjust		0.050	205,615.79		-0.005	- 16,632.57		
Fuel & IPP	500000	15.708	7,854,069.35	500000	15.580	7,789,858.97	- 64,210.38	-0.82%
Bill Sub-Total			**12,178,429.49**			**10,956,097.23**	**- 1,222,332.27**	**-10.04%**
GCT @16.5%		0.165	2,009,440.87		0.165	1,807,756.04	- 201,684.82	-10.04%
Bill Total			**J$ 14,187,870.36**			**J$ 12,763,853.27**	**- 1,424,017.09**	**-10.04%**

6.3 Appendix 3: Estimated Bill Impact of JPS Proposed Annual Tariff Adjustment

6.3.1 Bill Comparison for a Typical Rate 10 Consumer with consumption < 100 kWh

Usage 90 kWh

Rate 10	June 2017 Bill - Before			June 2017 Bill - After				
Below 100kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy 1st	90	9.13	821.65	90	10.24	921.42	99.77	12.14%
Energy 2nd	0	21.26	-	0	23.84	-	-	
Customer Charge			429.31			508.53	79.23	18.45%
Sub Total			**1,250.96**			**1,429.95**	**179.00**	**14.31%**
EEIF	90	0.2499	**22.49**	90	0	-		
F/E Adjust		0.050	63.57		-0.005	- 7.47		
Fuel & IPP	90	17.033	1,533.00	90	17.115	1,540.37		
Bill Total			**J$ 2,870.02**			**J$ 2,962.85**	**92.84**	**3.23%**

6.3.2 Bill Comparison for a Typical Rate 10 Consumer with consumption 101kWh </= 150kWh

Usage 150 kWh

Rate 10	June 2017 Bill - Before			June 2017 Bill - After				
101 < /=150kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy 1st	100	9.13	912.94	100	10.24	1,023.80	110.86	12.14%
Energy 2nd	50	21.26	1,062.98	50	23.84	1,192.00	129.02	12.14%
Customer Charge			429.31			508.53	79.23	18.45%
Sub Total			**2,405.23**			**2,724.34**	**319.10**	**13.27%**
EEIF	150	0.2499	**37.49**	150	0	-		
F/E Adjust		0.050	121.95		-0.005	- 14.24		
Fuel & IPP	150	17.033	2,554.99	150	17.115	2,567.29		
Bill Total			**J$ 5,119.66**			**J$ 5,277.39**	**157.73**	**3.08%**

6.3.3 Bill Comparison for a Typical Rate 10 Consumer with consumption 350kWh and above

Usage 150 kWh

Rate 10	June 2017 Bill - Before			June 2017 Bill - After				
Above 150kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy 1st	100	9.1294484	912.94	100	10.24	1,023.80	110.86	12.14%
Energy 2nd	100	21.26	2,125.96	100	23.84	2,384.01	258.04	12.14%
Customer Charge			429.31			508.53	79.23	18.45%
Sub Total			**3,468.21**			**3,916.34**	**448.13**	**12.92%**
EEIF	200	0.2499	**49.98**	200	0	-		
F/E Adjust		0.050	175.64		-0.005	- 20.47		
Fuel & IPP	200	17.033	3,406.66	200	17.115	3,423.06		
Bill Sub-Total			**7,100.49**	**Bill Sub-Total**		**7,318.93**		
GCT @16.5%		0.165	326.84	GCT @16.5%	0.165	336.85		
Bill Total			**J$ 7,427.32**			**J$ 7,655.78**	**228.46**	**3.08%**

6.3.4 Bill Comparison for a Typical Rate 20 Consumer with consumption ≤ 100 kWh

Usage 90 kWh

Rate 20	June 2017 Bill - Before			June 2017 Bill - After				
Below 100kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy	90	17.61	1,585.09	90	19.68	1,770.93	185.84	11.72%
Customer Charge			956.42			1,132.91	176.49	18.45%
Sub Total			**2,541.51**			**2,903.84**	**362.33**	**14.26%**
EEIF		0.2499	**22.49**	90	0	-		
F/E Adjust		0.050	128.00		-0.005	- 15.17		
Fuel & IPP	90	17.033	1,533.00	90	17.115	1,540.37		
Bill Sub-Total			**4,224.99**			**4,429.04**	**204.04**	**4.83%**
GCT @16.5%		0.165	697.12		0.165	730.79		
Bill Total			**J$ 4,922.12**			**J$ 5,159.83**	**237.71**	**4.83%**

6.3.5 Bill Comparison for a Typical Rate 20 Consumer with consumption 101kWh - 1000kWh

Usage 1000 kWh

Rate 20	June 2017 Bill - Before			June 2017 Bill - After				
101 - 1000kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy	1000	17.612095	17,612.09	1000	19.68	19,676.95	2,064.86	11.72%
Customer Charge			956.42			1,132.91	176.49	18.45%
Sub Total			**18,568.51**			**20,809.87**	**2,241.35**	**12.07%**
EEIF		0.2499	**249.90**	1000	0	-		
F/E Adjust		0.050	939.45		-0.005	- 108.75	- 1,048.20	
Fuel & IPP	1000	17.033	17,033.29	1000	17.115	17,115.28	81.99	0.48%
Bill Sub-Total			**36,791.15**			**37,816.40**	**1,025.25**	**2.79%**
GCT @16.5%		0.165	6,070.54		0.165	6,239.71	169.17	2.79%
Bill Total			**J$ 42,861.69**			**J$ 44,056.10**	**1,194.41**	**2.79%**

6.3.6 Bill Comparison for a Typical Rate 20 Consumer with consumption 1001kWh - 7500kWh

Usage 5000 kWh

Rate 20	June 2017 Bill - Before			June 2017 Bill - After				
1001 - 7500kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy	5000	17.612095	88,060.47	5000	19.68	98,384.77	10,324.30	11.72%
Customer Charge			956.42			1,132.91	176.49	18.45%
Sub Total			**89,016.89**			**99,517.68**	**10,500.79**	**11.80%**
EEIF		0.2499	**1,249.50**	5000	0	-		
F/E Adjust		0.050	4,506.28		-0.005	- 520.04	- 5,026.32	
Fuel & IPP	5000	17.033	85,166.43	5000	17.115	85,576.38	409.95	0.48%
Bill Sub-Total			**179,939.10**			**184,574.02**	**4,634.92**	**2.58%**
GCT @16.5%		0.165	29,689.95		0.165	30,454.71	764.76	2.58%
Bill Total			**J$ 209,629.05**			**J$ 215,028.74**	**5,399.69**	**2.58%**

6.3.7 Bill Comparison for a Typical Rate 20 Consumer with consumption above 7500kWh

Usage above 7500 kWh

Rate 20	June 2017 Bill - Before			June 2017 Bill - After				
Above 7500kWh	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
		.						
	Usage kWh	Rate (J$)		Usage kWh	Rate (J$)			
Energy	8000	17.612095	140,896.76	8000	19.68	157,415.64	16,518.88	11.72%
Customer Charge			956.42			1,132.91	176.49	18.45%
Sub Total			**141,853.18**			**158,548.55**	**16,695.37**	**11.77%**
EEIF		0.2499	**1,999.20**	8000	0	-		
F/E Adjust		0.050	7,181.39		-0.005	- 828.52	- 8,009.91	
Fuel & IPP	8000	17.033	136,266.29	8000	17.115	136,922.22	655.93	0.48%
Bill Sub-Total			**287,300.06**			**294,642.24**	**7,342.18**	**2.56%**
GCT @16.5%		0.165	47,404.51		0.165	48,615.97	1,211.46	2.56%
Bill Total			**J$ 334,704.57**			**J$ 343,258.21**	**8,553.64**	**2.56%**

6.3.8 Bill Comparison for a Typical Rate 40 Consumer

Usage 35,000 kWh

Demand 100 kVA

Rate 40	June 2017 Bill - Before			June 2017 Bill - After				
Standard	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage	Rate (J$)		Usage	Rate (J$)			
Energy kWh	35000	5.49	192,237.98	35000	6.37	223,109.84	30,871.86	16.06%
Demand kVA	100	1720.68	172,068.37	100	1869.24	186,923.67	14,855.31	
Customer Charge			6,738.40			7,981.86	1,243.45	18.45%
Sub Total			**371,044.75**			**418,015.36**	**46,970.62**	**12.66%**
EEIF		0.2499	**8,746.50**	35000	0	-		
F/E Adjust		0.050	18,959.92		-0.005	- 2,184.40	- 21,144.32	
Fuel & IPP	35000	16.352	572,318.41	35000	16.431	575,073.30	2,754.89	0.48%
Bill Sub-Total			**971,069.58**			**990,904.27**	**19,834.69**	**2.04%**
GCT @16.5%		0.165	160,226.48		0.165	163,499.20	3,272.72	2.04%
Bill Total			**J$ 1,131,296.06**			**J$ 1,154,403.47**	**23,107.41**	**2.04%**

6.3.9 Bill Comparison for a Typical Rate 50 Customer

Usage 500,000 kWh

Demand 1,500 kVA

Rate 50	June 2017 Bill - Before			June 2017 Bill - After				
Standard	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage	Rate (J$)		Usage	Rate (J$)			
Energy kWh	500000	5.29	2,645,525.40	500000	6.03	3,013,642.30	368,116.89	13.91%
Demand kVA	1500	1541.51	2,312,263.42	1500	1674.60	2,511,896.82	199,633.40	8.63%
Customer Charge			6,738.40			7,981.86	1,243.45	18.45%
Sub Total			**4,964,527.23**			**5,533,520.97**	**568,993.74**	**11.46%**
EEIF		0.2499	**124,950.00**	500000	0	-		
F/E Adjust		0.050	254,076.67		-0.005	- 28,916.24	- 282,992.91	
Fuel & IPP	500000	16.352	8,175,977.27	500000	16.431	8,215,332.91	39,355.64	0.48%
Bill Sub-Total			**13,519,531.17**			**13,719,937.64**	**200,406.47**	**1.48%**
GCT @16.5%		0.165	2,230,722.64		0.165	2,263,789.71	33,067.07	1.48%
Bill Total			**J$ 15,750,253.82**			**J$ 15,983,727.35**	**233,473.54**	**1.48%**

6.3.10 Bill Comparison for a Typical Rate 50 TOU Customer (Partial Peak)

Usage 500,000 kWh

Demand 1,500 kVA

Rate 50	June 2017 Bill - Before			June 2017 Bill - After				
TOU (Partial Peak)	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage	Rate (J$)		Usage	Rate (J$)			
Energy kWh	500000	5.29	2,645,525.40	500000	6.03	3,013,642.30	368,116.89	13.91%
Demand kVA	1500	670.77	1,006,147.92	1500	728.68	1,093,022.45	86,874.53	8.63%
Customer Charge			6,738.40			7,981.86	1,243.45	18.45%
Sub Total			**3,658,411.72**			**4,114,646.60**	**456,234.88**	**12.47%**
EEIF		0.2499	**124,950.00**	500000	0	-		
F/E Adjust		0.050	188,872.83		-0.005	- 21,501.70	- 210,374.53	
Fuel & IPP	500000	15.708	7,854,069.35	500000	15.784	7,891,875.46	37,806.11	0.48%
Bill Sub-Total			**11,826,303.90**			**11,985,020.35**	**158,716.46**	**1.34%**
GCT @16.5%		0.165	1,951,340.14		0.165	1,977,528.36	26,188.22	1.34%
Bill Total			**J$ 13,777,644.04**			**J$ 13,962,548.71**	**184,904.67**	**1.34%**

6.3.11 Bill Comparison for a Typical Rate 70 Customer (NEW)

Usage 500,000 kWh

Demand 2,000 kVA

Rate 70 (NEW)	June 2017 Bill - Before			June 2017 Bill - After				
Standard	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage	Rate (J$)		Usage	Rate (J$)			
Energy kWh	500000	5.29	2,645,525.40	500000	3.11	1,556,999.15	- 1,088,526.25	-41.15%
Demand kVA	2000	1541.51	3,083,017.90	2000	633.96	1,267,916.22	- 1,815,101.67	-58.87%
Customer Charge			6,738.40			7,981.86	1,243.45	18.45%
Sub Total			**5,735,281.70**			**2,832,897.23**	**- 2,902,384.47**	**-50.61%**
Sub Total		0.2499	**124,950.00**	500000	0	-		
F/E Adjust		0.050	292,554.25		-0.005	- 14,803.73	- 307,357.97	
Fuel & IPP	500000	16.352	8,175,977.27	500000	16.431	8,215,332.91	39,355.64	0.48%
Bill Sub-Total			**14,328,763.22**			**11,033,426.42**	**- 3,295,336.81**	**-23.00%**
GCT @16.5%		0.165	2,364,245.93		0.165	1,820,515.36	- 543,730.57	-23.00%
Bill Total			**J$ 16,693,009.15**			**J$ 12,853,941.77**	**- 3,839,067.38**	**-23.00%**

6.3.12 Bill Comparison for a Typical Rate 50 TOU Customer (Partial Peak) (New)

Usage 500,000 kWh

Demand 2,000 kVA

Rate 70 (NEW)	June 2017 Bill - Before			June 2017 Bill - After				
TOU (Partial Peak)	2016 - 2017 Rates J$			2017 - 2018 Rates J$			Change	
Description	Base F/X Rate	Billing F/X Rate		Base F/X Rate	Billing F/X Rate		J$	%
	122.50	130.14		131.00	130.14			
	Usage	Rate (J$)		Usage	Rate (J$)			
Energy kWh	500000	5.29	2,645,525.40	500000	3.12	1,561,409.67	- 1,084,115.73	-40.98%
Demand kVA	2000	670.77	1,341,530.56	2000	279.45	558,892.61	- 782,637.95	-58.34%
Customer Charge			6,738.40			7,981.86	1,243.45	18.45%
Sub Total			**3,993,794.36**			**2,128,284.13**	**- 1,865,510.23**	**-46.71%**
Sub Total		0.2499	**124,950.00**	500000	0	-		
F/E Adjust		0.050	205,615.79		-0.005	- 11,121.67	- 216,737.45	
Fuel & IPP	500000	15.708	7,854,069.35	500000	15.784	7,891,875.46	37,806.11	0.48%
Bill Sub-Total			**12,178,429.49**			**10,009,037.92**	**- 2,169,391.57**	**-17.81%**
GCT @16.5%		0.165	2,009,440.87		0.165	1,651,491.26	- 357,949.61	-17.81%
Bill Total			**J$ 14,187,870.36**			**J$ 11,660,529.18**	**- 2,527,341.18**	**-17.81%**

6.4 Appendix 4: Fuel Weights

6.4.1 Existing Weights

FUEL & IPP RATE SUMMARY - May 2017				
(To be implemented June 2017)				
BILLING EXCHANGE RATE J$130.1443 = US$1.00				
Fuel Weights Applicable				
Class	Std.	Off Peak	Partial Peak	On Peak
Rate 10				
1st. 100 kWh	1.000			
Over 100 kWh	1.000			
Rate 20	1.000			
Rate 40 LV	0.960	0.800	1.044	1.302
Rate 40A LV	0.960			
Rate 50 MV	0.960	0.800	1.044	1.302
Rate 60	0.960			
Traffic Signal	0.960			
Actual Fuel & IPP Rate for May 2017 [USc/kWh]				13.088
Billing Exchange Rate for May 2017				130.14
Fuel & IPP Rates for May 2017				
Class	Std.	Off Peak	Partial Peak	On Peak
Rate 10				
1st. 100 kWh	17.033			
Over 100 kWh	17.033			
Rate 20	17.033			
Rate 40 LV	16.352	13.627	17.790	22.171
Rate 40A LV	16.352			
Rate 50 MV	16.352	13.627	17.790	22.171
Rate 60	16.352			
Traffic Signal	16.352			

6.4.2 Approved Weights

FUEL & IPP RATE SUMMARY - May 2017				
(To be implemented June 2017)				
BILLING EXCHANGE RATE J$130.1443 = US$1.00				
Fuel Weights Applicable				
Class	Std.	Off Peak	Partial Peak	On Peak
Rate 10				
1st. 100 kWh	1.000			
Over 100 kWh	1.000			
Rate 20	1.000			
Rate 40 LV	0.960	0.800	1.044	1.302
Rate 40A LV	0.960			
Rate 50 MV	0.960	0.800	1.044	1.302
Rate 60	0.960			
Traffic Signal	0.960			
Actual Fuel & IPP Rate for May 2017 [USc/kWh]				13.044
Billing Exchange Rate for May 2017				130.14
Fuel & IPP Rates for May 2017				
Class	Std.	Off Peak	Partial Peak	On Peak
Rate 10				
1st. 100 kWh	16.976			
Over 100 kWh	16.976			
Rate 20	16.976			
Rate 40 LV	16.297	13.581	17.730	22.096
Rate 40A LV	16.297			
Rate 50 MV	16.297	13.581	17.730	22.096
Rate 60	16.297			
Traffic Signal	16.297			