THE JAMAICA PUBLIC SERVICE CO. LTD.

ANNUAL TARIFF ADJUSTMENT

SUBMISSION FOR 2011

April 5, 2011

Preamble

This submission is made in relation to the annual Performance-Based Rate-Making (PBRM) tariff adjustment filing for 2011, in accordance with the All Island Electric Licence 2001 (the Licence), Schedule 3, section 4, which states:

> "The Licensee shall make annual filings to *the Office* at least sixty (60) days prior to the Adjustment Date [June 1, 2011]. These filings shall include the support for the performance indices, the CPI indices, and the proposed Non-Fuel Base Rates for electricity, and other information as may be necessary to support such filings…."

In accordance with the Licence and the OUR's September 18, 2009 Determination Notice, the 2011 annual non-fuel tariff adjustment will incorporate changes in relation to inflation, foreign exchange and the X factor but it will not include any adjustments for the Q factor.

Additionally, there being no natural disasters or other qualifying events under the Z-factor mechanism, so this filing does not contemplate any Z-factor adjustment. However, it is important to note that there are still several disputes which are to be resolved before the Appeal Tribunal. If these matters were to be resolved in favour of JPS then a Z-factor adjustment could be applicable or an additional draw down from the Electricity Disaster Fund.

In relation to the 2011 annual tariff submission, we anticipate that the total bill impact of the increase in non-fuel tariffs will be approximately 0.32% for most customers given that fuel represents just over 60% of the customer's total bill. The result of the annual PBRM adjustment is, a decrease in the base non-fuel rates of 1.70% on average for customers. This is primarily the result of the application of the adjustment of 2.72% for the first time during the 2009 – 2014 rate reset period; which is offset by the allowed weighted average escalation adjustment factor of 1.02%. The complete details of the calculation of the 1.70% decrease in the total non-fuel tariffs is provided in this document, as well as the details of the adjustment to the individual tariffs which comprise the revenue cap. Additionally, this tariff adjustment reflects the resetting of the base foreign exchange rate from J$89: US$1 to J$86.5: US$1.

The submission also includes proposals for the annual reset of the fuel cost related PBRM targets – Heat Rate and System Loss, as well as the supporting data for the setting of the Q factor.

Glossary

ABNF	-	Adjusted Non-fuel base rate
AMI	-	Advanced Metering Infrastructure
CIS	-	Customer Information System
CPI	-	Consumer Price Index
EEIF	-	Electricity Efficiency Improvement Fund
EDF	-	Electricity Disaster Fund
GDP	-	Gross Domestic Product
GEI	-	Government Electrical Inspectorate
GOJ	-	Government of Jamaica
GWh	-	Gigawatt-hours
IPP	-	Independent Power Purchase
kVA	-	Kilo Volt Amperes
kWh	-	Kilowatt-hours
Licence	-	The All Island Electric Licence 2001
MVA	-	Mega Volt Amperes
MW	-	Megawatt
MWh	-	Megawatt-hours
NWC	-	National Water Commission
O&M	-	Operating and Maintenance
OCC	-	Opportunity Cost of Capital
PBRM	-	Performance Based Rate-Making Mechanism
RAMI	-	Residential Advance Metering Infrastructure
REP	-	Rural Electrification Programme Limited
RPD	-	Revenue Protection Department
T&D	-	Transmission & Distribution
TOU	-	Time of Use

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Section 1: PBRM Annual Adjustment

1.1 Overview

According to Exhibit 1 in the Licence:

"The Non-Fuel Base Rate for each customer class shall be adjusted on an annual basis, commencing June 1, 2004, *(Adjustment Date)*, pursuant to the following formula:

$$\mathbf{ABNFy = ABNFy_{-1}\ (1 + dPCI)}$$

Where:

$ABNF_y$	= Adjusted Non-Fuel Base Rate for Year "y"
$ABNF_{y-1}$	= Non-Fuel Base Rate prior to adjustment
dPCI	= Annual rate of change in the non-fuel electricity prices as defined below
PCI	= Non-fuel Electricity Pricing Index

"The annual PBRM filing will follow the general framework where the annual rate of change in non-fuel electricity prices (dPCI) will be determined through the following formula:

$$\mathbf{dPCI = dI \pm X \pm Q \pm Z}$$

Where:

dI	=	the annual growth rate in an inflation and devaluation measure;
X	=	the offset to inflation (annual real price increase or decrease) resulting from productivity changes in the electricity industry;
Q	=	the allowed price adjustment to reflect changes in the quality of service provided to the customers; and
Z	=	the allowed rate of price adjustment for special reasons not captured by the other elements of the formula.

The dPCI above was modified on page 9 of the OUR's September 18, 2009 *Determination Notice (Document No. Ele 2009/04 Det/03)* as follows:

"The price cap will be applied on a global basis. This means the annual price adjustment factor will be applied to the tariff basket. The adjustment in each tariff will be weighted by an associated quantity for each element. The weighted average increase of the tariff basket should not exceed the annual price adjustment.

The base Non-Fuel tariffs shall be adjusted annually, as follows:

b1 = b0 [1 + dPCI].

b0 =Base non-fuel tariff at time period t = 0

b1 = Base non-fuel tariff at time period t = 1"

1.1 Overview (Cont'd)

The OUR's Determination Notice further states that:

"The inflation adjustment formula (dI) to be used during the 2009 – 2014 tariff period shall remain:

$$\mathbf{dI = [0.76 * \Delta e + 0.76 * 0.922 * \Delta e * i_{US} + 0.76 * 0.922 * i_{US} + 0.24 * i_j]}$$

Where:

Δe	= percentage change in the Base Exchange Rate
i_{US}	= US inflation rate (as defined in the Licence)
i_j	= Jamaican inflation rate (as defined in the Licence)
f_{US}	= US factor = 0.76
f_I	= Local (Jamaica) factor = 0.24"

1.2 Current year annual inflation adjustment factor (dI – X)

The annual adjustment allows JPS to adjust its rates to reflect general movements in prices, improvements in productivity, changes in service quality, changes in the base foreign exchange rate and where applicable an adjustment for unforeseen occurrences beyond management control not captured in the other elements of the PBRM. The following outlines JPS' proposal in relation to the components of the dPCI and its application to the non-fuel tariffs for 2011.

The application of the annual escalation adjustment formula (dI - X) will result in a reduction of 1.70% to the non-fuel tariff basket, derived using the following factors:

- Jamaican point-to-point inflation (i_j) as at February 28, 2011 of 7.18%, derived from the most recent CPI data[1] (see Appendix I);
- U.S. point-to-point inflation rate (i_{US}) as at February 28, 2011 of 2.11%, derived from the U.S. Department of Labor statistical data[2] (see Appendix I); and
- The 2.81% reduction in the Base Exchange Rate (Δe) from J$89:US$1 to J$86.5:US$1.

Table 1.1 below sets out the details of the annual escalation adjustment factor that amounts to a 1.70% reduction for 2011.

[1] Obtained from the Statistical Institute of Jamaica.
[2] Obtained from U.S. Bureau of Labor Statistics website, http://data.bls.gov/cgi-bin/surveymost

1.2 Current year annual inflation adjustment factor (dI – X) (Cont'd)

Table 1.1

Escalation Factor

Line	Description	Formula	Value
L1	Base Exchange Rate		89.00
L2	Proposed Exchange Rate		**86.50**
L3	Jamaican Inflation Index		
L4	CPI @ Feb 2011		167.1
L5	CPI @ Feb 2010		155.9
L6	US Inflation Index		
L7	CPI @ Feb 2011		221.3
L8	CPI @ Feb 2010		216.7
L9	Exchange Rate Factor	(L2-L1)/L1	-2.81%
L10	Jamaican Inflation Factor	(L4-L5)/L5	7.18%
L11	US Inflation Factor	(L7-L8)/L8	2.11%
L12	Escalation Factor	0.76*(L9*(1+0.922*L11)+0.922*L11)+0.24*L10	1.02%
L13	Productivity (or X-Factor) Adjustment		2.72%
L14	Escalation Adjustment net of X-Factor	(L12-L13)	-1.70%

1.3 Application of the Annual Inflation Adjustment Factor

Based on Table 1.1 above, an annual adjustment factor of -1.70% can be applied to the total tariff basket. The adjustment in each tariff will be weighted, thus the adjustment across rates will be dependent on their relative weights in relation to the total tariff basket. The tariff basket, shown in Table 1.2 below, is derived using the 2010 billing determinants and the approved non-fuel tariffs arising out of the OUR's June 9, 2010 Determination Notice (see Table 1.4 for the approved 2010 tariffs).

Table 1.2

Total Non-Fuel Tariff Basket

Class		Block/ Rate Option	Customer Charge Revenue (J$'000)	Energy Revenue (J$'000)	Demand (KVA) Revenue (J$'000)				Total Demand Revenue (J$'000)	Total Revenues (J$'000)
					Std.	Off-Peak	Part-Peak	On-Peak		
Rate 10	LV	< 100 kWh	662,441	2,569,438	-	-	-	-	-	3,231,879
Rate 10	LV	> 100 kWh	1,099,167	9,750,572	-	-	-	-	-	10,849,739
Rate 20	LV		450,186	8,869,885	-	-	-	-	-	9,320,070
Rate 40	LV	STD	83,242	2,174,013	2,898,334	-	-	-	2,898,334	5,155,589
Rate 40	LV	TOU	7,231	488,975	-	23,080	229,141	222,755	474,976	971,182
Rate 50	MV	STD	5,189	1,222,216	1,170,027	-	-	-	1,170,027	2,397,432
Rate 50	MV	TOU	1,546	658,123	-	33,795	318,033	331,042	682,869	1,342,537
Rate 60	LV		6,852	1,143,073	-	-	-	-	-	1,149,925
Total			2,315,853	26,876,296	4,068,361	56,874	547,173	553,797	5,226,206	34,418,354

1.3 Application of the Annual Inflation Adjustment Factor (Cont'd)

The weights of each tariff, relative to the total tariff basket shown in Table 1.2, are shown in Table 1.3 below.

Table 1.3

Non-Fuel Tariff Basket Weights

Class		Block/ Rate Option	Customer Charge	Energy Charge	Demand Charge Std.	Demand Charge Off-Peak	Demand Charge Part Peak	Demand Charge On-Peak	Total
Rate 10	LV	<100	1.92%	7.47%	0.00%	0.00%	0.00%	0.00%	9.39%
Rate 10	LV	>100	3.19%	28.33%	0.00%	0.00%	0.00%	0.00%	31.52%
Rate 20	LV		1.31%	25.77%	0.00%	0.00%	0.00%	0.00%	27.08%
Rate 40	LV - Std		0.24%	6.32%	8.42%	0.00%	0.00%	0.00%	14.98%
Rate 40	LV - TOU		0.02%	1.42%	0.00%	0.07%	0.67%	0.65%	2.83%
Rate 50	MV - Std		0.02%	3.55%	3.40%	0.00%	0.00%	0.00%	6.97%
Rate 50	MV - TOU		0.00%	1.91%	0.00%	0.10%	0.92%	0.96%	3.89%
Rate 60	LV		0.02%	3.32%	0.00%	0.00%	0.00%	0.00%	3.34%
TOTAL			**6.72%**	**78.09%**	**11.82%**	**0.17%**	**1.59%**	**1.61%**	**100.00%**

The non-fuel base rates approved in the 2010 Tariff Determination Notice that were used to derive the 2010 non-fuel tariff basket, are shown in Table 1.4 below.

Table 1.4

OUR approved Non-Fuel Tariffs for 2010

Class		Block/ Rate	Customer charge J$/Month	Energy Charge J$/kWh	Demand Charge-J$/KVA Std.	Demand Charge-J$/KVA Off-Peak	Demand Charge-J$/KVA Part Peak	Demand Charge-J$/KVA On-Peak
Rate 10	LV	<100	287.50	6.41	-	-	-	-
Rate 10	LV	>100	287.50	14.66	-	-	-	-
Rate 20	LV		632.50	12.53	-	-	-	-
Rate 40	LV - Std		4,600.00	3.57	1,295.28	-	-	-
Rate 40	LV - TOU		4,600.00	3.57	-	54.98	569.92	729.27
Rate 50	MV - Std		4,600.00	3.39	1,165.75	-	-	-
Rate 50	MV - TOU		4,600.00	3.39	-	51.81	505.16	647.64
Rate 60	LV		1,725.00	15.50	-	-	-	-

The rates shown above are reproduced from Table 4.5 "Approved Non-Fuel Tariffs for 2010-11" in the OUR's Determination Notice – Jamaica Public Service Company Limited, Annual Tariff Adjustment 2010, Document No. Ele 200. These non-fuel base rates were determined at a base exchange rate of J$89:US$1.

1.3 Application of the Annual Price Adjustment Factor (Cont'd)

Table 1.5 below shows how JPS proposes to apply the annual price adjustment factor of -1.70% to the individual tariffs, with some level of tariff rebalancing between the rate classes.

Table 1.5

Proposed Annual Non-Fuel Price Adjustment per tariff

Class		Block/ Rate Option	Customer Charge J$/Month	Energy Charge J$/kWh	Demand Charge-J$/KVA Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV	--100	4.347%	-2.039%				
Rate 10	LV	> 100	4.347%	-2.039%				
Rate 20	LV		4.347%	-2.000%				
Rate 40	LV - Std		4.347%	-2.000%	-2.000%			
Rate 40	LV - TOU		4.347%	-2.000%		-2.000%	-2.000%	-2.000%
Rate 50	MV - Std		4.347%	-2.000%	-2.000%			
Rate 50	MV - TOU		4.347%	-2.000%		-2.000%	-2.000%	-2.000%
Rate 60	LV		4.347%	-5.000%				

In accordance with the Licence, the weighted annual adjustment factor proposed by JPS should equate to the annual adjustment factor of -1.70%. Proof of this is shown in table 1.6 below.

Table 1.6

Weighted Non-Fuel Inflation Adjustment

Class		Block/ Rate Option	Customer Charge J$/Month	Energy Charge J$/kWh	Demand Charge-J$/KVA	Off-Peak	Part Peak	On-Peak	Total
Rate 10	LV	--100	0.08%	-0.15%	-0.00%	0.00%	0.00%	0.00%	-0.07%
Rate 10	LV	> 100	0.14%	-0.58%	0.00%	0.00%	0.00%	0.00%	-0.44%
Rate 20	LV		0.06%	-0.52%	0.00%	0.00%	0.00%	0.00%	-0.46%
Rate 40	LV - Std		0.01%	-0.13%	-0.17%	0.00%	0.00%	0.00%	-0.29%
Rate 40	LV - TOU		0.00%	-0.03%	0.00%	0.00%	-0.01%	-0.01%	-0.05%
Rate 50	MV - Std		0.00%	-0.07%	-0.07%	0.00%	0.00%	0.00%	-0.14%
Rate 50	MV - TOU		0.00%	-0.04%	0.00%	0.00%	-0.02%	-0.02%	-0.08%
Rate 60	LV		0.00%	-0.17%	0.00%	0.00%	0.00%	0.00%	-0.17%
TOTAL			**0.29%**	**-1.69%**	**-0.24%**	**0.00%**	**-0.03%**	**-0.03%**	**-1.70%**

1.3 Application of the Annual Inflation Adjustment Factor (Cont'd)

Table 1.7 below shows the proposed rates for 2011/12 after resetting the base exchange rate and after application of the proposed non-fuel price adjustments shown in Table 1.5.

Table 1.7

Summary of Proposed 2010/11 Non-Fuel Tariffs

Class		Block/ Rate Option	Customer Charge J$/Month	Energy Charge J$/kWh	Demand Charge-J$/KVA			
					Std.	Off-Peak	Part Peak	On-Peak
Rate 10	LV	--100	300.00	6.28	-	-	-	-
Rate 10	LV	> 100	300.00	14.36	-	-	-	-
Rate 20	LV		660.00	12.28	-	-	-	-
Rate 40	LV - Std		4,800.00	3.50	1,269.37	-	-	-
Rate 40	LV - TOU		4,800.00	3.50	-	53.88	558.52	714.68
Rate 50	MV - Std		4,800.00	3.32	1,142.44	-	-	-
Rate 50	MV - TOU		4,800.00	3.32	-	50.77	495.06	634.69
Rate 60	LV		1,800.00	14.73	-	-	-	-

Please note that a detailed analysis of the non-fuel tariff adjustment for 2011/12 and the total bill impact for the typical JPS customer in each rate class has been provided in Appendix II. This shows that the total bill impact for the typical JPS customer in each rate class ranges from an increase of 0.03% to 0.32%.

While there is an overall 1.70% reduction in the non-fuel tariffs, this includes the impact of the resetting of the base exchange rate from J$89:US$1 to J$86.5:US$1. The reduction attributable to the resetting of the base exchange rate is already reflected in customer bills through the foreign exchange adjustment clause. Accordingly, if there were no change in the base exchange rate, then the annual price adjustment factor would have resulted in an increase of 0.48%. This explains why the total bill impact for all rate classes actually reflects a marginal increase.

Section 2: Ensuring Quality of Service: The Q-Factor

2.1 Introduction

The PBRM as expressed in the price-cap formula below includes a price adjustment component, Q, which captures the changes in the quality of service provided to customers by JPS.

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

JPS and the OUR have agreed in principle that the Q-factor should meet the following criteria:

- It should provide the proper financial incentive to encourage JPS to continually improve service quality. It is important that random variations should not be the source of reward or punishment;
- It should be accurate and transparent without undue cost of compliance;
- It should provide a fair treatment for factors affecting performance that are outside of JPS' control, such as those due to disruptions by the independent power producers; natural disasters; and other *Force Majeure* events, as defined under the Licence; and
- It should be symmetrical in application of rewards and penalties, as stipulated in the Licence.

In the 2009 Tariff Review Determination Notice, the OUR stipulated the following in relation to the Q-factor:

> *"The Office has determined that once the base-line data is deemed reliable for SAIDI and SAIFI and CAIDI on the improved basis that the targets and penalty/reward scoring system be revised during the 2009 - 2014 annual adjustment submissions. The Q-factor adjustment for 2009 will therefore remain within the dead band and therefore zero.*
>
> *The Office further determines that it will include MAIFI as part of the Q-factor adjustment mechanism going forward as of 2010, but given the significant challenges and concerns highlighted by JPS, the weighting of MAIFI in the point score system will be assessed for its resultant tariff impact and for further decision by the Office.*
>
> *Additionally, the Office has determined that Generation outages caused from IPP plants should be excluded from the Q-factor calculations."*

Further, in our subsequent discussions with the OUR, JPS was directed in a letter dated May 17, 2010 to provide the monthly outage data and computation of SAIDI, SAIFI and CAIDI for the year under review.

Accordingly, we now provide that data for the full year 2010, along with the recommended penalty/reward scoring system.

2.2 The benchmark SAIDI, SAIFI and CAIDI

The verified set of SAIDI, SAIFI, and CAIDI indices for 2010 will be used as the benchmark quality level. MAIFI is still not deemed appropriate for inclusion in the actual penalty/reward scoring system for the many reasons highlighted in our 2009 Tariff Review Submission.

Furthermore, it is determined that SAIDI and SAIFI should be improved by 2% in 2011 relative to the 2010 performance level and by 3% (relative to the same 2010 benchmark) in each successive year from 2012 to 2014. Accordingly, the targets are shown in Table 2.1 below.

Table 2.1: JPS Proposed Targets for the Q-factor 2011 – 2014

Year	Target SAIDI	Target SAIFI	Target CAIDI
2010	$SAIDI_{2010}$	$SAIFI_{2010}$	$CAIDI_{2010}$
2011	$SAIDI_{2010}*(1 - 0.02)$	$SAIFI_{2010}*(1 - 0.02)$	$CAIDI_{2010}$
2012	$SAIDI_{2010}*(1 - 0.05)$	$SAIFI_{2010}*(1 - 0.05)$	$CAIDI_{2010}$
2013	$SAIDI_{2010}*(1 - 0.08)$	$SAIFI_{2010}*(1 - 0.08)$	$CAIDI_{2010}$
2014	$SAIDI_{2010}*(1 - 0.11)$	$SAIFI_{2010}*(1 - 0.11)$	$CAIDI_{2010}$

JPS recommends that the quality of service performance should continue to be classified into three categories, with the following point system:

- Above Average Performance (greater than 10% above benchmark) — would be worth 3 Quality Points on either SAIFI, SAIDI, or CAIDI;
- Dead Band Performance (+ or – 10%) — would be worth 0 Quality Points on either SAIFI, SAIDI, or CAIDI; and
- Below Average Performance (more than 10% below target) — would be worth -3 Quality Points on SAIFI, SAIDI, or CAIDI.

We recommend consistent with previous determinations, that, if the sum of Quality Points for:

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

Since the performance in each of the three performance measures can either be above target, below target or on target (dead band) there are twenty-five (25) possible outcomes as shown in Table 2.2 below.

2.2 The benchmark SAIDI, SAIFI and CAIDI (Cont'd)

Table 2.2 Possible Q-factor scores

SAIDI	SAIFI	CAIDI	TOTAL	ADJUSTMENT FACTOR
3	3	3	9	0.50%
3	3	0	6	0.40%
3	0	3	6	0.40%
0	3	3	6	0.40%
3	0	0	3	0.25%
0	0	3	3	0.25%
0	3	0	3	0.25%
3	3	-3	3	0.25%
-3	3	3	3	0.25%
3	-3	3	3	0.25%
0	0	0	0	0.00%
3	0	-3	0	0.00%
-3	3	0	0	0.00%
0	-3	3	0	0.00%
-3	0	3	0	0.00%
0	0	-3	-3	-0.25%
0	-3	0	-3	-0.25%
-3	0	0	-3	-0.25%
3	-3	-3	-3	-0.25%
-3	-3	3	-3	-0.25%
-3	3	-3	-3	-0.25%
-3	0	-3	-6	-0.40%
0	-3	-3	-6	-0.40%
-3	-3	0	-6	-0.40%
-3	-3	-3	-9	-0.50%

This design of the Q-factor adjustment as a component of the PBRM continues to be symmetrical and all possible outcomes are properly defined based on the PBRM point system. The design is balanced as it provides equal opportunity for either a positive or negative adjustment to the PBRM.

2.3 Past five-year performance on SAIDI, SAIFI and CAIDI

Table 2.3 below outlines JPS performance for the past five (5) years in the three main quality of service measures: SAIDI, SAIFI and CAIDI. The data shown here is for the complete system performance and includes interruptions due to generation, transmission and distribution outages. Additionally, the distribution interruptions include both feeder level and sub-feeder level outages. All the computations are based on the respective years' customer base.

Table 2.3.1: JPS 2006-2010 performance on SAIDI

	SAIDI				
	2006	2007	2008	2009	2010
T&D	2,814	2,538	2,308	1,925	1,945
Generation	604	402	198	343	631
System Total	3,418	2,940	2,506	2,268	2,577
Annual % Reduction		14%	15%	9%	-14%
Average Annual % Reduction	*5%*				

2.3 Past five-year performance on SAIDI, SAIFI and CAIDI (Cont'd)

Table 2.3.2: JPS 2006-2010 performance on SAIFI

	SAIFI				
	2006	2007	2008	2009	2010
T&D	17.79	16.25	16.85	14.41	14.03
Generation	14.01	7.37	7.49	11.81	15.08
System Total	31.80	23.62	24.34	26.22	29.11
Annual % Reduction		26%	-3%	-8%	-11%
Average Annual % Reduction	*2%*				

Table 2.3.3: JPS 2006-2010 performance on CAIDI

	CAIDI				
	2006	2007	2008	2009	2010
T&D	158	156	137	134	139
Generation	43	55	26	29	42
System Total	107	124	103	86	89
Annual % Reduction		-16%	17%	16%	-2%
Average Annual % Reduction	*4%*				

JPS average performance per year over the past five (5) years averaged 5%, 2% and 4% for SAIDI, SAIFI and CAIDI respectively.

The details of the monthly performance in SAIDI, SAIFI and CAIDI for 2010 are provided in Table 2.4 below.

Table 2.4 Monthly SAIDI, SAIFI and CAID date for 2010

Month	SAIDI	SAIFI	CAIDI
Jan	211.7	1.41	150.2
Feb	195.8	2.41	81.3
Mar	203.5	3.03	67.1
Apr	194.6	3.32	58.6
May	253.2	3.22	78.6
Jun	263.6	3.19	82.6
Jul	269.4	2.88	93.5
Aug	321.4	3.18	101.2
Sep	212.6	2.52	84.5
Oct	172.8	1.53	113.3
Nov	173.8	1.25	138.5
Dec	104.1	1.16	89.6
System Total	**2,576.5**	**29.11**	**88.52**

2.4 Data collection methods

The calculation of SAIDI, SAIFI and CAIDI indices requires key information to be collected. Namely:

- Outage start and end times;
- System total number of customers; and
- Number of customers affected by each outage.

2.4.1 Outage Start and End Times

Feeder-level outage

At the feeder level all planned and forced outages are collected and stored in a Microsoft Access-based outage-logging database (developed in-house) located at System Control Centre. This information contains all the start and end times associated with the individual outages. These outage times are derived from the SCADA system and in the event of communication failure the outage start times be derived from the customer call log, when the first affected customer called.

Sub-feeder level outages

- Planned outages – planned outages at the sub-feeder level, are from Outage Log Database at the System Control Centre. The outage times are derived from actual switching times logged by the System Control Engineer or Dispatch Technician.
- Forced outages – the central call centre logs are used to provide outage start times. The start time is derived from the time the first affected customer called. The outage end time is determined by the recloser or switch closing time as reported to the system control engineer or dispatch technician by the field personnel and also recorded in the call centre log.

2.4.2 Number of Customers Interrupted

Feeder-Level Outages

The actual customer count for the previous year for each feeder is utilised in the computation of the reliability indices. The determination of the customer location with respect to each feeder is determined by each customer's GPS location and/or the civic address relative to National Land Valuation (NLA) parcel information.

Sub-feeder level outages

JPS has concluded the labelling of poles and in particular for all sub-feeder switch locations with actual customer count. A detailed and comprehensive assessment and verification exercise of actual customer count per switch location at the sub-feeder level was concluded March 2011 and that data is provided in Appendix III. JPS has also commenced since January 2011 the collection of pole numbers for each outage event to be used in parallel with the current method of using fuse size to determine number of customers affected.

2.5 Improvements in Data Maintenance

Consistent with our commitment to improve the accuracy and reliability of the customer count, JPS continues to dedicate substantial resources to achieve this objective. This includes the following:

- Staffing – 1 Manager – System Reliability
    - 2 – GIS Analyst
    - 2 - GIS Technician Engineer
    - 10 - 3rd party contractors working towards improving the data accuracy.
- Data Infrastructure –
    - ESRI Arc GIS Server and Desktop v9.3
    - GeNome – JPS Trouble Call Management System
- GPS Mapping and Field Data Capture of asset attributes
  Total switch locations of 39,069 customer supply point.
    - 28,862 transformer switch locations
    - 10,107 lateral switch locations.
- Established Geometric Network (ESRI GIS)– Mechanism used to develop and maintain the connectivity of 573,023 customers to switch locations to line switches and to feeder reclosers.
- Established policies and procedures to ensure the routine maintenance of the customer count throughout the distribution network.

2.5.1 Current data collection improvements

Consistent with the unique number (identifiers) for each of the 110 feeders island-wide JPS now has unique numbers (identifiers) for each of the over 39,000 switch locations island-wide. This unique identifier is a 6 digit number affixed to each pole. Since January 2010 all new concrete poles manufactured have this unique number affixed.

The present practice is to log all outage events to the pole number of the fuse that operated, which now results in each outage being assigned to a unique switch identifier, and in turn an accurate customer count.

<u>Feeder-Level Outages</u>

These outages will continue to be captured at the System Control Centre outage-logging database with time stamped using the data provided by the SCADA system.

<u>Sub-feeder level outage</u>

- Planned outages—for planned outages at the sub-feeder level, all outages are currently tied to a switching point and unique pole number, which in turn is mapped to a customer count. The start and end times are recorded and captured in the Outage Log Database at the System Control Centre.
- Forced outages— for forced outages JPS will continue using the start time of outages as that reported by the first customer and the end time as that determined by the recloser or switch closing time.

2.5 Improvements in Data Maintenance (Cont'd)

2.5.2 JPS Proposal

JPS will commence utilising the improved data capture mechanism with actual customer count to compute system reliability indices for 2011. That is, JPS will calculate the reliability indices using both techniques (use of fuse size data and the use of actual customer count) for the remainder of the calendar year 2011. After this point a benchmark performance will be established and the average percentage change over the past five (5) years applied to set reliability targets for 2012 and beyond.

As submitted in previous years, a total system customer count is provided along with the individual feeder counts. In addition, JPS will submit this year all unique switch pole numbers with their respective customer count for each feeder to ensure consistency and auditability of data.

2.6 JPS System Reliability Improvement Programme

JPS has increased the level of focus and priority aimed at improving the reliability of service to its customers. In addition to investment in the improvement of the measurement system, a significant investment is being made to rehabilitate and reinforce the T&D network. Over the past 2 years more than US$20M has been invested in a number of projects aimed at improving the quality of service to customers.

<u>JPS 2011 System Reliability Objectives</u>

- **Reduction in SAIDI**
    a. Faster dispatch and response time to outages; and
    b. Utilisation of Trouble Call Management System (GeNome) to prioritize section outages having greater impact on SAIDI.

- **Utilize actual customer count to compute reliability indices.**

- **Reduction in SAIFI & by extension SAIDI**
    a. Reduction in the number of outages by targeting the top five (5) worst performing feeders; and
    b. Implement targeted preventative maintenance programme for all parishes.

- **Application of Technology**
    a. Pole mounted reclosers;
    b. Insulated MV conductor covers;
    c. GIS Vegetation Mapping & Management; and
    d. Application of drop-out fuse with reclosing feature

2.6 JPS System Reliability Improvement Programme (Cont'd)

The table below details the capital investment projects for 2010 and 2011 aimed at improving reliability performance.

Table 2.5 System reliability Capital Expenditure

T&D System		
Description	**2010**	**2011**
	{US$M}	{US$M}
Structural Integrity (replacement of poles)	4.500	5.000
Substation Line in Line	1.500	1.500
Pole-mounted reclosers	0.200	0.250
Targeted feeders distribution reliability improvement	1.005	2.000
Pole-mounted transformer replacement	2.830	1.804
Tools and other regional activities (line relocation for safety and access)	-	0.500
Total	**10.035**	**11.054**

2.7 Proposed adjustments to reliability Indices

CAIDI, the average duration of a sustained interruption experienced by a customer, has been monitored and reported by JPS to the OUR since 2004 when the reliability indices were first introduced in the PBRM. It has long been viewed that the monitoring of SAIDI and SAIFI and in particular CAIDI presented some ambiguity due to the mathematical relationship between the indices and as such the expertise of an outside consultant was sought.

As stated in our 2009 Tariff Review Application, the report presented by Pacific Economic Group confirmed JPS' position and as such we again recommend that the Office discontinue the use of CAIDI as a benchmark, while upholding the use of SAIDI and SAIFI.

In the report [3]***X Factor and Q factor Recommendations for JPS, October 2008*** presented by **Pacific Economic Group** the reasons for CAIDI exclusion are outlined as:

- "The metric is redundant when SAIDI and SAIFI are already included in the metrics"
- [4]"It can be demonstrated mathematically that SAIDI and SAIFI are ultimately what matters to customers"
- "Using SAIDI, SAIFI and CAIDI to measure quality can lead to anomalous and unwarranted penalties or rewards in a service quality mechanism"

[3] A copy of the report can be viewed in Annex I: X factor and Q factor Study in the Tariff Review Application 2009-2014

[4] Please see Appendix three of the ***X factor and Q factor recommendations for JPS, October 2008***, for mathematical proof of what matters to customers.

2.7 Proposed adjustments to reliability Indices (Cont'd)

An incident of anomalous penalties was observed in the 2008 annual tariff submission, where SAIDI and SAIFI were above the target by 10% and 33% respectively, however, CAIDI was below the target by 37%. The poor performance in CAIDI was as a result of the mathematical relationship between CAIDI and the other two indices. Because there was a greater reduction in SAIFI than the reduction in SAIDI this caused the measured value of CAIDI to be greater, resulting in a worsened CAIDI. This CAIDI value does not accurately represent a reduction in the quality of service to customers, as both the frequency and the duration of outages were reduced. However JPS was penalized with the awarding of –3 quality points for the 'worse than target' CAIDI value.

It is important to note, therefore, that Table 2.1 had an inherent mathematical error in it as it relates to the derivation of the CAIDI target for 2006 – 2009. Since CAIDI represents SAIDI divided by SAIFI, if SAIDI and SAIFI were expected to improve by the same percentage each year, then CAIDI should have been held constant[5].

For the calendar year 2010 and subsequent years JPS proposes that CAIDI be removed from the PBRM. Failing the removal, then the factor for CAIDI would have to be held constant to allow the normal mathematical relationship between SAIDI and SAIFI to remain true.

The performance targets for 2011 shall be based on the 2010 benchmark adjusted for 2% improvement for both of the indices (SAIDI and SAIFI). The actual performance targets for 2010 are shown in table 2.6 below along with the recommended target for 2011:

Table 2.6: Setting the 2011 Q-factor performance benchmark

	2010 Actual	Adjustment factor		2011 Target
SAIDI	2577	* (1 – 0.02)	=	2525
SAIFI	29.11	* (1 – 0.02)	=	28.52
CAIDI	88.52	* (1 – 0.00)	=	88.52

Additionally, the proposed targets for 2011 – 2014 are shown in Table 2.7 below.

Table 2.7: Setting the Q-factor performance benchmark for 2011 - 2014

		2011	2012	2013	2014
Projection	SAIDI	2,525	2,448	2,370	2,293
	SAIFI	28.52	27.65	26.78	25.90
	CAIDI	88.52	88.52	88.52	88.52

This proposed target represents an 11% reduction in the reliability indices over a 4-year period ranging from 2010 to 2014.

[5] That is to say if SAIDI is assumed to be 2,500 and SAIFI is 100, then CAIDI must be 25 (2,500/100). If we assume a 10% improvement in SAIDI and SAIFI, to 2,250 and 90 respectively, it stands to reason that CAIDI must remain constant at 25 (2,250/90). Therefore, to assume that CAIDI will also improve by 10% is mathematically incorrect. This explains why the inclusion of CAIDI is redundant and why the assumption that CAIDI will also improve each year is incorrect.

3. Fuel Cost Adjustment Factor – Heat Rate

3.1 Introduction

Heat rate is one of two efficiency measures (the other being Systems Losses) that JPS must meet if it is to be allowed to recover its full cost of fuel. If the Company fails to achieve the stipulated efficiency targets it will experience an under-recovery of its fuel cost. For example, in 2010, JPS incurred a total fuel cost of approximately US$578M (or J$50 Billion) but was only allowed to recover US$565M, as a result of its performance in the two efficiency measures relative the regulatory targets. As such, the Company experienced a 2.3% penalty (or under-recovery of its actual fuel costs) amounting to US$13.4M (or J$1.2 Billion) during 2010.

Heat rate is reported in kJ/kWh and represents the efficiency with which fuel (chemical energy) is converted to electrical energy.

According to Section 3(D) of Schedule 3 of the Licence:

> *"the Licencee shall apply the Fuel Rate Adjustment Mechanism that is in force on the date of this Licence. The Fuel Cost Mechanism that is in force on the date of this Licence is described in Exhibit 2."*

The provisions of Exhibit 2 are that the total applicable energy cost for a given month's billing period includes:

> *"The cost of fuel per kilo-watt hour (net of efficiencies) shall be calculated each month on the basis of the total fuel computed to have been consumed by the Licencee and Independent Power Producers (IPPs) in the production of electricity as well as the Licencee's generating heat rate as determined by the Office at the adjustment date and the IPPs generation heat rate as per contract with the IPPs and systems losses as determined by the Office at the adjustment date of total net generation (the Licencee and IPPs)"*

In the 2009 Tariff Review Determination Notice, the OUR stated:

> *"The Office has determined that the applicable heat rate for 2009/2010 is 10,400 kJ/kWh. Furthermore the Office has determined that the heat rate target will be reviewed and reset whenever there are new capacity additions to the national grid."*

Additionally, the OUR also made the following statements:

> *"The OUR is of the view that the objective for setting the heat rate target for the generation system is to ensure that customers are provided with fair and reasonable fuel rates by having a regulatory environment that provides JPS with the incentives to:*
>
> - *Improve the relative efficiency of converting chemical energy to electrical energy; and*
> - *Ensure economic dispatch of all available generation units.*

And further that:

> *"The OUR is of the view that the following principles should be applied in setting the heat rate target:*
>
> - *The target should hold JPS accountable for the factors which are under its direct control;*
> - *The target should adequately and realistically reflect the available and future (within the rate-cap period) generating fleet's capabilities and legitimate constraints."*

3. Fuel Cost Adjustment Factor – Heat Rate (Cont'd)

3.2 Resetting the heat rate target for 2011/12

As discussed with the OUR, there are two developments that should be taken into consideration for the purposes of resetting the heat rate target in 2011. The first adjustment relates to the 65.5 MW generation expansion project by Jamaica Energy Partners (JEP) and the second adjustment relates to the proposed restatement of the reported contracted heat rate for JEP into kJ/kWh.

The OUR has already agreed by way of its letter dated March 31, 2010, that the heat rate target should be adjusted by 120 kJ/kWh for the 65.5 MW generation expansion. Additionally, as explained in JPS' letter dated March 30, 2011, the heat rate target should also be adjusted by 91kJ/kWh consistent with the planned change in the reporting basis for the JEP contracted heat rate.

As a result of the aforementioned matters, JPS hereby requests that the heat rate target be revised from 10,400 kJ/kWh to 10,611 kJ/kWh for the 2011/12 period.

4. Fuel Cost Adjustment Factor – System Losses

4.1 Overview

The 2009-14 OUR Tariff Review Determination states in respect of the system loss target:

"the new target for system losses is 19.5% to May 30, 2011 then 17.5% as of June 1, 2011 to May 30, 2012. Subsequent targets are to be determined at the Annual Adjustment exercise".

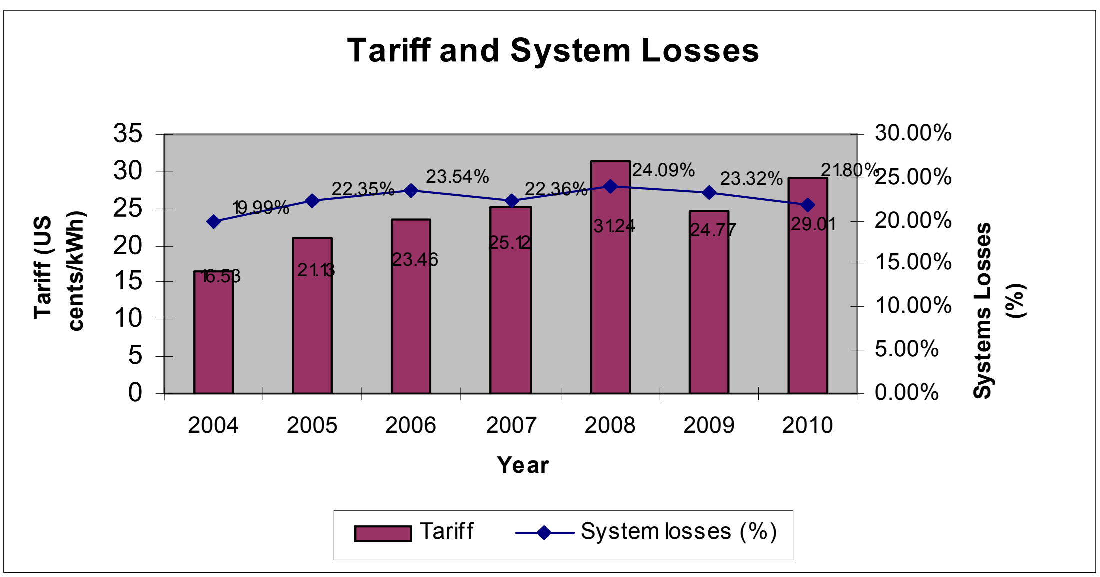
The approach of the OUR to the resetting of the target – raising the target to more closely reflect the 23% actual at the time followed by rapid reduction – reflects in our view the OUR's assessment of the outturn for the 2004-09 tariff period and strong optimism in the package of initiatives to be pursued by JPS in the 2009-14 tariff periods. The results of the 2010 war on losses have proved this optimism to be well placed but overly ambitious. As a result the Company is requesting a review of the reset of the losses target for the 2011-12 period based on the experiences and realities encountered during the first year of the revised programme.

Brief review of the 2004 – 2009 Tariff period losses outturn

In 2007 JPS aggressively expanded its loss reduction programmes in response to an upward trend in electricity theft as the price of power climbed, driven by events on the international oil commodity market. System Losses over the previous two years had increased from 19.9% in 2004 to 23.5% in 2006. The 2007 renewed thrust focused on a significant expansion of the Loss Reduction unit, the aggressive removal of throw-ups and increased auditing and investigation of accounts. This continued into 2008 with the introduction of "smart meters" and the Advance Metering Infrastructure (AMI); meter resealing and integrity verification project and the installation of meter centres and the removal of service-side infrastructure from disconnected customers to prevent tampering.

Figure 4.1

Correlation of Systems Losses and Electricity Prices 2004-10



JPS had modest success in 2008 in combating losses, which fell from 24.09% in 2008 to 23.32% in 2009, but this was still well shy of the regulatory target of 15.8% at the time. In fact JPS has never been able to achieve the regulatory target for losses in at least 15 years. The effort was primarily one of containment in the growth of losses as the record peak in oil prices in 2008 also drove electricity prices to new highs and with it the propensity to steal in Jamaica's already crime pervasive culture. Figure 4.1 illustrates the trend of System Losses and its correlation with Electricity prices. Historically, Electricity prices have had a dramatic adverse influence on the level of systems losses.

4.1.1 Revised Approach to Combating System Losses

Given the threat of a mushrooming in losses and the debilitating effect of this on the company's revenues, through the fuel penalty, from its inability to achieve the regulatory target, JPS proposed a fresh approach to loss reduction in its 2009-14 Tariff Review Application.

This multi-prong plan involved:

1. The commissioning of the first study on the factors driving losses included with the application.
2. A Commitment to investing unprecedented levels of capital expenditure on losses.
3. Deployment of a technology-led strategy supported by the largest mobilization of staff and third party agents dedicated to loss reduction.
4. Revision of the regulatory target for losses to better reflect the intransigent and pervasive nature of this crime as well as ensure JPS remains focused and motivated to reduce losses.
5. Introduction of punitive fines and penalties to strengthen both deterrence and punishment for an offence.

The details of this new comprehensive approach to loss reduction are documented in Section 8.2 & 9 of the ***Tariff Review Application 2009-2014***.

The OUR, through key provisions and allowances in its October 2009 Determination gave substantial backing and support for JPS' fresh approach to combating losses. Highlights of the OUR's determination on loss reduction includes:

- An upward revision of the regulatory target for system losses to 19.5% to May 30, 2011 then 17.5% as of June 1, 2011 to May 30, 2012. Subsequent annual targets are to be determined at the Annual Tariff Adjustment Application.

- An amount of 0.4US c/kWh was awarded in the tariff as a dedicated revenue stream to fund the capital expenditure associated with system losses initiatives such as the implementation of Advanced Metering Infrastructure and other loss reduction technology. This Electricity Efficiency Improvement Fund (EEIF) provided a revenue stream of US$8.67M (net of taxes) for additional capital expenditure on losses.

- JPS shall be allowed to charge a rate equivalent to the prevailing interest rate on customer deposits on all sums associated with back-billing arising from the theft of electricity.

The annual reset of the losses target represents a departure from the five-year reset under the 2004-09-tariff period and is in fact inconsistent with the principles of the Performance-Based Ratemaking-Mechanism (PBRM) of the tariff framework. However, this departure from the PBRM was an acknowledgement by the OUR of the dynamic and fluid nature of losses in the Jamaican context and the significant impact of factors such as oil price volatility and changing macro and socio-economic conditions. The Company therefore did not object to this variation of the principles of the PRBM at the time in recognition of the fact that it allows the regulator and JPS flexibility on an annual basis to evaluate the range of factors that affect losses – electricity price, macro-economic conditions, energy sales outturn, capital expenditure, the success or challenges of anti-loss initiatives and the social impact and challenges created by successful implementation of these initiatives. JPS therefore supports an annual review of the loss target given the dynamic nature of the problem and its significant impact on fuel cost recovery.

With an improved regulatory framework in place, JPS in the fourth quarter 2009 (the 2009-14 Determination took effect on October 1, 2009) constructed a medium-term Loss Reduction Programme to aggressively lower losses by two (2) per cent in 2010 and overall by 5.2% to 2015.

4.1.2 Losses Outturn for 2010

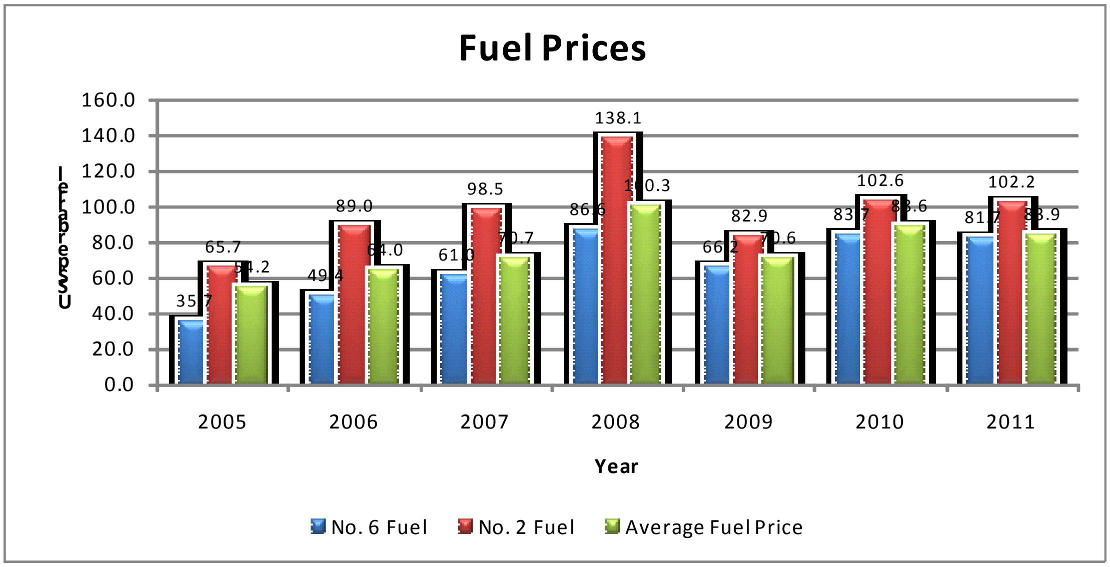
JPS realized a 1.58% reduction in losses in 2010, the first year of its medium term initiative. Losses fell from 23.32% in December 2009 to 21.8% as at December 2010, the largest annual rollback in losses in over 15 years, reducing total losses to the lowest level since August 2005. This achievement, while short of the targeted 2% reduction for 2010 clearly demonstrates the effectiveness of the medium-term programme in the face of significant and unplanned challenges.

Some of these challenges included:

- The delay in the 2009-2014 Determination from June 2009 to October 2009,which affected planning, funding and implementation of initiatives;
- Interruptions and redesign of initiatives due to the West Kingston saga.
- Teething challenges with the deployment of the new advanced metering infrastructure technology;
- Falling energy sales due to the sustained slowdown in the economy, which offset some of the gains of the anti-loss initiatives.
- Adverse price movements due to the introduction of a 10% General Consumption Tax (GCT) on electricity services as well as the upward trend in oil prices during the year, which negatively affected customer ability to afford the product.
- Extensive, prolonged and unplanned social intervention in Red Zone Communities in the pre and post implementation phases of the Residential AMI (RAMI) projects. These interventions often delayed the start and commissioning of projects but were nevertheless indispensable to assist new customers with lifestyle adjustment and behaviour modification as well as adapting to the new technology.

Figure 4.2

Historical Fuel Cost 2005 – 2010 and 2011 Budget



Despite the significant 1.5% reduction in losses last year, the fuel under-recovery suffered by JPS due to the penalty directly associated with not meeting the regulatory target for losses was US$24.8M, with a net under-recovery of US13M.

JPS projects that in 2011, the company will suffer a US$32.4M under-recovery on fuel directly attributable to losses and a net under- recovery of US$17M for the period July 2011 to June 2012 in the event that the losses target is lowered to 17.5% in 2011 by the OUR (See section 4.4).

This presents additional challenges. When combined with (a) the Company's inability to realise the revenue requirement due to lower energy sales arising from the macro-economic environment; and (b) increase in unplanned expenditure including tax increases and other fiscal measures, it places JPS at a significant financial disadvantage.

The Company is extremely concerned at the continued risk exposure faced by it due to the inability to fully recover its fuel cost due to system losses and the effect this has on its medium to long-term potential to continue to attract competitively priced capital. Creditors on the international capital market often express this concern.

The 2010 performance and achievement in reducing losses demonstrates JPS' unswerving commitment to effectively tackle this ingrained crime. The Company continues to confidently project that it will achieve an over-all reduction of 5.2% over the five years of the tariff period based on its current medium-term programme.

However, the Company must caution that a reduction in the losses target to 17.5% at this time would be precipitous and ill-timed. It would leave JPS with no option but to implement even more extensive and radical solutions primarily in Red Zone communities across the island where it is experiencing concentrated high levels of

losses. Some of these solutions will inevitably cause disruption and inconvenience to the few legitimate customers in these areas but would be unavoidable to achieve rapid reduction in the losses and prevent the financial haemorrhage of the Company that would otherwise occur. Some of these measures are outlined in Section 4.6.

Observations & experience of 2010

However, the experience garnered, lessons learnt and the range of the socio-economic issues that have emerged from the first year of implementation strongly cautions for a revision of the momentum with which further reduction in losses can be credibly sustained.

Some of these include:

- **Affordability & Delinquency:** While the company has been having success in stopping the physical theft of electricity in the areas in which the RAMI networks and meter centres have been deployed, this has highlighted new emerging and worrying issues. Many customers now legitimised are falling into serious arrears and delinquency. Others, such as indigents and the unemployed are at risk of losing electricity service without the means to pay for the service. While JPS is not in a position to address these issues, the Company is nevertheless extremely concerned at the threat this poses to undermine the sustainability of the loss reduction effort without appropriate social intervention. Any acceleration in the momentum of our initiatives is likely to further alienate and increase the level of frustration among these groups and risk fomenting social instability.

  It should be noted that a Notice of Motion has been tabled in the Lower House of Parliament seeking a debate on the implementation of RAMI projects in communities and the need to reach consensus between the social agencies of the state, the OUR, Government and JPS on a sustainable basis for reducing losses.

- **Hostility to personnel, threat to property and commercial operations**: Several employees and contractors have suffered abuse and hostility in red zone communities. The OUR, would be aware of multiple street demonstrations in affected communities and vehicles damaged. Increasingly commercial office staff and field officers are encountering increasing levels of hostility and abuse in carrying out their duties. Internally, the Company is facing increased resistance and concern from staff deployed to work and serve these areas subsequent to anti-theft initiatives. Acceleration of the loss reduction programme will require even more radical solutions than currently employed with the attendant risk of precipitating even more serious incidences.

- **Institutional and national capacity constraints:** There is a limit to the amount of employees JPS can hire, train and efficiently deploy and manage on an annual basis to do loss reduction activities, including third party contractors. Beyond a certain take-up rate to do otherwise would result in diminished returns and wasted resources. These issues also affect our primary partners in the infrastructure rollout — the Rural Electrification Programme (REP) and the Government Electrical Inspectorate (GEI).

- **Social Impact on RAMI implementation timeframe:** The 2010 experience has shown that there are many more activities required and several activities require a longer period than previously anticipated for success of the project. Several of these activities such as pre and post community engagement for example are of a social nature and the outcomes not entirely predictable. While these project components are often peripheral to the actual infrastructure build-out, they are mission critical and cannot be short-circuited if problems are to be avoided that could derail the immediate or future projects. The construction to cutover cycle for a red zone community can take anywhere between six months and a year depending on the number of households, level of hostility encountered and the prevailing socio-political climate.

4.1.3 Summary of Proposals

In light of the foregoing and against the background of the continued weak state of the Jamaican economy, the country's delicate social balance at present and the ominous trend in oil prices, JPS in proposing the following:

- **That the reset of the system loss target from 19.5% to 17.5% be delayed to the June 2012 annual tariff adjustment.** This regulatory action would complement the stability in tariff charges conveyed in this annual adjustment and provide economic and social space to mitigate the inevitable dislocations resulting from the loss reduction initiatives. For the sake of clarity, JPS is not in any way proposing to slacken on its reduction initiatives, a delay in the target reset would only avert the company having to resort to more radical solutions to prevent financial harm and possible social instability. JPS would still pursue initiatives aimed at reducing losses by a further 1.1% in 2011 that would still leave it short of even an unrevised 19.5% target. It should be noted that if this is achieved it would mean a reduction of 2.6% in two years. A reduction of a similar magnitude of 2.6% took five years (1995-2000) without achieving the regulatory target.

- The introduction of additional substantial penalties for electricity theft. To continue to strengthen the deterrence against electricity theft and complement the first proposal, JPS is also proposing that a penalty be attached to the unauthorized removal of the integrity seals of meters as well as for the act of stealing electricity. The penalty for the latter violation would go to a fund to finance the extension and improvement of electrical infrastructure for marginal communities across the island.

We urge the OUR, to give careful and considered consideration to these proposals. The following sections will provide supporting details of the 2010 performance and the objectives, initiative, targets and budget for 2011.

4.2 Review of 2010 Performance

4.2.1 Loss Reduction Objectives

Emerging from the Tariff Review in October 2009, JPS established a Division in November 2009 dedicated to the identification and reduction of System Losses. The Division headed by a Vice President with approximately 260 staff and a budget of US$30M for 2010 focused on the following priorities:

- Achieve a comprehensive and precise system for improved Identification and Measurement of Losses;
- Identify the drivers negatively impacting commercial electricity losses and coordinate the development of intelligence to support targeted inspection and investigation of irregularities;
- Dedicate significant resources to the actual investigation and regularization of suspected irregularities;
- Achieve significant growth in incremental consumption and/or reduction in unregistered consumption;
- Establish sustainable Commercial Processes that results in reduction of Non-Technical losses.
-

The Primary strategies for achieving the above-mentioned objectives are:

1. **Measuring**
   - Integration of Energy Balance Approach as part of JPS' routine operation to reduce energy loss on a sustained basis.
   - Monitor energy loss allocation between technical and non-technical.
   - Identification of high-loss feeders/ load centres.

2. **Intelligence**
   - Support targeted inspection of irregularities and improve strike rate through the use of intelligence.
   - Analysis of revenue assurance process.
3. **Targeted program based on the Customer Class**
   - Theft Resistant Network & Residential AMI
   - Proactive auditing and investigation to detect and control losses
   - Use of AMI for Priority Accounts (accounts for 43% of energy sales & 36% of revenues4.2.2 Activities

4.2.2.1 Identification and Measurement of Losses

Energy Balance Project

The priority for 2010 has been the completion of the Energy Balance Project; this initiative was integrated as part of JPS' routine operation to reduce energy loss on a sustained basis. The following was achieved during the year:

1. Completion of the metering of all 26 Net Generation points;
2. Alignment of all distribution feeders' energy loss with commercial parish boundaries (Frontier Metering)
   - Necessary to measure and monitor parish energy loss reduction performance;
3. Completion of the metering of all 110 Distribution Feeders
   - Alignment of meter reading routes with the installation of feeder sub-meters (total meters). This provides a tool to effectively and efficiently prioritize loss reduction initiatives and solutions, on a sustained basis and track and monitor performance on a monthly basis.

Central Intelligence Unit

The primary focus of the Intelligence unit is the identification of both internal and external factors negatively affecting billed sales and the development of intelligence to support targeted inspection and investigation of irregularities. The key activities of this unit include:

- Desktop and Data Mining - data analysis to determine which accounts/locations are to be targeted for investigations.
- Develop and implement analytical tools utilizing feeder balance metering to support targeted inspection of irregularities and improve strike rate through the use of intelligence.
- Monitoring and controlling the various internal processes that can negatively impact bill sales.

The Major Activities carried out in 2010 were:

1. **Monitoring of Large customers**
   - Prioritizing top 60k revenue customers (75% of revenues)
   - Analysis of consumption trends to identify marked drop in consumption.
   - Assign Standard Industrial Codes (SIC) to monitor consistency of consumption of similar enterprises.

2. **Feeder Based Initiative**
   - To produce a replicable and sustainable standard operating procedure for loss reduction based on high loss feeders. Allowing us to quantify losses at specific circuits on the feeder especially in the Red Zones.

3. **Process Control Initiatives**
   - Review of Meter Inventory Management
   - Review and Modification of Applications to support Loss Reduction Initiative. Applications cover the Meter Reading, Service Order Management and Billing processes that would cause accounts not to bill or bill properly.

4.2.2.2 Sustainable Loss Reduction: Residential Automatic Metering

This is aimed at "sustainable" loss reduction efforts where anti-theft networks such as RAMI and Meter Centers are utilized and once completed show an immediate and long-term reduction in overall losses. These projects aggressively target informal residential/inner city communities and clusters of informal commercial districts across the three largest "loss" parishes in Jamaica -Kingston, St. Catherine and St. James. Results in 2010 have shown that once these projects are completed they show an immediate and long-term reduction in overall losses. These initiatives are very time consuming and capital intensive, due to the level of planning, community intervention, home rewiring and certification as well as the network construction required; but offer the best return long term. One project can take up to a year to implement due to various external factors.

- The completed RAMI projects include Sea View Gardens, Old Harbour, Pitfour, Retirement, Hurlock and Tivoli Gardens and 30% of Denham Town equating to 8,500 customers. Meter center projects included Ocho Rios Market, Village Green, Faith's Pen, Ambrook Lane, Belair, Dam Head, Top Town, Tarrant Drive, Jobs Lane and Port Henderson Road.

- Collectively the projects have contributed approximately 12.5 GWh of additional sales and/or reduction in net generation or 0.39% contribution to the overall loss reduction effort at a cost of almost US$8M.

Below are the loss profiles of three Anti-Theft Projects done in 2010

Figure 4.3

Losses Reduced from 76.4% to 4.94% in Sea view Gardens

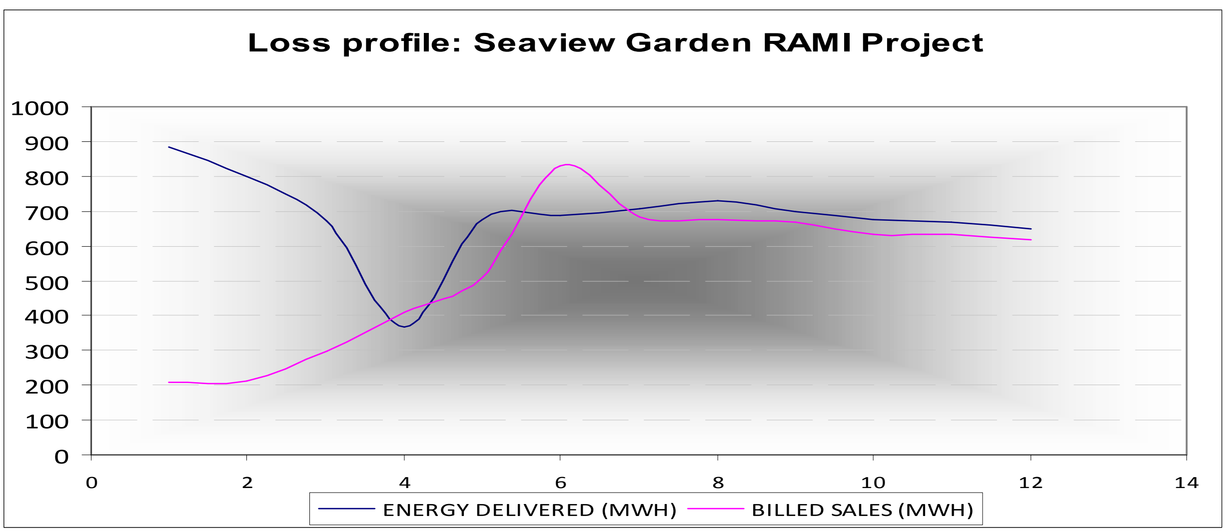


Figure 4.4

Losses reduce from 66.5% to 2.95% in Old Harbour Bay

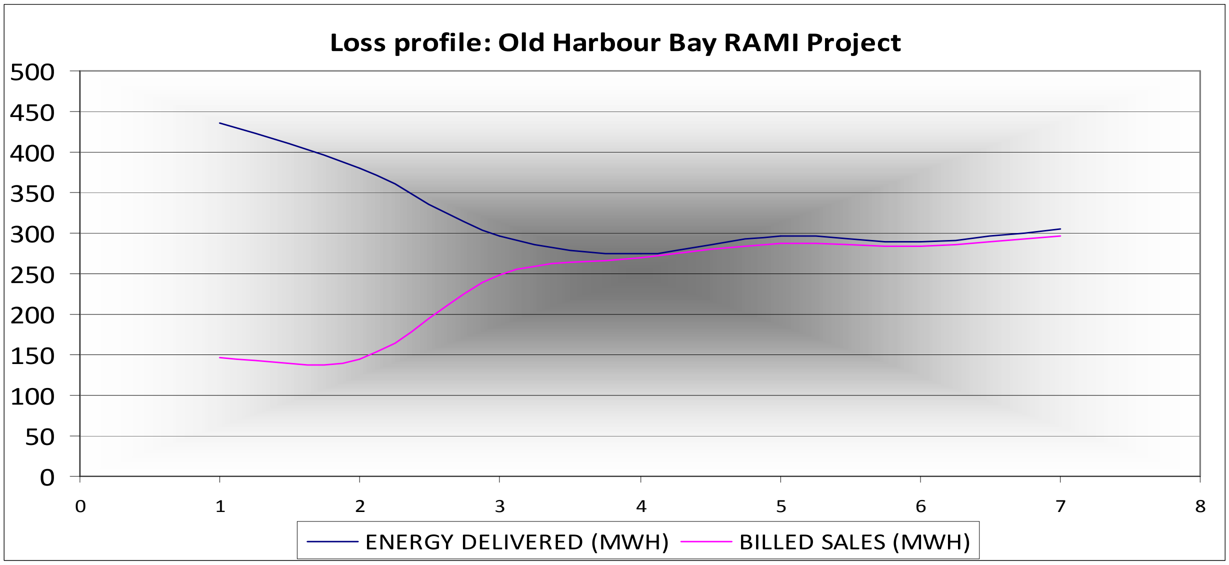
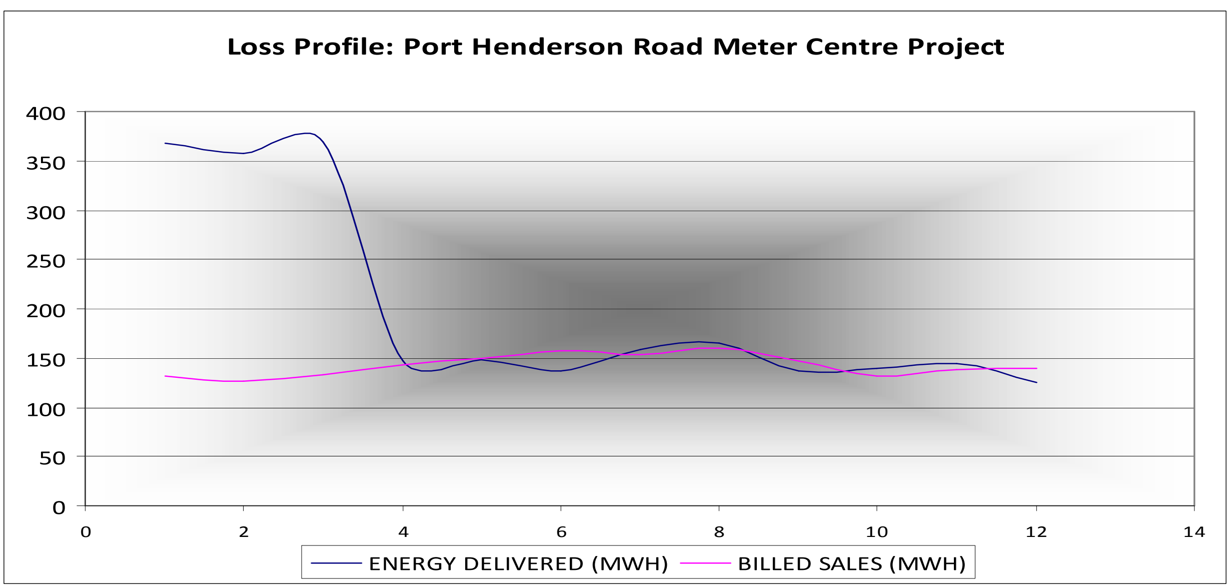


Figure 4.5

Losses Reduced from 64.4% to 4.8% in the Commercial District of Port Henderson (Back) Road



4.2.2.3 Analysis and Investigation of Accounts with Suspected Irregularities

This involves the analysis of accounts to identify those with potential irregularities and then conduct field investigation of these accounts. Suspected irregularities include meter tampering, direct connections, meter by-passes, etc. The work was divided and organized around customer groups based on monthly billed sales:

1. Large accounts – meters with multipliers greater than one (1) and with consumption greater than 1,000 kWh per month.
   - 8,732 accounts investigated; 1,028 identified irregularities with effective strike rate of 11.77% and recovery of 16.938 GWh.
2. Small commercial accounts– commercial accounts with meter multipliers less than one (1) and consumption less than 1,000 kWh per month.
   - 14,661 accounts investigated; 1,653 identified irregularities with an effective strike rate of 11.27% and recovery of 18.120 GWh.
3. Residential accounts
   - 113,480 accounts investigated; 22,185 identified irregularities with effective strike rate of 19.6% and recovery of 54 GWh.

The above approach, while necessary, is costly and labour intensive work that utilized approximately 200 personnel and cost over US$11M in O&M expense. As this work is not considered "sustainable" loss reduction, this recovery must be replicated year after year. It is obvious that the same level of financial and labour commitment will result in a diminishing return year over year as it becomes more and more difficult to find irregularities.

4.2.3 Achievements

Figure 4.6
JPS Net Generation, Sales & Energy Loss 2009 & 2010

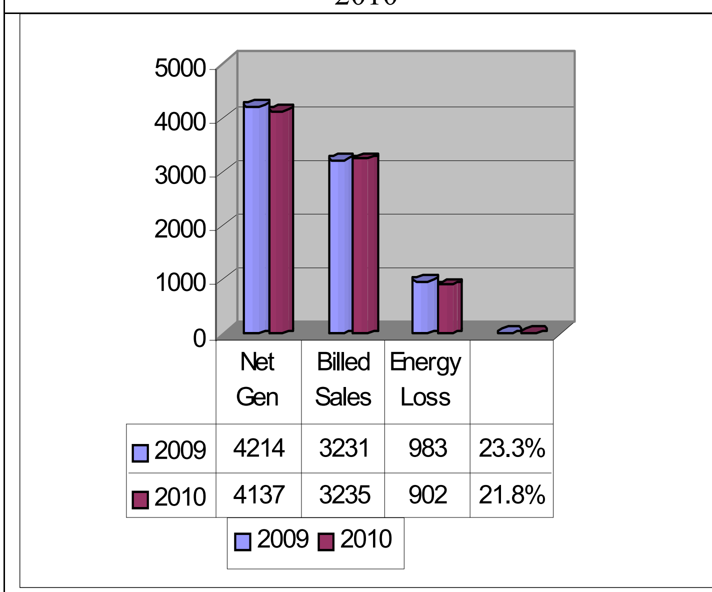


Table 4.1
2010 Fuel Costs & Revenues

	Total (2010)
Fuel Costs	**578,379**
Heat Rate	**11,766**
System Losses	**(24,810)**
Fuel Revenues	**565,335**
Surplus /(Deficit)	**(13,044)**

Figure 4.6 shows that in 2009, JPS Energy Loss was 982.5 GWh or 23.3%, the results of the 2010 was Energy Loss of 902.1 GWh or 21.8% JPS therefore achieved a reduction of 80.5 GWh or 1.5%. Despite this improvement, JPS incurred fuel penalty of US$13.0M in 2010 due primarily to a system loss penalty of US$24.8M (see Table 4.1 above). The system loss penalty arose from a combination of the basis used to calculate the penalty as well as the fact that despite the gain, system loss remains above the allowable limit of 19.5%. In respect to the former, fuel cost recovery is based on a rolling 12-month average and consequently JPS was only allowed to recover fuel costs based on a reduction of 1% (from 24% in 2009 to 23.0% in 2010 (Table 4.2 below).

Table 4.2

Details of JPS Systems Loss 2009 and 2010

		Billed			Normalized		
Period	Net Gen	Sales	Energy Loss	System Loss	Sales	Energy Loss	System Loss
2009	4,214	3,231	983	23.3%	3,204	1,010	24.0%
2010	4,137	3,235	902	21.8%	3,187	950	23.0%

Section 4.2 above outlines the comprehensive approach adopted by the Company through the dedication of a significant amount of resources committed to the loss reduction effort. Through a varied range of initiatives, JPS addressed the factors that were within its control however there were many uncontrollable variables that affected the Company's performance in 2010. These are primarily macro-economic and socio-political factors that are outside the control of the Company.

Macro-economic conditions including rising fuel costs that impact the system loss effort in at least two ways. Firstly as explained above, the propensity to steal electricity rises as electricity price increases. Secondly rising electricity price affects energy sales. Socio-political factors significantly impact the pace at which JPS is able to rollout sustainable loss reduction activities. Electricity theft is a crime and like many other criminal activities, its reduction and eradication requires a multifaceted approach including social intervention and the stimulation of economic activities. JPS through its corporate social responsibility outreach has expended significant amount of resources in augmenting its loss reduction activities with very limited social intervention projects but the Company is neither equipped nor has the resources to take on this challenge.

JPS projected a reduction in System loss of 2% and therefore did not achieve its target by 0.5%. The Company experienced several challenges that impacted the success of the Loss reduction efforts. These included:

1. Increase in the price of electricity driven by rising fuel price;
2. Reduction in energy sales especially among the low loss customers
3. Increased hostility towards the JPS loss reduction team in the execution of their job function
4. Socio-political conditions in areas where the greatest level of loss are being incurred.

4.2.3.1 Increase in the Price of Electricity

Average fuel prices rose by 25.5% in 2010 compared to 2009 (see Figure 4.2 above) and resulted in electricity prices increasing by approximately 20% despite the revaluation of the Jamaican dollar. Historically, the increase in electricity price results in a rise in system loss as confirmed in Figure 4.1 above. This has increased our exposure and vulnerability to irregularities beyond our control and the loss reduction team has seen many innovative attempts to illegally extract electricity from the network.

JPS continues to be aggressive in identifying and eliminating these exposures through measures such as increased audit and investigations, the creation of a registry of repeat offenders and greater amount of analytical tools to detect irregularities. However, without a regime of penalty that is an effective deterrent and with the pressure of rising electricity prices and decreasing sales due to economic conditions in general, the magnitude of work required to achieve a certain level of loss reduction has increased exponentially.

4.2.3.2 Reduction in Energy Sales

Figure 4.7

Billed Sales without Adjustment (MWh)

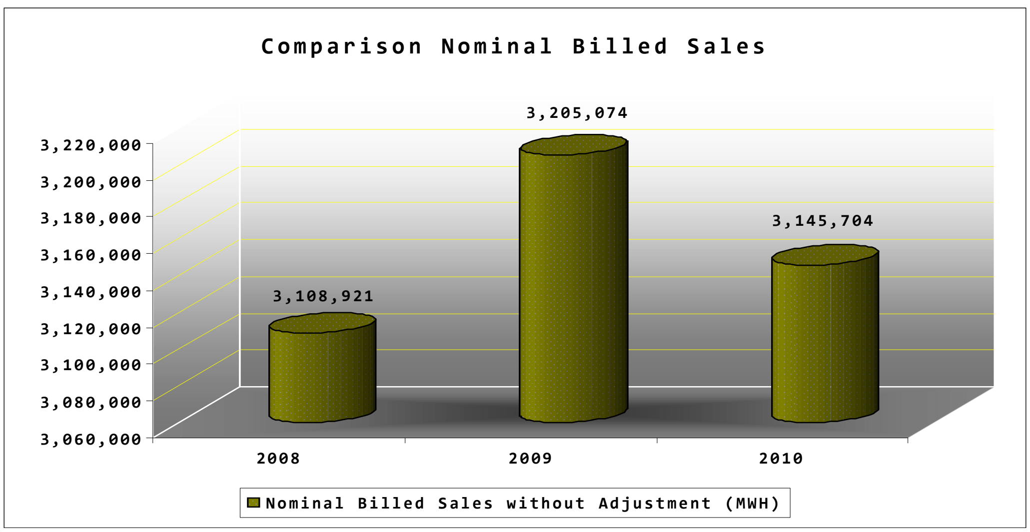


Table 4.3

Comparison of Bill Sales excluding Loss Recovery adjustments (2009 vs. 2010)

Year	Billed Sales with Adjustment (MWH)	Adjustment due to Energy Recovery (MWH)	Nominal Billed Sales without Adjustment (MWH)	Movement Yr over Yr
2008	**3,129,903**	**20,982**	**3,108,921**	
2009	**3,231,465**	**26,391**	**3,205,074**	**96,153**
2010	**3,235,236**	**89,532**	**3,145,704**	**-59,370**

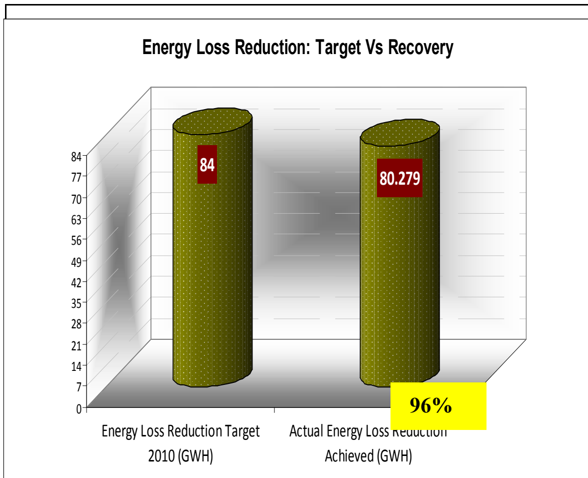
As highlighted in Table 4.3 above, energy sales for 2010 was 3,235 GWh an increase of just 0.12% over 2009. Included in the energy sales was 89.5 GWh of loss recovery adjustments (compared to 26.4 GWh in 2009). Consequently energy sales (excluding loss recovery adjustments) actually experienced a 1.85% decline in 2010. Net generation declined by 1.82%. This lack of growth impacted the actual system loss achieved in the following ways:

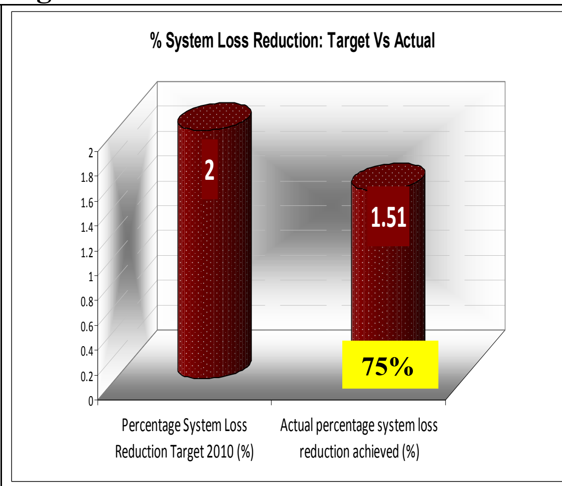
1. Using the 2009 Net generation, a 2% reduction was targeted. This equates to 84 GWh. Actual reduction in energy loss was 80.5 GWh. This 80.5 GWh was 1.91% of the net generation. Despite this however, system loss declined by only 1.5% from 23.3% to 21.8%;

2. The reduction in energy sales was experienced primarily among commercial customers, the categories with the lowest level of energy loss.

Figure 4.8

Loss Reduction 2010 Target vs. Actual





Energy Loss Reduction Target 2010 (GWH)	Actual Energy Loss Reduction Achieved (GWH)	Percentage of Target Achievd	Percentage System Loss Reduction Target 2010 (%)	Actual percentage system loss reduction achieved (%)	Percentage of Target Achieved
84	**80.279**	**95.57%**	**2**	**1.51**	**75.50%**

Reduction in Commercial Energy Sales

The combined large customer group (Rate40/50) experienced energy sales reduction of 20 GWH in 2010 (see Table 4.4 below). During 2010, fifty-seven (57) RT40/50 customers were rendered inactive and this contributed to a decline in consumption of 10.1 GWh in 2010 (compared to 3.1 GWh in 2009).

Table 4.4

Billed Sales by Rate Class (MWh)

	Rate 10	Rate 20	Rate 40	Rate 50	Rate 60	Other	Total
2009	1,091,903	670,030	777,643	594,625	70,389	26,875	**3,231,464**
2010	1,106,956	673,471	750,291	602,248	71,029	31,242	**3,235,236**
Change	1.38%	0.51%	-3.52%	1.28%	0.91%	16.25%	**0.12%**

40 Large accounts RT40/50 accounted for 46 % (58 GWh of 126 GWh) of the reduction in billed sales for 2010. These accounts declined by 500 MWh or more for 2010. The top 5 decliners that account for 22 GWh of the decline are:

- Caribbean Cement contributing **- 6.4 GWh**
- MBJ Airport **- 6.2 GWh**
- Jamaica Broilers Port Esquivel-Ethanol **- 3.6 GWh**
- Jamaica Broilers White Marl **- 3 GWh**
- Tropicana Sugar **- 2.8 GWh**

22 top large accounts contributed to declining billed sales for three consecutive years. (2008 to 2010) This contributed to a 35% reduction in this category of customers. A decline of over 1 GWh in consumption for each of these accounts was noticeable in 2010 compared to 2008, (total of 82 GWh). These accounts contributed (230 GWh in 2008, 186 GWh in 2009 and 148 GWh in 2010). The top 4 decliners were:

- Windalco Kirvine contributing **- 20 GWh**
- Caribbean Cement **- 7.9 GWh**
- Red Stripe **- 5.8 GWh**
- MBJ Airport **- 4.4 GWh**

4.3 2011 Outlook

4.3.1 Loss Control Objectives: 2011

Building on the gains realized in 2010, JPS has established five major goals for 2011, namely:

a. Proactively manage non-technical system losses to achieve at least a 1.1% reduction.
b. Installation of additional metering points to install Total & Frontier Meters to cover Red Zones by the end of 2011.
c. Continue anti-theft metering and network construction in high-loss areas in residential and commercial areas where the cost benefit analysis is most justified.
d. Improve Revenue Assurance Process by continuing the development and institutionalization of operating standards and procedures specifically relating to metering installations and integrity of the energy sales process.

e. Improve the institutional capacity of the loss control organization to manage/analyze meter data and the demands of an expanding residential and commercial AMI infrastructure.

These major goals will be realized through the same three key strategies executed in 2010 (See Section 4.2 above). The main focus of the Division in 2011 will be to build on the knowledge and experiences gained in 2010 in measurement and control of non-technical losses, the auditing of customer accounts and the construction and installation of tamper resistant infrastructure by:

a. Improving the identification and measurement of non-technical systems losses Island-wide by completing 60% of the metering installation of the metering of the 134 classified high risk and volatile communities by year end.
b. Continuing to improve on various analytical tools and approaches in identifying and addressing both internal and external factors negatively impacting billed sales. This will be done through continued development and institutionalization of operating standards and procedures for the Revenue Assurance Process specifically relating to degraded meters, metering installations and integrity of the energy sales process.
c. Installing Residential AMI (RAMI) meter infrastructure and meter centres.

4.3.1.1 Improving the Identification & Measurement of Losses

JPS will continue its efforts to improve its ability to identify and measure energy loss throughout the spectrum of power delivery activities. The installation of revenue class meters at all net generation points was completed in early November 2010. To date JPS has spent approximately US$ 600k on metering feeders and has completed the energy balance metering on 103 feeders to help identify where losses are concentrated.

The primary focus for 2011 will therefore be:

a. Alignment of all distribution feeders' energy loss with commercial parish boundaries;
b. Installation of revenue class meters to cover 80 high loss areas (or Red Zones);
c. Installation of a further 2,100 AMI meters for large & medium-sized customers;
d. Replacement of old energy balance meters and complete remote communication link;

Table 4.5

Metering and Special Project Capital Expenditure (2011-2015)

		Costs (US$'000)				
	2011 Quantity	2011	2012	2013	2014	2015
Replacement of Degraded Meters	35,000	2,000	0	0	0	0
Installation of C&I Meters	2,500	50	0	0	0	0
Replacement of C&I Meters	50	300	0	0	0	0
Testing & Recording Equipment		110	500	500	500	500
Total		**2,460**	**500**	**500**	**500**	**500**

For the period 2011-2015, JPS will spend approximately US$4.7M (See Table 4.5 above) on capital expenditure, the most significant spend will be in 2011 in completing the meter degradation project costing US$2M.

4.3.1.2 Implementation of the Meter Degradation Replacement Project

Between April and December 2011, JPS will be replacing approximately 35,000 electro-mechanical meters that were installed prior to 1995. This is being done as, over time, meters slow down and do not reflect the actual energy usage of customers. Although JPS has been gradually introducing electronic meters incrementally into the system for several years, the Meter Replacement Project represents a more structured and extensive deployment of these meters.

4.3.1.3 Quantifying Losses in Red Zones

Tools have been developed to further identify on each feeder where and at what level losses are occurring. This initiative is based on a method of analysis, investigation and regulation to produce a replicable and sustainable standard operating procedure for loss reduction based on high loss feeders. It allows us to quantify losses at specific points on the feeder especially in the Red Zones. A Red Zone is an area where the socio-economic condition is very poor. These areas pose a high security risk to JPS workers to carry out normal commercial activities to read meters, disconnect for non-payment and carry out loss reduction efforts. These areas typically have a high concentration of illegal connections, which is usually manifested in throw-ups, line taps, direct connections, bypasses etc. In the past year a concerted effort was placed on the Constant Spring 210 and Washington Blvd 310 Feeders to develop this analysis tool.

Table 4.6

Feeder Base Initiatives

Feeder Base Initiatives - Pilot Projects

Feeder Name	Energy Delivered (MWH)	Billed Sales (MWH)	Losses (MWH)	Total Energy Delivered (MWH)	Total Billed Sales (MWH)	Total Red Zone Loss (Mwh)	% Red Zone Losses	% Of Feeder Losses
Feeder Data				Red Zones Data				
W/Boulevard310	3,871	2,400	1400	1177.54	337.67	839.87	71.3%	60%
Constant Spring210	4,247	3,019	1,228	1722.14	255.55	1125.00	65.3%	92%
Grand Total			2,628	2,900	593	1,965	67.8%	75%

In an effort to preserve economic viability and to curtail energy loss we have begun to quantify the levels of losses being experienced in 134 large areas classified as Red Zones and to strategically target those areas with high loss measurements for the streamlining of sustainable loss reduction solutions. To date 43 Red Zones across 29 feeders have been quantified and show the following impact:

Table 4.7

Potential impact of Red Zones on Losses

Overall Company Losses (MWH) Annualized	**902,000**
Quantified 43 Red Zones Losses (MWH) Annualized	**91,908**
Projected 91 Red Zone Losses (MWH) Annualized	**169,236**
Total Red Zone Losses (MWH) Annualized	**261,144**
Red Zones as a % of Company Losses	**28.95%**
Areas Over 90 days	**J$93,000,000**

Projecting the above impact across the remaining 91 Red Zones shows the overall potential impact on company losses is a minimum of 28.95%: *(See Appendix IV)*

These represent the currently identified large Red Zones on each feeder and not necessarily the total number of Red Zones that might be on a particular Feeder. For example, on our Washington Blvd 310 pilot feeder we initially had three identified large Red Zones. However, upon further analysis, an additional 21 Red Zone areas were identified accounting for 50% of overall losses on the Feeder and 21% on the originally identified three (3) Red Zones.

JPS' current sustainable loss reduction efforts such as Meter Centres and RAMI require significant time and capital to address. To achieve a 5.2% loss reduction as targeted over the next several years and based on the above analysis indicates JPS must become much more aggressive in these Red Zone areas to meet our targets and this would require significantly radical solutions if the lowering of the target begins to markedly outpace the rate at which actual losses can be lowered.

4.3.1.4 Intelligence Unit: 2011

JPS has a dual approach to identifying and measuring Energy losses. The Metering and Special Project Unit focuses on measuring through metering by using an Integrated Energy Balance Approach across the entire Power Delivery spectrum. The second leg of the Loss Identification and measuring approach involves the constant monitoring and analysis of processes and systems by a Central Intelligence Unit. This Central Intelligence Unit has two primary objectives, namely:

a. Identifying the drivers that are negatively impacting commercial electricity losses. Drivers include electricity theft, metering issues, billing issues and internal processes.
b. Coordinating the development of intelligence to support targeted inspection and investigation of irregularities.

The Central Intelligence Unit will continue its approach of improving the Revenue Assurance Process through Data and Process Analysis. This will be achieved through supporting the monitoring of large customers, as well as the feeder and process based initiatives with six key activities. These are:

1. Create a functional Meter Data Management and Control Centre;
2. Complete audit and certification of 100% of C&I customers by end of 2011;
3. Create and monitor registry of repeat offenders;
4. Implement a Business Intelligence & Analytical Tool which will help with comparative analysis within and across various industries/sectors;
5. Implement a Seals Management Program;
6. Process Analysis;

Meter Data Management and Control Centre

The main objectives are as follows:

- Improve the capacity of the loss control structure;
- Manage Meter Data and the demands of an increasing residential and commercial AMI infrastructure;
- Increase organizational efficiency in tackling losses;
- Reduce time and costs involved in the detection and correction of irregularities;
- Maximize the returns on current and future AMI projects.

Developing a Meter Data Management and Control centre involves identifying and training analysts and technicians to discharge the function and procure and install hardware and software for the Meter Data Management System (MDMS). The MDMS is a repository and analysis tool for data related to C&I, AMI and RAMI.

Business Intelligence & Analytical Tool

A business intelligence tool will be developed, to support data analysis and the automation of some manual processes. The business intelligence is expected to be available the first half 2011.

Implement Seal Management Program

The Seal Management Program is expected to be complete in 2011, this is aimed at facilitating the upgrade of all meter seals (new residential seal are bar coded) to increase tracking and controls over the movements of meters and seals; and to ensure the security & general management of large accounts. This will:

- Improve the I.T infrastructure for meter and seal management.
- Develop and implement standards governing meters and seal management, account investigations, account adjustments and documentation standards.

Process Analysis

- Customer to feeder analysis, which is closely, linked to GIS data. The aim of this activity is to quantify loss at the various sections of our Top 10

Feeders and other targeted areas identified by CPC and RPD through a process of measurement, validation and analysis

- This activity is designed to help us to more effectively focus our resources on the recovery of losses and will help LCD to prioritize areas for RAMI, meter centre projects and other loss reduction strategies.
- Validate the boundaries and analyze the losses in the 134 Red Zones island-wide to prioritize the total metering project and implementation of Anti-Theft loss initiatives.
- This will help to further understand and develop a plan to address the remaining losses on targeted feeders.

4.3.1.5 Auditing & Investigation of Accounts

Table 4.8

Investigations and MWh Recovery 2010 & 2011

	2010	2011
	Full Year	Full Year
# Of Investigations	136,873	120,000
Irregularities	24,866	22,800
Strike Rate	18.2%	19.0%
MWh Recovered	89,532	55,000
Value of Recoveries (US$'000)	26,041	16,142

The Commercial Process Control unit's primary role is to conduct targeted audits, inspections and corrections of customer accounts with the aim of protecting the company's revenue. The main strategies for 2011 include:

- Development and Institutionalization of operating standards and procedures for the Revenue Assurance Process, specifically relating to metering installations and integrity of the energy sales process.
- Improved ability to detect irregularities.
- Reduced exposure to Regulatory penalties.
- Audit or investigate at least 120,000 accounts by the end of 2011, with a projected strike rate of 19%, and is expected to yield of approximately 55,000 MWH in recovered energy. (See Table 4.8above).
- Incorporate adherence to standards as a performance measurement criteria.
- Automation of various customer account/group manual data collation metrics to increase the efficiency of data analysis
- Route Sales Analysis and Trending, which involves identifying routes which have shown flat or downward trends in sales;
- Targeting of routes and or communities with high arrears and gated communities in high end areas for identification of meter tampering;
- Formation of a core construction team within the unit with linesmen, who will be involved in construction of Anti Theft Network (Pole mounted Meter Centre) in high loss non-violent communities.

4.3.1.6 Residential Automated Metering Infrastructure

The main objectives of the RAMI projects are to:

1. Complete 17 inner-city communities by December 2011.
2. Connect approximately 22,000 new customers during 2011.
3. Ensure Projects are completed within the budget of $12.98M.
4. Educate inner city communities about energy conservation, usage and value.
5. Reduce annual losses in 2011 by 0.6%, as all project benefits will start after July 2011.
6. Install Commercial Tamper Resistant Meter Centres covering 100 customers island wide.
7. Install Residential Tamper Resistant Meter Centres covering 1,500 customers island wide.

For the RAMI projects completed in 2010, JPS will see full benefit in 2011, this will contribute 1% of total energy sales growth for 2011. Likewise full loss reduction benefits of 2011 projects will not be realized until 2012. Table 4.9 below gives an indication of the projects targeted for completion in 2011, the number of new customers and metering points to be added and the associated capital budget

Table 4.9

LCD-RAMI 2011 Plans-Summary

Location	Month (GWh)	System Losses	Metering Points	# of New Customers	Budget US$M
St. Andrew South/West	1.8	0.52%			3.96
Payne Land			2500	2250	
Greenwhich Town			1500	1350	
Whitfield Town			3000	2700	
Jones Town			1200	1080	
Arnett Gardens			900	810	
Torrington Park			400	360	
Queens Drive 310	1.3	0.37%			2.27
Flankers			3000	2700	
Providence Heights			1500	1350	
Queens Drive 710	1.2	0.34%			2.87
Norwood			1500	1350	
Salt Spring			1200	1080	
Cantubuy			550	495	
St. Catherine	1.3	0.37%			2.61
Central Village			3000	2400	
Tawes Pen			500	450	
Red Pond			500	450	
Gordon Pen			1200	1080	
Kingston West	0.7	0.20%			1.27
Hannah Town			800	720	
Flethers Land			1200	1080	
TOTAL	**6.3**	**1.80%**	**24,450**	**21,705**	**12.98**

Timeline to Implement a RAMI Project

Figure 4.9

Timeline for 2011 RAMI Projects

RAMI 2011 SCHEDULE OF ACTIVITIES - OCTOBER 10 TO DECEMBER 2011															
ACTIVITIES	**Oct-10**	**Nov-10**	**Dec-10**	**Jan-11**	**Feb-11**	**Mar-11**	**Apr-11**	**May-11**	**Jun-11**	**Jul-11**	**Aug-11**	**Sep-11**	**Oct-11**	**Nov-11**	**Dec-11**
Design	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxxx									
RAMI (Project) Approvals				xxxxxxx	xxxxxxx										
Pre-Community Engagement		xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxxx									
REP House Wiring							xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxxx			
Pole-line Construction					xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxxx			
Arrival of RAMI Meters											xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxxx	
Meter Installation & Cutover								xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx
RAMI Back-office Support				xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx	xxxxxxx
Post Community Engagement									xxxxxxx	xxxxxxxxxxxxxxxxxxxxx			xxxxxxx	xxxxxxx	xxxxxxx

Even though these projects contributed 12.5GWh of recovery (0.3%) to JPS in 2010, it could have been more if it was possible to finish all of these projects on January 1, 2010 in order to get the full benefits of each project in 2010. For example if all of these projects were completed in January 2010, then JPS would have achieved a recovery of 26.6 GWh or 0.65% of 2010 loss reduction from anti-theft projects. In other words JPS loss reduction in 2010 would have been 1.86% rather than 1.51% as it pertains to the anti-theft projects only. Below is a typical timeline to complete a RAMI project and the main activities involved. The timelines are such in order to minimize social unrest and resentment from residents, political representatives or any other stakeholders from each community.

JPS' strategy is to do as many RAMI/Anti-Theft projects as possible in parallel with the limited financial and human resources available.

By the end of May 2011, JPS expects to complete Denham Town, Newlands, Naggos Head, Rose Town, Rema and sections of Trench Town, which could add another 7000 customers to JPS. Other areas to be converted by end of 2011 include Arnett Gardens, Payne Land, Whitfield Town, Greenwhich Town, Arnett Gardens, Flankers, Providence Heights and Central Village equating to a further 15,000 potential customers to be transferred to RAMI. In total, JPS expects to convert approximately 22,000 users to customers in 2011 at a yearly loss reduction benefit of 57GWh or approximately 1.40*%. With that said, JPS losses is projected to be at 20.7% at the end of 2011 assuming net generation remains consistent and JPS does not lose any large "no loss" customers.*

The construction to cutover cycle for a new community takes anywhere from six (6) months to one year depending on the volume of households, crime rate and the socio-political climate. For example, the Old Harbour Bay community with 1,200 households took five (5) months to complete while the Denham Town project with 3,200 customers is in its eleventh (11th) month since commencement. The timelines can be significantly different depending on the level of instability in the communities and indeed in the country at any given time. It's important to note that these projects require a high level of support from private security personnel in addition to the traditional support from the police. There is a very delicate balance that must be obtained as persons in the affected communities can easily become incensed as JPS is implementing changes that will directly affect their livelihood and personal property. We are happy to announce that there have been no deaths directly associated with our activities thus far but we must warn that we are operating in very volatile communities with a high security risk to our staff and contractors carrying out these various initiatives.

Faced with a 2% reduction in its regulatory losses target after 18 months, JPS would have no choice but to reconsider the value of the time, money and effort being expended to minimize the social impact of the projects on residents in the affected communities. However, the Company's considered view is that the other options available are likely to create significant social unrest, put the lives of our staff at greater risk and would be self-defeating to the medium term objective of reducing system losses.

JPS will invest US$44.68M on capital expenditure over the next five-years on RAMI projects. The major expenditures will be in 2011 of US$12.9M and approximately US$8M per annum thereafter and adding approximately 15,000 customers per annum.

4.3.2 Projected Outcome

The first two months of 2011 has seen a significant increase in the price of oil and the prospect for further economic stagnation. Geopolitical and other events have heightened the expectation for a continuation of this trend throughout 2011. This will make the climate for achieving system loss reduction even more difficult. Despite this however, JPS projects to continue to reduce System Loss and a 1.1% reduction is projected for 2011 (see Table 4.10 below).

Table 4.10

System Loss Projection for 2011/2

		Billed			Normalized		
	Net Gen	Sales	Energy Loss	System Loss	Sales	Energy Loss	System Loss
2010	4,137	3,235	902	21.8%	3,187	950	23.0%
2011	4,108	3,258	850	20.7%	3,230	878	21.4%
2011/12	4,112	3,291	822	20.0%	3,259	854	20.8%

The confidence of continued Loss reduction success is predicated on the approach and work programme for 2011. This approach will be centred on two key strategies:

1. Significant improvement in the intelligence utilized
2. Greater emphasis on sustainable Loss Reduction activities and in particular the RAMI projects.

Further success is anticipated for the first half of 2012 and the Company realized the benefit of its programme. System Loss is projected to reduce to 20% by June 2012.

4.4 Fuel Cost Recovery

Table 4.11

Fuel Cost Recovery Projections 2011/12

	Jul '11 - Sept '11	Oct '11 - Dec '11	Jan '12 - Mar '12	Apr '12 - Jun '12	Total
Projected Fuel Costs	182,904	169,834	165,295	173,683	**691,716**
Heat Rate	1,653	6,568	5,687	1,428	**15,336**
System Losses	(9,221)	(8,216)	(7,773)	(7,196)	**(32,405)**
Projected Fuel Revenues	175,335	168,187	163,209	167,915	**674,646**
Surplus /(Deficit)	**(7,568)**	**(1,648)**	**(2,086)**	**(5,767)**	**(17,070)**

JPS under-recovered fuel costs by US$13.4M in 2010. This was directly due to the US$24.2M penalty associated with not meeting the regulatory target for system loss, a situation that the Company has not been able to remedy in over 15 years due to Jamaica's socio-economic environment. Despite the projected improvement in system loss during 2011, JPS projects that it will under-recover on fuel by US$17.1M. This projection is conservative and could realistically be exacerbated if the current volatility in oil markets buoy oil prices at current levels or drive them higher.

JPS does not expect that the Company can achieve a 19.5% target, let alone a lowered target to 17.5% even with its best effort in 2011. The lowering of the target therefore will only serve to amplify the fuel penalty of the Company and so deprive it of revenues needed to maintain the momentum on losses and address other customer issues.

4.5 Revenue Challenges

Impact of Government Fiscal and Tax Policies

In addition to flat and declining energy sales due to the stagnating economy, JPS is nevertheless faced with significant increase in operating costs that are outside its control. One major component of expenditure is taxation resulting from the fiscal measures introduced by the Government of Jamaica last year.

Many of these measures have impacted JPS, some directly and others indirectly, some of which include:

1. An increase in the General Consumption Tax rate from 16.5% to 17.5%, having an impact of approximately US$1M;
2. The introduction of GCT on Imported Services. This will result in a 17.5% increase in the costs of several items and activities including insurance, generation maintenance services and software license fees, having an estimated annual impact of US$3M;

3. Increase in Tax on Petroleum products. Effective **January 1, 2010**, the ad valorem component on prescribed petroleum products has been re-implemented at a rate of 15%. This will increase JPS' annual transportation expenses by approximately US$150K;
4. The introduction of GCT on electricity charges which impacts JPS when it is collected on behalf of the Government and when it pays a fee to collection agencies. These fees will increase by approximately US$277K per annum inclusive of taxes.

The government's fiscal policies have also impacted JPS indirectly. Several government agencies have revised their "user fees". Bill delivery through the government postal service for JPS has seen an increase in postal rates of approximately 150% between June 2009 and May 2010.

It should be noted that at the time the GOJ introduced GCT on electricity services it amended the GCT regulation to prohibit JPS from offsetting its input GCT, as would be the case with other companies. JPS therefore absorbs all the GCT it pays on goods and services.

Furthermore, a 10-year waiver on import duty and GCT on imported Generation and T&D material and equipment expired at March 31, 2011. Of critical importance, is the fact that the 2009 Rate Determination had no provision (except a Z-Factor claim) to absorb the impact of the waiver not being renewed.

These unplanned expenditures further highlight the deleterious impact lowering of the losses target at this juncture will have on the Company's finances

4.6 Accelerated Loss Reduction Initiatives Available to JPS

4.6.1 Possible High-Loss Zone Options

The current medium-term loss reduction programme has demonstrated that it can achieve credible and meaningful reduction in losses. It however requires a reasonable timeframe within which to achieve this without accompanying major social upheaval and dislocation. JPS has examined other options available to the Company in the event it has to move to an accelerated programme because of a sharp reduction in the target so as to preserve the Company's financial viability. These options include:

4.6.1.1Peak Power Curtailment on High Loss Feeders

The illicit use of energy, in high loss areas causes high non-technical losses to the system and the quantum and cost of the losses are higher during the peak hours.

During the peak demand hours JPS often needs to run the costlier gas turbine units (GTs) to meet the demand. The additional cost of these units is borne by all JPS customers. To manage demand and losses in these areas JPS would have no option but to curtail power to these high loss prone areas during the peak hours, which would give JPS the flexibility of controlling the system demand so as to minimize the use of peaking units and hence control fuel cost. This will in turn reduce the cost of fuel charged to legitimate JPS customers and the fuel penalty due to losses.

4.6.1.2 Load Limit Fusing

Load limit fusing involves determining the electricity delivered to these high loss areas during peak times and installing line fusing that open the circuit when the electricity delivered exceeds a certain threshold or limit and interrupt the flow of electricity to the area. Electrical supply can only be resumed when electrical consumption is reduced below the threshold allowed by the fuses when the fuses are physically replaced. De-energization of network segments

4.7.1.3 De-energization of network segments

In areas where there are pre-dominantly more illicit consumers than customers and due to the urgency to realize lower losses there is insufficient time to theft harden the network through programmes such as RAMI, the Company may have to resort to de-energizing sections of the network and so reduce the losses hemorrhage. In those instances we will seek to ensure, as best possible, that legitimate customers have an alternative power source.

4.7 Additional Penalty Proposal for Electricity Theft

JPS physically reads over 550,000 meters per month. With the use of the hand-held meter reading device and the software supporting it, the meter readers can report and we can capture a multitude of issues ranging from broken meters to safety issues to locking band seals missing. One obvious check every month is whether a meter has a coloured installer seal installed and intact on the outside meter-locking band. Lack of this seal on the locking band is an immediate flag that there is potential intrusion either in the meter itself, a by-pass in the meter base/metering structure or the opportunity for the meter to be inverted causing under-registration in the amount of kWh used.

But because there is no control or penalty associated with the removal of the seal, the meter - the measurement point, the integrity of which is critically important to both the customer and JPS, is open to the opportunity of tampering.

During the year 2010 Meter Readers reported **68,000** unique meter locations where the outside locking band did not have a seal. This equates to approximately **12%** of meters and this we consider to be a conservative estimate.

A penalty applied to the removal of seals would communicate clearly and effectively the importance of the integrity of the seal to the verification of the meter's integrity.

Once that penalty is in place JPS could implement a cost effective program to reseal all meters across the island in parallel with a communication plan to educate customers. JPS would then have an effective method to immediately identify and respond to potential theft.

4.8 2011-15 Budget

Table 4.12

Loss Reduction Budget 2011-2015 (US$'000)

	2011			2012	2013	2014	2015	2010 - 2015		
	Capital	O&M	Total	Total	Total	Total	Total	Capital	O&M	Total
Metering										
(1) Meter Degradation: Replacement of 40,000 meters	2,000		2,000	-	-	-	-	2,000	-	2,000
(2) C&I Meter Installation/Replacements	-		-	110	110	110	111	441	-	441
(3) Replacement of old Energy Balance meters/ Complete remote communication link	55		55	-	-	-	-	55	-	55
(4) Other Metering Activities		431	431	512	544	579	616	200	2,481	2,681
(5) Testing & Recording Equipment	110		110	500	500	500	500	2,110	-	2,110
Residential AMI & Meter Centers (Residential & Commercial)	12,980	241	13,221	7,958	7,976	8,225	8,485	44,479	1,386	45,865
Auditing/Investigation of Accounts & Meter Replacements								-	-	
Meter Replacements	200		200	-	-	-	-	200	-	200
Auditing Of Residential Customers		4,400	4,400	4,720	5,050	5,404	5,782	-	25,356	25,356
Safety & Security Services		140	140	150	161	172	184	-	806	806
Large Account Audit		2,104	2,104	2,257	2,415	2,584	2,765	-	12,123	12,123
Other/General Account Audits		3,252	3,252	3,489	3,733	3,995	4,274	-	18,744	18,744
Rpd Operations		1,120	1,120	1,201	1,285	1,375	1,472	-	6,453	6,453
Central Intelligence & Process Control			-	-	-	-	-	-	-	-
Meter Control Centre	647		647	-	-	-	-	647	-	647
Seals	50		50	-	-	-	-	50	-	50
Customer Account And Data Management		470	470	504	540	577	618	-	2,709	2,709
Other Administrative Expenses			-	-	-	-	-	-	-	-
Pr Campaign		661	661	709	759	812	868	-	3,808	3,808
System VARS Management	-		-	50	100	100	50	300	-	300
Theft Resistant Distribution Network & Metering (Polemounted Meter Centre)	-		-	1,430	1,430	1,470	1,516	5,846	-	5,846
	16,042	**12,817**	**28,859**	**23,590**	**24,603**	**25,903**	**27,241**	**56,328**	**73,868**	**130,196**
Capital Expenditure			16,042	9,840	9,890	10,160	10,396			
O&M Expense			12,817	13,750	14,713	15,743	16,845			

4.9 Fuel Cost System Losses Adjustment

The 2009 Tariff Determination on System Loss (See Section 4.1.1 above) proposes a reset of the System Loss target to 17.5% effective July 2011. JPS however, is proposing a twelve-month delay in this target based on the following:

1. The implementation of sustainable loss control measures requires a significant period (Please see Section 4.3.1.6 above) which is impacted by several potentially challenging variables including socio-political factors;
2. The methodology (rolling 12 month average) used for computing fuel costs recovery delays the recognition of the system loss improvements;
3. The Company's system loss efforts is challenged by macroeconomic conditions;
4. JPS' ability to absorb a significant fuel penalty has been affected by other challenges that the Company has experienced (See Section 4.5 above);
5. As a consequence of the Company's inability to absorb a significant fuel penalty, JPS will be forced to modify it approach to reducing losses (See Section 4.6 above). This would result in significant social unrest.

JPS has managed to achieve a reduction of 1.58% in losses in 2010 under its fresh approach medium-term programme. The Company is achieving its objectives but recognises that the pace of the reduction must be carefully balanced to take account of the prevailing socio-economic environment. An accelerated pace of reduction raises the serious prospect of social instability as demonstrated in communities in which the Company has already intervened.

The OUR, at the 2009-14 Tariff Review opted to review the losses target annually setting the first target reset for June 2011. At the time neither the OUR, nor JPS was aware of the many issues that would emerge from the implementation of the new programme. Given the success and challenges of the 2010 implementation JPS has proposed that the OUR evaluate the issues presented in this submission with a view to holding the system loss target at 19.5% for a further year. This will provide for the continued implementation of the current programme at a pace that will not precipitate social instability or cause the Company financial distress.