Public Electricity Supply Licensees Reporting Obligations Procedures and Guidelines

Final Decision on Reporting Requirements

ES: 10/2020

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1 INTRODUCTION

This section outlines the final reporting requirements obligations and the guidelines for submission of information to URCA by the specified licensees.

1.1 REPORTING REQUIREMENTS FOR PUBLIC ELECTRICITY SUPPLIERS

URCA has determined that Public Electricity Suppliers (PES) shall submit information and data relating to their performance to URCA in the manner and form (including by the date or dates) required by these Procedures and Guidelines.

The information and data to be submitted under these Procedures and Guidelines is mandated in Condition 24 of the PESL and Condition 23 in the APESL and relates to the reporting obligations of the individual licensee as follows:

- The Licensee shall submit its audited financial statements, with certificate of the external auditors, for the Licensed Business and the accompanying annual report (which shall provide together with the current year at least ten years of operating and financial statistics) to URCA as required by URCA having regard to the Licensee's requirements for its annual report and audited financial statements.
- URCA may require the Licensee to maintain separate Regulatory Accounts for regulatory reporting and tariff analysis.
- The Licensee shall furnish to URCA without undue delay such information, documents and details related to the Licensed Business, as URCA may reasonably require in order for it to fulfil its functions and discharge its obligations under the Act.
- The Licensee shall furnish to URCA without undue delay such information, documents and details related to the Licensed Business that have or is likely to have a significant impact its functions assigned to it by or under the Licence and the Act.
- The Licensee shall provide a Major Outage report to URCA within 24 hours of a major outage detailing, to the extent possible, the: (i) cause of outage; (ii) geographic area affected by the outage; (iii) number of customers affected by the outage; (iv) steps taken to restore service to the affected area; and (v) time taken for restoration of service.
- The Licensee shall provide such other specified and relevant reports to URCA as may be reasonably required from time to time.
- The Licensee shall annually prepare and submit to URCA a five-year forecast of projected demand and generation requirements.
- The Licensee shall, annually, provide URCA with its capital investment plan and updated five-year capital investment plan.
- The Licensee shall, in accordance with good industry practice, maintain and keep all appropriate books, records and accounts in respect of the activities to which this Licence relates including but is not limited to System Average Interruption Duration (SAIDI), the System Average Interruption Frequency Index (SAIFI) and Customer Average Interruption Duration Index (CAIDI) and such other internationally accepted utility industry performance indicators as URCA may direct.

Each specified licensee must submit information and data relating to its individual performance to URCA in the manner and form (including by the date and dates) as proposed by these Procedures and Guidelines.

Failure to submit information and data referred to in section 74 of the EA in the manner and form determined by URCA Performance Procedures and Guidelines is a breach of the EA, and may constitute an offence[1].

URCA has listed the information and data that licensees are required to submit to URCA under these Reporting Requirements Procedures and Guidelines in the following Annexes:

(a) Annex 1 – Pro-forma – Quarterly and Half-yearly and yearly reporting;
(b) Annex 2 – Proposed KPIs reporting format and Reporting Requirements for a PES;
(c) Annex 3 – Glossary
(d) Annex 4 – Reporting Templates

All specified licensees shall submit information and data to URCA even if a nil figure is recorded in relation to data proposed to be submitted in accordance with these Procedures and Guidelines.

URCA may use any information or data provided to it under section 74 of the EA for the preparation of electricity market performance reports, or publish documents and reports in accordance to section 43 of the EA, and in accordance with the provisions of the licensee's specific licence.

1.2 FREQUENCY OF REPORTING - DATES BY WHICH DATA AND INFORMATION MUST BE SUBMITTED

1.2.1 QUARTER 1, 2 AND 3 REPORTS

Quarter 1, 2 and 3 reports on the performance indicators must be submitted to URCA by the following dates:

The report for the period 1 January to 31 March (the Q.1 report) must be submitted to URCA no later than 30 April in each year;

The report for the period 1 April to 30 June (the Q.2 report) must be submitted to URCA no later than 31 July in each year;

The report for the period 1 July to 30 September (the Q.3 report) must be submitted to URCA no later than 31 October in each year.

1.2.2 QUARTER 4 AND ANNUAL REPORTS

The Quarter 4 and Annual report on all performance indicators for the relevant financial year must be submitted by 31 January in each year. The report must contain all information and data required for quarterly indicators for the period 1 October to 31 December, as well as the information and data required for the annual indicators.

1.3 MANNER AND FORM IN WHICH INFORMATION AND DATA MUST BE SUBMITTED

Reports by a regulated entity under sections 1.2.1, and 1.2.2 must be:

(a) prepared using the pro-forma in Annex 1;

[1] Section 74 (3)(a)(b) of the Electricity Act, 2015

(b) accompanied by a completed URCA Performance Reporting Template (see –Microsoft Excel Template); and

(c) submitted electronically. Where a signed report has been submitted electronically it is not necessary to submit an additional copy by post.

URCA is believes that Information and data must be provided on a quarterly, semi-annually and/or annual basis as specified in the KPI matrix in Annex 2.

Unless otherwise specified in the URCA Performance Reporting matrix, data must be reported on a per licence basis.

To ensure robust interpretation of this data, URCA advises and encourages specified licensees to provide accompanying commentary. The URCA Performance Reporting Template (see –Microsoft Excel) allows regulated entities to provide commentary within the template by adding a comment box. URCA believes that regulated entities should provide commentary where they consider it appropriate to highlight and explain key factors relevant to the level of, and trends in, their performance. The URCA may also seek further information from regulated entities to assist in understanding and interpreting any information and data provided.

Quarter 1, 2, 3, and 4 reports on quarterly and annual performance indicators under section 1.2.1, and 1.2.2 must be signed by the Chief Executive Officer (CEO) of the regulated entity or a delegate appointed by the CEO for this purpose.

1.4 PROCESS FOR SUBMISSION OF REPORTS

URCA is proposing that reports must be submitted by email to the Utility Regulation & Competition Authority at info@urcabahamas.bs, with subject heading Performance Report [Q.1/2/3/4] or as advised in writing by URCA.

1.5 PUBLICATION OF LICENSEES OPERATIONAL REPORTING INFORMATION/DATA

KPIs are useful tools in tracking performance over time because they provide a concise account of pertinent data in a format that is easy to absorb and remember. However, care should be taken when interpreting ratios to ensure that the message derived is consistent with impact of the contributing data. Ratios are useful for providing snapshots and/or headlines and hence are more easily digestible for Government and the public; however, to enhance deeper regulatory insights and decisions, they should be accompanied by analysis and reporting to explain what is driving them. URCA should be in a position to understand the implications behind those changes by having access to higher levels of data and explanation of the reported figures. It is URCA's remit to ensure that reporting to Government and other stakeholders is balanced by giving appropriate explanations of the significance of each ratio, and providing explanations for any discernible trends.

1.6 CONCLUSION AND NEXT STEP

The anticipated outcomes from establishing a performance monitoring and reporting regime are as follows:

- to **Inform** consumers about the level of service they receive and identify the reasons for performance;
- to **Identify** baseline performance of individual index and provide appropriate incentives for improvement overtime;
- to **Provide** information and data for developing regulatory standards and targets where required and for on-going assessment of compliance with such standard;

- to **Compare** electricity providers by gauging relative performance within the industry as well as with other utilities performing comparable operations in other industries; and
- to **Inform** the decision making process of URCA, Licensees and the Government.

ANNEX I: PRO-FORMA – MONTHLY,QUARTERLY AND HALF-YEARLY AND YEARLY REPORTING

To be submitted on company letterhead [Date]

From: [Name]

[Position title]
[Regulated entity]

To: Chief Executive Officer
Utilities Regulation and Competition Authority (URCA)
Info@urcabahamas.bs

URCA Compliance Procedures and Guidelines - Reporting Obligations

This report documents the reporting requirements of URCA's reporting obligations under the URCA Reporting Obligations Procedures and Guidelines (Reportable Obligations) during the following reporting period(s).

[Check the following box to specify the current reporting period or periods]

Q1 [1 Jan – 31 Mar]	[Due 30 Apr]	Q3 [1 Jul – 30 Sep]	[Due 31 Oct]
Q2 [1 Apr – 30 Jun]	[Due 31 July]	Q4 [1 Oct – 31 Dec]	[Due 31 Jan]
H1 [1 Jan – 30 Jun]	[Due 31 Jul]	A1 [1 Jan – 31 Dec]	[Due31 Jan]

This report has been prepared with all due care and skill and in accordance with URCA's Compliance Procedures and Guidelines. Throughout the period covered by this report the regulated entity had effective policies, systems and procedures in place to monitor compliance with procedures and guidelines, established and observed in accordance with the URCA Reporting Obligations Procedures and Guidelines.

Signature Print name [CEO / MD or acting CEO / MD]

Failure to comply with the URCA Reporting Requirements Procedures and Guidelines is a breach of the Licence condition and may attract regulatory fines and penalties. If a licensee contravenes this obligation to comply, the licensee is liable to a regulatory fine or other penalty determined by URCA, and not exceeding ten percent of the licensee's relevant turnover.

ANNEX II: KPI DATA REPORTING REQUIREMENTS FOR PES

Reporting Indicator	Unit	Broad Definition and data required	Reporting Frequency	Licensee Comments	URCA's Response
Proposed Technical Data					
Capacity Factor	% Ratio	Capacity Factor is a ratio of actual generation of power to maximum capacity to generate. This indicator measures percentage of installed capacity that is utilized. Capacity Factor provides information on how close the power supply system is to being overloaded or, in other words, is being operated relative to its limit defined by the level of installed capacity. Capacity Factor is calculated as ratio of average hourly generation to maximum possible generation at the installed capacity level (before losses). It is usually expressed in percentage terms. ***Capacity Factor = (Net electricity generated (MWh) / (24hours*number of days in reporting period)) / Installed capacity (MW)***	Quarterly		
Availability	% Ratio	Availability (Operating Ratio) is the ratio of operating to installed capacity. It measures actual capacity of the power system as compared with nominal capacity and usually is expressed in percentage terms. The formula for calculating operating ratio is: ***Operating Ratio = Operating capacity (MW) / Installed capacity (MW)***	Quarterly	This is a point measurement and may not represent the period	The latest point measurement will suffice
Cost of Electricity Generation	$/MWh	Measures the cost of producing 1 MWh of electricity. Should include the cost of power generated internally and procured externally by the utility. The total cost is divided by the total number of energy units sold.	Annual		
Generation	ratio	Measures to what extent installed capacity meets demand. Demand equals actual demand plus demand from connected customers who cannot be served[12].	Quarterly		

[11] For BPL, where applicable a separate set of KPIs is required for each island or distinct network

[12] URCA believes that it is prudent on the part of relevant licensees to calculate this ratio as it provides valuable information and data to inform the decision making process of all stakeholders.

Reporting Indicator	Unit	Broad Definition and data required	Reporting Frequency	Licensee Comments	URCA's Response
Capacity/Demand					
Heat Rate	KiloJoules per Kilowatt hours (kJ/kWh)	Heat rate is the common measure of the technical efficiency of a thermal power plant or generating unit. It is defined as the amount of fuel energy input used by a generating unit or power plant to generate one kWh of electricity. This is mathematically represented as Equation Heat Rate (kJ/kWh) = Energy Input to the system (BTU/hr) × (1.055 kJ/BTU) ÷ Power Output (kW)	Quarterly		
Customers per km	customers/ km	Measures electrification density of the utility. When both transmission and distribution length are included in the denominator, the measure is less clear, as it is affected by the "profile" of the utility of being transmission or distributionoriented. Therefore, it is best to have separate measures for transmission and distribution.	Annual	BPL does not have this measure available and will not be able toreport on it	URCA will withdraw this KPI on BPL request until 2022 when URCA believes that this will give BPL sufficient time to have this measure done

Reporting Indicator	Unit	Broad Definition and data required	Reporting Frequency	Licensee Comments	URCA's Response
System Losses	% of supply	This indicator is the most significant for measuring all losses that occur during the transmission and distribution of electricity from generation stations to end-use customers. Total system losses equal (Electricity supplied to grid (MWh) – Total electricity billed (MWh))/ Electricity supplied to grid (MWh). Reflects utility's effort in measuring theft/illegal connections, possibly augmented with overloaded system parts. Total losses combine technical and "non-technical" losses.	Annual		
Load Factor	Ratio	***Load factor = (Annual electricity supplied (MWh)/ (24hours*365days)) / Peak annual demand (MW)*** Load factor is a ratio of average annual load to maximum annual load. This indicator measures how much power is supplied on the average per unit of peak demand. Load factor provides information on how efficiently the power system equipment is used and, to a certain extent, helps understand how close the power supply system is to being overloaded.	Annual		
Major Outage Report	#/24 "working" hours As per Licence Condition 24	The Licensee shall provide a Major Outage report to URCA within 24 hours of a major outage detailing, to the extent possible, the: (i) cause of outage; (ii) geographic area affected by the outage; (iii) number of customers affected by the outage; (iv) steps taken to restore service to the affected area; and (v) time taken for restoration of service.	Major Outage report within 24 hours	The report should be reduced to these as required rather than the additional requests that have been levied	All outages impact the quality of service to the consumers and URCA is required to monitor all type of outages.

Reporting Indicator	Unit	Broad Definition and data required	Reporting Frequency	Licensee Comments	URCA's Response
Number of Outages per Year	#/Yr	Measures quality of power supply. Consumer dissatisfaction with service is often related to high level of outages. Outages can be caused by generation or network failures.	Annual	This needs to be defined. Is this the number of outage events or the number of feeder trips?	It is a measure of the number of outage events
Number of Transformer Failures per Year	#/Yr	Reflects one of the most common reasons for outages and high O&M costs.	Annual	Transformer failures are not one of the most Common reasons for outages and while data is collected for another purpose, it is not readily available in a reportable format. BPL will not be able to provide this information	URCA is of the view that there is no complexity and measuring the number of transformer failures and to report on a simple count each year. URCA therefore rejects BPL's assertion that it will not be able to provide this information
5-year forecast of projected Demand and Generation requirements		The Licensee shall annually prepare and submit to URCA a five-year forecast of projected demand and generation requirements.	Annual		

Proposed Quality of Service data requirements

Reporting Indicator	Unit	Broad definition and Data required	Reporting Frequency	Licensee Comments	URCA's Response
SAIDI	Hours/year	Number of hours consumer on the system was without power in a year, divided by the total number of customers. The equivalent is SAIDI, System Average Interuption Duration Index calculated by dividing the sum of all customer interruption durations, in minutes, by the total number of customers served	Annual		The Licensee shall annually prepare and submit to URCA a five-year forecast of projected demand and generation requirements.
SAIFI	Interuptions/year	The Licensee shall annually prepare and submit to URCA a five-year forecast of projected demand and generation requirements.	Annual		The Licensee shall annually prepare and submit to URCA a five-year forecast of projected demand and generation requirements.

Proposed Commercial data requirements

Reporting Indicator	Unit	Broad Definition and data required	Reporting Frequency	Licensee Comments/Proposal	URCA's Response
Commercial Indices					
Tariff Settings and Adjustments	Times/ year	Measures utility's ability to revise tariffs and adjust tariff schemes in order to cover costs with revenues. For many utilities, tariff decisions are made politically and not on the cost basis. Often utilities are not compensated for resulting losses.	Annual	URCA is aware that Tariff Settings are rare and driven by a political approval process. What is URCA's reason for this information?	URCA is mindful of the maturity of the regulatory regime and the yet to define tariff regime to be applied to BPL and has therefore agree to omit this reporting Indicator
Profit/Loss	BSD	Indicates to what extent the utility can have cost reflecting tariffs and keep control of investments, costs and bill payment.	Annual	Again, BPL is not in business for profit but should be raising money for capital investment. The ability to set tariffs is exogenous	URCA notes BPL comment
Bad Debts	BSD	This KPI gives an indication of receivables, which have been written off. The indicator is therefore crucial in the company's management of outstanding accounts. It therefore measures the commercial effectiveness of the utility company	Annual	This may be affected by a number of factors. While BPL has provisioning for Bad Debt, arrears are never truly written-off. The criticality of reporting	URCA notes BPL's comments and maintained that this reporting indicator in the public interest and is a KPI to be monitored

Reporting Indicator	Unit	Broad Definition and data required	Reporting Frequency	Licensee Comments/Proposal	URCA's Response
				on this measure is questionable to BPL	
Customer Bill Collection Rate	%	Revenues collected total electricity billed. Shows effectiveness of the utility in bill collection.	Quarterly		
Total O&M Cost/Revenue		Operation and maintenance cost as a percentage of utility total revenue. Too low O&M cost may result in a need in very high investment and O&M cost in the future. Too high O&M cost indicate generic problems for the utility.	Annual	The Licensee shall annually prepare and submit to URCA a five-year forecast of projected demand and generation requirements.	URCA accept BPL proposal
Bad Debt on Collections (% of billed)		The ratio of the debt written off by the Financial Department to the total amount of money billed to customers for the sale of electricity.	Annual	As above/before; Exogenous factors apply	URCA accept BPL proposal

Proposed Financial data Requirements

Reporting Indicator	Unit	Broad Definition and data required	Reporting Frequency	Licensee Comments	URCA's Response
Operating Expenses Covered by Revenues	%	The indicator of operating expenses covered by revenues is a ratio of operating costs to revenues billed, expressed as percentage. As opposed to Days of accounts receivable, it does not take into account utility collection efficiency, but rather reflects whether the utility is capable of recovering its current expenditures at the existing consumption level and tariffs. **Operating Expenses Covered by Revenue = (Utility Operating Cost/Billed Revenue) * 100%**	Annual	How is this (i.e. the information gleaned) different from the Cost Recovery Ratio?	This is in effective a measure of Cost Recovery Ratio?
Accounts Receivables	Days	Accounts receivable is cash that customers owe to the utility for power supplied to them. The indicator of days of accounts receivable shows how fast the utility collects payments from customers. The lower this indicator, the more financially efficient the utility is. This indicator is calculated as: ***Accounts Receivable (Days) = Year-end Accounts Receivable/ (Annual Operating Revenues/365 Days)***	Annual		
Audited Financial Statements	As Per Licence	The Licensee shall submit its audited financial statements, with certificate of the external auditors, for the Licensed Business and the accompanying annual report (which shall provide together with the current year at least ten years of operating and financial statistics) to URCA as required by URCA having regard to the Licensee's requirements for its annual report and audited financial statements.	Annual		
CAPEX	As per Licence	The Licensee shall, annually, provide URCA with its capital investment plan and updated five-year capital investment plan.	Annual		
Average Industrial Tariff	($/kWh)	Average price per kWh of electricity sold to industrial consumers, including both fixed ($/kVA) and variable components ($/kWh), in local nominal currency	Quarterly		

Reporting Indicator	Unit	Broad Definition and data required	Reporting Frequency	Licensee Comments	URCA's Response
Average Residential Tariff	($/kWh)	Average price per kWh of electricity sold to residential consumers, including both fixed and variable components, in local nominal currency.	Quarterly		

Fuel Data Requirement

Reporting Indicator	Unit	**Broad Definition and data required**	**Reporting Frequency**	**Licensee Comments**	URCA's Response
Fuel KPI					
Fuel Charge by type of fuel (e.g. HFO, Diesel, Other fuel) - Heavy Fuel Oil (HFO) contribution to Fuel Charge - Automotive Fuel Oil (ADO) contribution to Fuel Charge - Other Fuel contribution to Fuel Charge	$/kWh	Total Cost of Fuel Purchase ($) divided by the gross generation minus station use (kWh) Provide a monthly matrix of data with appropriate units of measurements on types of fuel consumed by station, volume, costs and electricity generated from type of fuels. • Cost of Heavy Fuel Oil (HFO), • Cost of Automotive Diesel Oil (ADO) • Cost of other fuels • Electricity generated from HFO, ADO and other Fuels Volumes of HFO, ADO and other fuels purchased and refined	Quarterly		

Proposed Efficiency and Social data requirements

Reporting Indicator	Unit	Broad Definition and Data Required	Reporting Frequency	Licencees Comments	URCA's Response
Efficiency KPIs					
Operating cost per employee	BSD/employee	Total Operating Cost* x 100% Total Number of employees at end of period *(Excl. power purchases, depreciation & Interest Payment)	Quarterly	Provision of this information is dependent on receiving the total operating cost for the quarter by the reporting deadline. This was the reason for the 45 day request	URCA notes BPL request and is of the view that 30 calendar days is sufficient time to cross checked and validate data. Moreover it is expected that BPL would want to have this data set available the earliest so as to informed management decision in a timely manner.
Customer/Employee	Ratio	Measures labor efficiency of utility. The ratio tends to be higher in well managed, efficient utilities. Total Number of customers at end of period *divided by* Total Number of employees at end of period	Bi-annual		
Staff cost/Total operating cost	Ratio	Measures the weight of staff costs in the cost structure of the utility. Staff costs are a major factor of utility profitability.	Annual	BPL requested the the formula for this KPI	This is the total cost relating to staff salaries and benefits divided by the total operating costs

Reporting Indicator	Unit	Broad Definition and Data Required	Reporting Frequency	Licencees Comments	URCA's Response
Social Impact KPIs					
Number of households electrified annually	%	Number of new domestic connections at end of year x 100% Total number of domestic connections for entire system	Annual		
Number of applications for new connections	Number Index	Total number of applications: Domestic and non-domestic	Annual		
Number of Applications approved	Number	Total number of applications approved: Domestic and non- domestic defined by: Acceptance Index = Number of Applications Approved Number of Applications Submitted	Annual		

ANNEX III: DEFINITION, FOR PERFORMANCE MONITORING INDICATORS[2]

This section outlines URCA's:-

- Definition of each indicator with formula and sufficient details for users and Licensees to know unequivocally what data are to be included in the indicator.
- Analysis of the importance of the KPI in measuring utility performance and operations.
- Recommendations of methods and strategies to improve licensees' performance in some indicators.

Indicator Total System Losses

Full Name:	Total system losses
Short Name:	System losses
Formula:	(Electricity supplied to national grid - Total electricity billed) x 100/Electricity supplied to national grid
Units:	%
Key Importance to KPI:	Operationalizes overall distribution performance of utility (including technical and non-technical aspects).
Customer service contribution:	Availability, reliability, cost, customer relations.

Definition and analysis

Total system losses is a popular indicator for measuring all losses that occur during the transmission and distribution of electricity from generating stations or points of purchase to end-use customers. Total system losses equal the difference between the power (MWh) supplied for consumption within the country and the power (MWh) billed to end users.

System losses = (In-country generation, net of plant own use (MWh) – Export (MWh) + Import (MWh)) – Electricity billed to customers) / (In-country generation, net of plant own use (MWh) – Export (MWh) + Import (MWh))

The main components of system losses are technical losses (e.g. heat or copper losses, magnetic losses, or transformation losses) and non-technical losses (e.g. meter failure, meter tampering or fraud, un-metered or illegal connections, or data encryption losses in billing, in other words, commercial losses, metering failures and theft). It provides more reliable and thus better comparable performance information than Technical and Nontechnical losses, which are very difficult to separate. Total system losses, as referred here, do not include collection losses that occur due to customer unwillingness or inability to pay, failures in billing and collecting.

[2] Monitoring Performance of Electric Utilities, Indicators and Benchmarking in Sub-Saharan Africa by: Prasad Tallapragada V.S.N., Maria Shkaratan, Ada Karina Izaguirre, Jaakko Helleranta, Saifur Rahman

For a vertically integrated utility total system losses equal combined Transmission and Distribution (T&D) losses. However, the indicator can be broken into two parts: System losses of electricity transmission and System losses of electricity distribution. Each of them will comprise technical and non-technical losses.

System losses are most often indicated as a percentage of total electricity supplied to the network, even though it can also be indicated in terms of an amount of energy (MWh).

System losses is one of the most essential power sector indicators, especially for developing countries, as it provides information about power system efficiency and overall performance of a power utility in terms of energy that it procures, sells and bills to customers.

Monitoring total system losses closely is crucial because of the multiple financial and commercial areas of performance it captures. Reducing system losses often provides one of the fastest ways to improve a utility's financial performance. Regulators, governments and public interest groups are also interested in monitoring this indicator, as it has important implications for tariff calculations and required fiscal support to electricity companies.

Limitations of the indicator

System losses provide a good overview of a utility's performance but the indicator is limited to be used on the system level: while providing an overall estimate of sector efficiency, the indicator of system losses does not help understand the sources of inefficiency. This happens due to the fact that system losses combine technical and all types of non-technical losses. Therefore, while estimating the overall level of inefficiency, it does not define where the problems are – in the condition of the equipment, in sector management or in theft. Other loss measures are needed to better understand the sources of losses.

Operational dimensions of the indicator

Technical efficiency: The system loss indicator is a direct measure of the technical efficiency of a utility. Although not perfect, this indicator provides more reliable information on technical efficiency than other measures of losses (e.g. technical and non-technical) because the input data of the indicator is more verifiable than those of other indicators.

Commercial efficiency: This dimension has two components: (a) non-technical losses due to billing and metering errors, theft of electricity among other causes and (b) collection efficiency that compares revenues collected against the bills issued. Given that the system losses indicator only addresses the first component of the commercial efficiency, this indicator cannot be used to assess the commercial efficiency of a utility.

Capacity Factor

Capacity factor is a ratio of actual generation of power to maximum capacity to generate. This indicator measures percentage of installed capacity that is utilized. Capacity factor provides information on how close the power supply system is to being overloaded or, in other words, to its limit defined by the level of installed capacity. When capacity factor is high (i.e., actual supply is approaching its capacity limit), there is a risk of system overload and power blackout. At the same time, high capacity factor reflects that power equipment usage is efficient. Low capacity factor indicates inefficiency in equipment usage. Capacity factor is calculated as ratio of average hourly generation to maximum possible generation at the installed capacity level (before losses). It is usually expressed in percentage terms.

Capacity factor = (Net electricity generated (MWh) / (24hours × # of day in month)) ÷ Installed capacity (MW)

Load Factor

Load factor is a ratio of average annual load to maximum annual load. This indicator measures how much power is supplied on the average per unit of peak demand. Load factor provides information on how efficiently the power system equipment is used and, to a certain extent, helps understand how close the power supply system is to being overloaded. When load factor is high (i.e., average supply is only marginally below peak demand), equipment usage efficiency is high and vice versa. At the same time, when load factor is close to 100%, the system might be at its capacity limit and could collapse with potential increase in peak demand. Load factor is calculated as ratio of average hourly supply (before losses) to peak annual demand of power. It is usually expressed in percentage terms.

Load factor = (Annual electricity supplied (MWh) / (24hours*365days)) / Peak annual demand (MW)

Availability (**Operating Ratio)**

Operating ratio is the ratio of operating to installed capacity. It measures actual capacity of the power system as compared with nominal capacity and usually is expressed in percentage terms. The formula for calculating operating ratio is:

Availability (Operating ratio) = Operating capacity (MW) / Installed capacity (MW)

Operating ratio provides information about the condition of the power sector assets. This information is important by itself, as it reflects the burden of unutilized assets for both the power sector and the fiscal system. In addition, it provides context to the analysis of other efficiency indicators, such as load factor and capacity factor.

This indicator is quite important for The Bahamas, where quantity and quality of power supply are major problems, both of which are directly related to the poor condition of the sector assets. It also points to cases, in which nonoperational assets might create serious fiscal problems.

BPL Response: This information is dated and may no longer apply.

There is a relationship among the three indicators described here – load factor, capacity factor and operating ratio. Operating ratio can be used to check if the low level of capacity factor can be explained by condition of the power system physical assets or by other reasons, most likely managerial inefficiency or theft. When both capacity factor and operating ratio are low, at least one of the explanations for low capacity factor is condition of the assets. When capacity factor is low while operating ratio is high, the low capacity ratio cannot be explained by physical asset condition and other reasons should be assumed.

Accounts Receivable

Accounts receivable is cash that customers owe to the utility for power supplied to them. The indicator of days of accounts receivable shows how fast the utility collects payments from customers. The lower this indicator, the more financially efficient the utility is. This indicator is calculated as:

Accounts Receivable (Days) = 365 Days / (Annual Operating Revenues/Year-end Accounts Receivable)[2] Another way to present the same formula is:

Accounts Receivable (Days) = Year-end Accounts Receivable / (Annual Operating Revenues/365 Days)[3]

In either case, the outcome of the calculations gives the number of days it will take to collect outstanding accounts receivable considering a past year's experience with the average time gap between the day the service was

provided and the day the payment was received.

Cost Recovery Ratio

Cost recovery ratio can be measured[3] as ratio of effective tariff[4] to cost per kWh, expressed as percentage. It makes sense to use two such ratios: operational and total, the former based on operational cost and the latter on total cost, which has both operational and capital components. Together with the indicator of operating expenses covered by revenues, cost recovery ratio reflects utility ability to cover its expenditures with revenues. However, they differ: ratio of operating expenses to revenues takes into account actual consumption level, while cost recovery ratio ignores current consumption level and can be calculated for any theoretical level of consumption.

Operating Expenses Covered by Revenues

The indicator of operating expenses covered by revenues is a ratio of operating costs to revenues billed, expressed as percentage. As opposed to Days of accounts receivable, it does not take into account utility collection efficiency, but rather reflects whether the utility is capable of recovering its current expenditures at the existing consumption level and tariffs. This indicator is below 100% if operational cost is covered by revenues. To be able to recover costs that include capital expenses (in addition to operating expenses) and to account for non-collection, this indicator should be noticeably below 100%.

It is important to mention that some of the factors of performance according to this indicator are outside of utility decision making power. This includes tariffs and certain elements of operating costs. Also, operating cost largely depends on source of generation and, with thermal generation, on oil prices. These examples show that the word "performance" used in the paragraph above does not necessarily mean "utility efficiency". However, many components of the costs and collection level can certainly be optimized by utilities – therefore, the indicator of operating expenses covered by revenues can be improved with increased utility efficiency.

Heat Rate

Heat rate is the common measure of the technical efficiency of a thermal power plant or generating unit. It is defined as the amount of fuel energy input used by a generating unit or power plant to generate one kWh of electricity. This is mathematically represented as Equation 9.2.

$$\text{Heat Rate (kJ/kWh)} = \text{Energy Input to the system (BTU/hr)} \times (1.055\ \text{kJ/BTU}) \div \text{Power Output (kW)}$$

Heat rate represents the technical efficiency of generating plant in converting fuel into electricity. A lower heat rate means that less fuel is used per kWh of electricity and this corresponds to greater efficiency and to reduced fuel expenses. Heat rates are not the same for all generating plants. Generating units used for peaking purposes, such as gas turbines, generally have higher heat rates than baseload units, which are more efficient. The existence of these differences in heat rates underscores the importance of the generation supply mix.

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[2] The denominator of the equation is called turnover ratio=net sales / end-year receivables. Turnover ratio shows how many times the company turned over its receivables in a year. It is preferable to use average of end-year receivables for the current year and the previous year.

[3] The denominator of the equation shows average daily revenue. Dividing accounts receivable by average daily revenue gives number of days daily average is called turnover ratio=net sales / end-year receivables. It is preferable to use average of end-year receivables for two years: the current one and the previous one.

[3] Cost recovery can be measured in a different way, for example, as ratio of unit revenue to cost. In this case it would reflect the price-cost-revenue collection relationship, while the proposed in this section tariff-to-cost ratio reflects the price-cost relationship, separated from the collection rate.

[4] Effective tariffs measure electricity price per kWh at different monthly consumption levels. The formula for effective tariff calculation is: t=a*x+b, where: a is volume-based charge per kWh, x is volume consumed, and b is fixed charge.

System Heat Rate

The average System heat rate is dependent on the average heat rate and Net Energy Output (NEO) of each generating unit dispatched.

Principles for Establishing the System Heat Rate Target

URCA is of the view that the heat rate target for the PES generation systems is a prudent and appropriate measure which can be adopted to permit the efficient pass-through of fuel costs incurred by PES to its customers. The target will prove useful for the PES to be mindful of the efficiency use of fuel in the generation of electricity to its customers. On establishing a baseline system heat rate fit for purpose for the specific PES URCA may review the system heat rate periodically to ensure that PES generating units are utilizing the fuel most efficiently so electricity ratepayers are provided with fair and reasonable fuel rates. The periodic review by URCA will also aimed at providing the PES with an incentive to improve the fuel conversion efficiency of their thermal generating system and share the resultant cost savings with their customers.

The periodic heat rate review further seeks to ensure that PES operates the system to minimize the total cost of electricity generation by adhering to the economic dispatch of all available generating units subject to system constraints as required by the Licence and the Generation Code.

ANNEX IV: GLOSSARY OF INDICATORS KEY TERMS

Power system indicators and terms

Installed capacity, Conventional thermal (MW)

The combined installed capacity of all conventional thermal generation units (oil, gas, coal). See "Installed capacity, Total (MW)" for definition of installed capacity.

Installed capacity, Gas-fired (MW)

Total installed capacity of all gas-fired generation units.
See "Installed capacity, Total (MW)" for definition of installed capacity.

Installed capacity, Other renewables (MW)

Total installed capacity of all non-hydro renewable generation units.
See "Installed capacity, Total (MW)" for definition of installed capacity.

Installed capacity, Total (MW)

The maximum rated output of a generator, prime mover, or other electric power production equipment under specific conditions designated by the manufacturer. Installed generator nameplate capacity is commonly expressed in megawatts (MW) and is usually indicated on a nameplate physically attached to the generator. The series include installed IPP generation capacity but excludes captive generation and self –generation capacities

Operational indicators and terms

Capacity factor, Annual (%)

Electricity generation, Net (MWh) divided by Installed Capacity (MW) times 8760 hours, expressed as a percentage. The ratio of a power plant's actual generation to its maximum potential generation over a certain time period. The "maximum potential" generation is determined by assuming continuous output at the power plant's rated capacity. For example, a 10 MW plant operating for 10 hours would have maximum potential generation of 100 MWh; if it instead generated 50 MWh, it would have a capacity factor of 50 percent. NOTE: Available operating capacity may be significantly lower than installed capacity.

Operating capacity, Total (MW)

The average amount of generation capacity in functional condition, available for production. Operating generation capacity includes capacity under planned maintenance. The IEA defines operating capacity as "the sum of all individual plants' maximum capacities available during a period of at least 15 hours per day."

Connections per employee (number)

The number of connections divided by the number of full time equivalent employees.

Demand, Annual on-grid (MWh)

Total load served in the interconnected network(s) during the year in question. It is calculated as: "Electricity generation, net" plus "Electricity imported" and thus includes system losses.

Electricity purchased from IPPs (MWh)

Total amount of electricity purchased by the national generation and distribution companies from independent power producers (IPPs).

Electricity purchased, Total (MWh)
Total amount of electricity purchased by the national generation and distribution companies from independent power producers (IPPs) and foreign countries (net of exports).

Electricity sold, High voltage industrial (MWh)
Volume of electricity sales billed to high voltage (HV) industrial customers. See "Electricity sold, Total (MWh)" for details.

Electricity sold, Medium voltage commercial (MWh)
Volume of electricity sales billed to medium voltage (MV) commercial customers. See "Electricity sold, Total (MWh)" for details.

Electricity sold, Residential and low voltage business (MWh)
Volume of electricity sales billed to residential and low-voltage (LV) commercial customers. See "Electricity sold, Total (MWh)" for details.

Electricity sold, Total (MWh)
The total volume (MWh) of electricity billed to national customers.
NOTE: Might differ from power consumption, as the latter could be calculated to include non-technical losses.

Employees, Total full time equivalent (number)
The number of full time equivalent employees is calculated as number of hours worked by full-time and part time employees divided by the number of hours in a full working day. Thus, employees working half time are to be counted as half an employee and so on.

Load factor, Annual (%)
Electricity generation, Net (MWh) divided by Peak demand (MW) times 8760 hours, expressed as a percentage. The load factor gives an idea of how the operating capacity of the generation companies is used.

Losses, Distribution (%)
Electricity delivered for national distribution minus Electricity billed (expressed as percentage). Thus, it is energy lost in distribution as percentage of energy delivered for distribution.

Losses, Non-technical (%)
Consist mainly of unmetered and unbilled consumption, including consumption through illegal connections and incorrect estimation of legal consumption due to tampering with meters and inadequate fixed billing (expressed as percentage of Net Generation).
NOTE: Non-technical losses can also be referred to as commercial losses.
NOTE: Non-technical losses are difficult to measure separately from technical losses.

Losses, Technical (%)
Technical losses consist of resistance and iron core losses, which occur during the transmission and distribution process.
NOTE: Technical losses are difficult to measure separately from non-technical losses.

Losses, Total system (%)
Total load served (MWh) minus Electricity billed (MWh) divided by Total load served (MWh) (expressed as percentage). Total system losses is total amount of energy lost during transmission and distribution of electricity. System losses can be divided into technical and non-technical losses, the latter including theft, commercial and metering losses. They do not account for non-payment by end users. For technical losses, see "Losses, Technical (%)".

Losses, Transmission (%)
Total load served minus Electricity delivered for distribution divided by Total load served (expressed as percentage). Thus, it is energy lost in transmission as percentage of energy transmitted.

Operating meters rate, Residential and low voltage business (%)
Percentage of residential or low-voltage customers that have an operating meter. In practice, this may be approximated by percentage of customers who are billed based on metering (including prepayment metering) as opposed to consumption estimation.

Operating-to-installed capacity ratio (%)
Operating capacity divided by installed capacity, expressing as a percentage. Indicates the extent to which plant installed capacity is maintained for operation.

Peak load, Annual, On-grid (MW)
The maximum load of the interconnected system(s) during the year question. In case a country has multiple interconnected systems it is the sum of peak demands of each of these systems.

Reserve margin (%)
Installed capacity less peak load, as a percentage of peak load.

Sales per employee (MWh/employee)
Total electricity sold divided by the full-time equivalent number of employees.

Financial indicators and terms

Accounts receivable (days)
Average number of days the utility takes to collect outstanding accounts receivable considering a past year's experience with the average number of days between service provision and payment receipt. Calculated as: [365 Days / (Annual Operating Revenues/Year-end Accounts Receivable].

Average annual revenue per residential or low voltage customer (BSD)
"Revenues from electricity billed" divided by "Customers, Residential or low voltage business (thousands)".

Average connection charge, Residential customers (BSD)
The average connection charge is calculated by dividing total connection charges by the number of new customers. The difference between number of customers in a given year and the year before can be used as the number of new customers if the actual number of new connections is not available.

Average electricity tariff, All customers (BSD/kWh)
Total revenue from electricity billed divided by electricity billed (kWh).

Average electricity tariff, Residential customers and low voltage business (BSD/kWh)
Revenue from residential customers divided by electricity billed to residential customers (kWh).

Average operating expenses per kWh (BSD/kWh) Operating expenses divided by Total load served.

Capital expenditure, Total (BSD, millions)
Capital expenditure includes all investments made by the company in plant property, equipment, and other infrastructure.

Collection ratio (%)
Revenue as percentage of billings. Calculated as: [Accounts receivables (year opening) + Revenue - Accounts receivables (year closing)]/Billings.

Current ratio (number)
Total current assets divided by total current liabilities.

Debt-equity ratio (number)
Total liabilities divided by total equity.

Debt-service coverage ratio (number)
Cash income divided by debt service liability.

Effective residential tariff at 100 kWh/month consumption level
Price paid for 1 kWh if 100 kWh is consumed per month. The indicator is calculated using tariff schedules and includes fixed and volume-based electricity charges.

Gross fixed assets, Book value (BSD, millions)
Total value of fixed assets as reflected in the balance sheet at the end of the year, excluding depreciation.

Labor costs, Total (BSD, millions)
Wages, expenses, and benefits of employees.

Operating expenses covered by revenues (%)
Operating expenses divided by revenues billed, expressed as percentage.

Operating expenses, Total (BSD, millions)
Comprises all recurrent costs plus depreciation plus financial costs (such as debt service and interest charges, foreign exchange losses), before taxes.

Operating ratio (%)
Operating expenses as percentage of total revenue.

Return on assets (%)
Annual earnings divided by total assets, expressed as percentage.

Return on equity (%)
Net income divided by total equity, expressed

Revenue per employee (BSD/employee)
Total revenues divided by number of full-time equivalent employees.

Revenue, Annual, Average (BS cents/kWh)
Revenues from electricity billed per unit of electricity (kWh) billed

Revenues from electricity billed (BSD, millions)
Revenue from electricity sales only. Does not include revenue from connection charges or other services fees, or revenues from non-electricity activities.

Revenues from electricity billed, High voltage Commercial (BSD, millions)
Revenue from electricity billed to high voltage customers, the majority of whom are Large Commercial customers.

Revenues from electricity billed, Medium voltage commercial (BSD, millions)
Revenues from electricity billed to medium voltage customers, the majority of whom are commercial customers.

Revenues from electricity billed, Residential and low voltage business (BSD, millions)

Revenues from electricity billed to residential and other low voltage customers (e.g., commercial).

ANNEX V: REPORTING TEMPLATE (SEE –MICROSOFT EXCEL FILES)