REGULATION OF ELECTRICITY TRANSMISSION AND DISTRIBUTION

November 1, 2023 to October 31, 2028

FINAL DETERMINATION

(RATES AND MISCELLANEOUS CHARGES)

Regulated Industries Commission

1. Background

1.1. Under Sections 47 and 48 of the Regulated Industries Commission Act Chapter 54:73, the Regulated Industries Commission (RIC) is responsible for setting maximum rates and/or principles for determining rates and charges for service providers and services specified in Schedule 1 and 2 of the RIC Act.

1.2. In undertaking its responsibilities referred to in 1.1 above, the RIC took into account a broad range of matters, including the criteria set out in Section 67 (3) and (4) of the RIC Act, which impacted on the establishment of appropriate annual revenue requirements.

1.3. In accordance with Sections 47 and 48 of the RIC Act, the RIC has fixed the maximum rates for the initial year of the price control period and the principles which will be the basis for determining the maximum rates and charges, hereinafter referred to as maximum tariffs, for the Trinidad and Tobago Electricity Commission (T&TEC).

2. Application of this Determination

2.1. This Determination sets the maximum tariffs for 2023 and the principles for determining the maximum tariffs that T&TEC may charge for its services from the commencement date to October 31, 2028 (the regulatory control period – PRE2).

2.2. This Determination commences on November 1, 2023 (commencement date).

3. Monitoring

3.1. The RIC will monitor the performance of T&TEC for the purposes of:

- establishing and reporting on the level of compliance by T&TEC with this Determination; and
- preparing a periodic review of pricing policies (Annual Tariff Adjustment).

4. Schedules

4.1. Schedules 1-7 (inclusive) and the tables in those Schedules set out the maximum tariffs that T&TEC may charge for its services and other related matters.

5. Definition and Interpretation

5.1. Definitions and interpretation used in this Determination are set out in Schedule 7.

SCHEDULE 1

STATEMENT OF REASONS UNDER SECTIONS 47 AND 48 OF THE RIC ACT

Under Sections 47 and 48 of the RIC Act, the RIC may set maximum rates, determine the principles for setting maximum tariffs or both. In this Determination, the RIC has set maximum rates for the year 2023 and has included a formula based on its methodology for setting the maximum revenue for each remaining year of the regulatory control period.

SCHEDULE 2

TARIFF STRUCTURE 2023

For the first year of the regulatory control period, the RIC has set the tariff structure and the maximum rates that can be charged by T&TEC for each customer class; these are indicated in **Table 1.**

Table 1 – Tariffs for 2023

Rate Class		Energy Charge ($/kWh)	Customer Charge ($)	Demand Charge ($/KVA)
Residential (Monthly) kWh Range				
1	200	0.2800		
201	700	0.4000	7.50	NA
701	1400	0.5400		
>1400		0.6800		
Commercial (Monthly)				NA
B1		0.5600	35.00	
B2		0.6700	35.00	
Industrial (Monthly)				
C1		0.6269	50.00	93.00
C2		0.5858	50.00	93.00
C3		0.5487	50.00	93.00
C4		0.5114	50.00	93.00
D1		0.3145	50.00	79.00
D2		0.3508	50.00	80.45
D3		0.3126	50.00	72.00
D4		0.2723	50.00	65.20
D5		0.2608	50.00	60.31
E1		0.3306	100.00	97.01
E2		0.3306	100.00	95.04
E3		0.3306	100.00	93.74
E4		0.3306	100.00	92.40
E5		0.3306	100.00	91.43
Public Lighting (Monthly)				
Street Lights		82.50		
Traffic Lights		71.50		
Recreation Grounds		306.50		

*** B1 (formerly B) customers**
****Minimum Bill of 5000 kWh applies to B2 (formerly B1) customers.**
N/A – not applicable

SCHEDULE 3

REVENUE CAP FOR TRANSMISSION AND DISTRIBUTION SERVICES

Allowed revenues will be escalated annually by applying the RPI-X formula from November 1, 2024.

Maximum tariffs for year *t* will be set such that the reasonable forecast annual revenue received (ARR_t) from the service complies with the formula in **Box 1**. All annual adjustments to maximum tariffs will be approved by the RIC in accordance with Schedule 6.

Box 1 – Formula for Establishing Annual Revenue

$$*ARR_t \leq [(1 + RPI)(1 - X_t)] \times ARR_{t-1} + U$$

Where:

Year $_t$	**X_t**
2024	1.3%
2025	1.3%
2026	1.3%
2027	1.3%

ARR = Annual Revenue Requirement received from Services.

ARR_{t-1} = Annual Revenue Requirement received from Services in the previous year, and ARR_{2023} is $4893.83 million.

RPI = the Retail Price Index which has been fixed for the purpose of the RIC's calculation at 4.7% per year.

X = The efficiency factor.

U = Unused charge. T&TEC will be permitted to carry over any unused change in charges from one year to the following years.

The overall side constraint is set at (RPI + X) = 6.0%.

SCHEDULE 4

MISCELLANEOUS SERVICES

The following Miscellaneous Services will be regulated by the RIC and the prices for these services are as set out below in **Table 2**. The charges for regulated services may be amended by the RIC at the mid-point of the second control period, based on the approved charging principles.

Table 2 – Miscellaneous Charges

	Charge ($)
• Meter check at customer's request: - If found in working order - If found defective	 246.00 No charge
• Visit for non-payment of account	297.00
• Install meter and reconnect secondaries	246.00
• Reconnect, disconnect and/or change meter	246.00
• Reposition of secondaries	246.00
• Change and/or reposition meter	246.00
• Disconnection for non-payment	150.00
• Reconnection after disconnection for non-payment	150.00
• HV isolation during normal working hours	4,689.36
• HV isolation during weekends and public holidays	16,300.44
• Direct single phase temporary supply	3,024.70
• Direct three phase temporary supply	5,718.41
• Temporary Supply (URD) "Stick in meter"	2,131.44
• Transformer Rentals	408.00 - 2,400.00*

*There is a range of monthly charges for transformer rentals, depending on size of the transformer.

SCHEDULE 5

SERVICE DEPOSITS

The new service deposit charges will become effective on date(s) to be determined by the RIC.

Service Deposits (SD) for customers requesting new accounts will be as follows:

Residential customers – $234.30 – the value of one month's average bill based on an average monthly kWh consumption of 627 kWh.

Commercial B1 customers, (formerly B) – $797.16 – the value of one month's average bill based on an average monthly kWh consumption of 1,361 kWh.

Commercial B2 customers, (formerly B1) – $3,385.00 – the minimum bill of 5,000 kWh.

Industrial customers – the value of one month's average bill (the higher of 75% reserve capacity or minimum kVA consumption).

High Density customers – a recommendation for the service deposit for High Density customers to be submitted by T&TEC within one month of the publication of the RIC's Final Determination. The SD for this category of customers will be retained until the account is closed.

SCHEDULE 6

ANNUAL PRICE APPROVAL PROCESS (ANNUAL TARIFF ADJUSTMENT) DURING

THE REGULATORY CONTROL PERIOD

The Annual Price Approval Process (Annual Tariff Adjustment) during the regulatory control period is set out below:

- At least three months prior to the beginning of each year of the regulatory control period, T&TEC shall submit to the RIC proposed tariffs which will apply from the start of each year of the regulatory control period.
- T&TEC shall ensure that its proposed tariffs comply with the established principles.
- T&TEC shall, if requested by the RIC, provide additional information and resubmit or revise its proposed tariffs.
- The RIC shall inform T&TEC in writing whether it has verified T&TEC's proposed tariffs as being compliant with the relevant established principles.
- The proposed tariffs shall be deemed to have been verified as compliant at the end of the three months from the date of receipt of T&TEC's Annual Tariff Approval Submission.
- T&TEC shall inform customers of the new tariffs at least twenty-one (21) days before implementation through publication in at least one daily newspaper in circulation in Trinidad and Tobago.
- T&TEC shall not introduce any new tariffs and/or tariff components during the regulatory control period other than those approved by the RIC.

SCHEDULE 7

DEFINITIONS AND INTERPRETATIONS

1. Definitions

In this Determination:

"Annual Revenue Requirement" – a forecast of the annual revenue requirement over a regulatory control period.

"Commencement Date" – November 1, 2023.

"Regulatory Control Period" – the period covered by this Determination, that is, November 1, 2023 to October 31, 2028 and referred to as PRE2.

"Retail Price Index (RPI)" – the general index of retail prices published by the Central Statistical Office (the CSO) of the Government of Trinidad and Tobago.

"RPI-X Formula" – a formula for regulation that involves setting price/revenue caps that are measured relative to the RPI.

"Service Providers and Service" – the service providers and services as defined in Schedule 1 and 2 of the RIC Act.

"X-factor" – productivity or general efficiency improvement factor.

2. Interpretation

2.1 General Provisions

In this Determination:

a) Headings are for convenience only and do not affect the interpretation of this Determination.

b) Reference to a law includes all amendments or replacement of that law.

2.2 Explanatory Notes and Clarification

a) Explanatory notes do not form part of this Determination, but in the case of uncertainty may be relied on for interpretation purposes.

b) The RIC may publish a clarification to correct any manifest error in this Determination as if that clarification formed part of this Determination.

2.3 Prices exclusive of VAT

Tariffs or charges specified in this Determination do not include value added tax (VAT).

2.4 Billing Cycle of T&TEC

All customer categories are to be billed monthly.

REGULATED
INDUSTRIES
COMMISSION

REGULATION OF ELECTRICITY TRANSMISSION AND DISTRIBUTION 2023 – 2027

FINAL DETERMINATION

November 1, 2023

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Preface

On November 26, 2021, the Trinidad and Tobago Electricity Commission (T&TEC) submitted its Business Plan (BP) to the Regulated Industries Commission (RIC). The BP included the prices it proposed to charge for transmission and distribution and other prescribed services for the coming five-year period. The submission also included other detailed information about its proposed strategies, initiatives, and revenue needs.

The RIC is required to assess the proposal in accordance with the provisions of the RIC Act Chapter 54:73 (Act). In particular, the RIC must decide whether to approve the proposed prices or alternatively, to specify the prices to apply if it is not satisfied that the proposed prices were calculated or determined in accordance with the Act.

The RIC has completed its assessment of T&TEC's proposal in accordance with the provisions of the Act, followed by an extensive consultation with the general public and special interest groups on the RIC's draft decisions as contained its Draft Determination Document. This document sets out the relevant issues, information and analysis underpinning the RIC's Final Determination of the maximum prices to be charged by T&TEC in 2023 and the price control mechanism for the electricity transmission and distribution sector which will apply over the remainder of PRE2, that is 2024 –2027.

Price adjustments for each year of the remainder of PRE2 will occur annually at the start of the regulatory year and will be known as the Annual Tariff Adjustment. These annual adjustments are integral to incentive regulation, which is the overall framework within which the RIC sets overall prices. The RIC understands the need that some customers may have to be informed of the specific rates that will apply for each year of the price control period; however, this framework does not lend itself to the forecast of specific rates. The RIC has, however, mandated that customers will be informed of any new or revised annual tariffs at least twenty-one (21) days before implementation.

While there may be price changes, the RIC has incorporated mechanisms to ensure that average revenue increases be no more than 6 percent annually. Further, because the rates for residential customers incorporate a level of cross subsidy, the RIC wishes to assure these customers that unwinding this cross subsidy will be done over time and will consider the issue of affordability. Indeed, affordability has been a cornerstone of PRE2, as substantial time has passed since the PRE1 occurred and the RIC has sought to minimise the impact of the rate increases, especially for residential customers. The RIC is acutely aware that rates must be affordable for all customers, particularly for vulnerable customers who are often on fixed incomes. However, all customers, especially residential customers, are asked to be mindful that their electricity costs are to some extent controllable and are strongly urged to practice energy efficiency and conservation. The RIC also emphasises that the regulatory settlement strikes an appropriate balance between the quality of service to be provided to customers and the prices that are to be paid.

It is now hereby stated that the RIC has, in exercising the power conferred by the Regulated Industries Commission Act, Chapter 54:73, determined the revenue requirement, expected revenue from charges, and the tariffs based thereon, which T&TEC shall accept and implement, along with related directives, as indicated in this document.

Signed, dated and issued by the Regulated Industries Commission on this day October 30th, 2023.

Dawn Callender

Chairman

Raye Sandy

Deputy Chairman

Cristian Mora

Commissioner

Christine Parris-Debique

Commissioner

Dave Seerattan

Commissioner

Earl Wilson

Commissioner

Fulton Wilson

Commissioner

Glossary of Terms and Definitions

Annual Investment Return	A report detailing the service provider's performance on capital projects against allowed capital expenditure projects.
Annual Revenue Requirement	A forecast of the annual revenue requirement over a regulatory control period.
Advanced Metering Infrastructure (AMI)	Metering technology that comprises several elements used for billing and other customer centric functions, for example, outage management.
Benchmarking	The comparison of the performance of various utilities, providing similar services, in a specific area/field (financial/technical/operational).
British Thermal Units (BTU)	The amount of heat required to increase the temperature of one pound of water by one degree Fahrenheit, at a constant pressure of one atmosphere.
Building Block Approach	The approach for deriving forecast revenue requirements that is the sum of a return on the regulatory asset base including net new investment (return on assets), a return of the regulatory asset base (depreciation) and efficient operating, maintenance and administrative costs.
Business Plan	The submission by the service provider that sets out the rates/price limits requested for the duration of the regulatory control period and its justification for same.
Customer Average Interruption Duration Index (CAIDI)	The average time required to restore service. It is calculated by dividing the total interruption durations by the total number of outages.
Capex	The money spent to buy, maintain, or improve the service provider's fixed assets, such as buildings, vehicles, equipment, or land.
Cost of Capital	The minimum return that providers of capital require to induce them to invest.

Cost Pass-Through	Component of incentive regulation that caters for uncontrollable costs. (See Uncontrollable Cost).
Cross-Subsidy	The subsidisation of a particular customer group by another group.
Demand	The rate at which electric energy is delivered to or by a system or part of a system at a given instant or averaged over any designated interval of time. Generally expressed in kilowatts (kW), megawatts (MW), or gigawatts (GW).
Demand Charge	A fee based on the peak amount of electricity used during the billing cycle.
Demand Side Management (DSM)	Programmes to influence the amount or timing of customers' energy use.
Depreciation	A measure of the consumption, use or wearing out of an asset over the period of its useful economic life. It is also referred to as Return of Capital.
Discounted Cash Flow	A method used to value investment by adjusting the estimated future cash flows, for the time value of money. It is utilised in Net Present Value analysis.
Economic Life	The economic life of an asset is the period for which an asset remains useful.
Efficiency Carryover Mechanism	A mechanism that provides the service provider with a continuous incentive to achieve efficiency gains.
Energy Conservation	The practice of using less energy, either by greater energy efficiency or by decreasing the types of applications requiring electricity or natural gas to operate.
Energy Efficiency	Using less energy (electricity and/or natural gas) to perform the same function at the same level of quality. Programmes designed to use energy more efficiently by doing the same with less.

Financial Indicators	Financial ratios (such as gearing, interest cover and dividend cover) used to measure the financial performance of a company.
Gearing	A service provider's net debt expressed as a percentage of its total capital.
Gigawatt hours (GWh)	A measure of consumption that is equivalent to 1,000,000 Watt hours.
Inclining Block Tariffs	A tariff structure where the incremental unit price increases as the level of consumption increases.
Indexation	The policy of connecting prices, costs, wages etc. to rises in the general price level, retail prices or other measures of prices (inflation).
Interim Determination	A condition that allows the regulator to make, in any year during the regulatory control period, adjustments to the price limits for relevant changes of circumstances, provided these are material.
Investment Programme	A schedule of planned investment (network and non-network related) to be undertaken to provide continuing services to customers.
Independent Power Producer (IPP)	A private entity that operates a generation facility and sells power to electric utilities for resale to retail customers.
Kilojoule (KJ)	A joule is a measure of work or energy in the International System of Units. A kilojoule is 1,000 joules.
Kilowatt (kW)	A measure of demand for power.
Kilowatt-hour (kWh)	A measure of consumption. It is the amount of electricity that is used over some period of time, typically a one-month period for billing purposes.
Kilovolt (kV)	The equivalent of 1,000 volts.

Load	An end use device or customer that receives power from an energy delivery system. Load should not be confused with Demand, which is the measure of power that a load receives or requires (See Demand).
Logging Up and Down	An adjustment that takes place at the end of the regulatory control period to reflect differences in cost from the original determination.
Marginal Cost	The cost to the utility of providing the next (marginal) kilowatt-hour of electricity, irrespective of sunk costs. A distinction is often made between Short Run Marginal Cost (SRMC) which is the change in total cost when an additional unit of output is produced and at least one cost input remains fixed. Long Run Marginal cost (LRMC) is the change in total cost when an additional unit of output is produced, and all input costs are variable.
Megawatt-hour (MWh)	The unit of energy equal to that expended in one hour at a rate of one million watts.
Net Present Value (NPV)	The economic value of a project, at today's prices, calculated by netting off its discounted cash flow from revenues and costs over its full life.
Nominal Terms	Values expressed in the year of occurrence but ignoring changes in the purchasing power of money.
Opex	Operating Expenditure (comprising day-to-day running costs).
P_0 adjustment	A permanent percentage reduction in prices as a result of efficiency gains that have been achieved by the utility.
Peak Load or Peak Demand	The electric load that corresponds to a maximum level of electric demand within a specified period.
Performance Indicators Report	The annual report published by the RIC that assesses T&TEC performance using targets (originally established in PRE1).

Rate of Return	The annual income and capital growth from an investment, expressed as a percentage of the original investment.
Real Terms	The value of money expressed in constant dollar terms.
Regulatory Asset Base (RAB)	The value of the regulated business assets used to derive a forecast revenue requirement under the building block approach. The RAB is used for regulatory price setting purposes only and is different to the value that the utility may adopt for accounting purposes. The RAB is updated for new capital expenditure, depreciation and disposals.
Regulatory Control Period/Regulatory Period/ Control Period/Price Control Period	The period covered by a price determination made by the regulator.
Retail Price Index (RPI)	The general index of retail prices published by the Central Statistical Office (the CSO).
Revenue Requirement/s	A forecast of the revenue required over a regulatory control period.
RPI-X Regulation	A form of regulation that typically involves setting price caps that are measured relative to the RPI.
System Average Interruption Duration Index (SAIDI)	It indicates the total duration of interruption for the average customer during a predefined period. It is commonly measured in minutes or hours of interruption. It is calculated by dividing the total number of interruption durations by the total number of customers.
System Average Interruption Frequency Index (SAIFI)	It indicates how often the average customer experiences a sustained interruption over a predefined period. It is calculated by dividing the number of customer interruptions by the total number of customers served.
Sunk Cost	In economics, this is a cost that has already been incurred, and therefore cannot be avoided by any strategy going forward.

Supervisory Control and Data Acquisition (SCADA)	A category of software applications for controlling industrial processes, which requires the gathering of data in real time from remote locations to control equipment.
Time-of-Use (TOU) Rates	The pricing of electricity based on the estimated cost of electricity during a particular time block.
Transformer	A device for reducing or increasing the voltage of an alternating current.
Transmission Network	The network used for transmission of high voltage electricity through high voltage overhead power lines, transformers and other high voltage equipment and installations, from the point of receipt from the electricity producers or interconnection electricity lines to the point of delivery.
Trigger Event	A materiality threshold to limit cost pass-throughs to events that have a significant impact on the service provider's costs, while avoiding the risk of introducing a cost-plus regulation regime. A one percent materiality threshold is considered to be reasonable and is typically used.
Uncontrollable Costs	Costs over which the actions of the service provider have little or no effect.
Unders and Overs account	A notional account that is used to track the actual revenues of the service provider against forecast revenues at the end of each financial year of the control period.
Weighted Average Cost of Capital (WACC)	The average of cost of debt and cost of equity capital, weighted according to the balance of debt and equity which finances the utility's assets.
X-factor	This is a theoretical concept, based on the firm's expected productivity increases over the relevant period. Under the building block methodology, it is used to smooth the revenue or price path during the regulatory control period.

EXECUTIVE SUMMARY

1. INTRODUCTION

This is the Regulated Industries Commission's (RIC's) Final Determination on the regulation of Electricity Transmission and Distribution services for the period November 1, 2023 to October 31, 2028, hereinafter referred to as PRE2.

On November 26, 2021, in response to the RIC's request under Section 48 of the Regulated Industries Commission Act, the Trinidad and Tobago Electricity Commission (T&TEC) submitted the prices it proposed to charge for transmission and distribution and other prescribed services for the five-year period under review. The RIC assessed the proposal and specified the pricing methodology to apply in accordance with the provisions of its Act. In so doing, the RIC fixed the maximum rates for the initial year of the price control period and the principles which will be the basis for determining the maximum rates and charges for the Trinidad and Tobago Electricity Commission (T&TEC) for the remaining years of the price control period.

This document has been informed by a public consultation process, which involved interested stakeholders providing written comments to the RIC in response to twenty (20) technical papers that were published between 2021 and 2022 and a Draft Determination that was published on January 6, 2023. The RIC held fifteen face-to-face public consultations throughout the country to discuss the Draft Determination and held twenty-four (24) meetings with special interest groups during the 12-week period to March 31, 2023. The RIC also made eight (8) appearances on national television and radio over the period and provided information via the national print media. The RIC has also published a document entitled "RIC's Response to Comments Received from Stakeholders on its Draft Determination for PRE2". The Final Determination was completed after careful consideration of the comments received from stakeholders on the Draft Determination, and sets out the relevant issues, information and analysis underpinning the RIC's final decisions.

2. THE CONTEXT AND OBJECTIVES OF THE SECOND REVIEW (CHAPTER 1)

The RIC is required to take account of a wide range of factors in making its decisions to ensure a balance between the needs and interests of different stakeholders. The review of rates and charges for T&TEC is occurring at a challenging time. On the one hand, the world faces the task of mitigating the effects of climate change, while on the other hand, the global economy is struggling to cope with volatile energy prices and supply chain disruptions. In respect of worsening climate issues, the conservation of electricity can assist in reversing this trend.

Trinidad and Tobago, as a net exporter of energy products, has been better placed to cushion some of these impacts. According to the Review of the Economy 2022, "the country has been learning to live with the COVID-19 virus, the Trinidad and Tobago economy is now on a path to recovery and growth, amidst concerted efforts towards rebuilding what was detracted by the pandemic." Indeed, the economy grew by 1.5 percent in 2022, reversing a 1 percent decline in 2021[1]. This does not mean, however, that some citizens have not had challenges meeting their monthly household expenditure. These are the major circumstances that the RIC has had to navigate while conducting its review. Among its primary responsibilities, the RIC must ensure that electricity prices are affordable, and that T&TEC has the funding necessary to provide reliable and quality services to the public. The challenge for the regulator is how to set prices that would allow T&TEC to provide reliable services and still make these services affordable to citizens.

The purpose of the Price Review is to determine an appropriate level of allowed revenue for T&TEC, and the level and structure of tariffs that customers will pay for PRE2. In setting the allowed revenue and starting tariffs for 2023, the RIC's objectives are to ensure that:

- the service provider operating under prudent and efficient management can earn sufficient returns to finance necessary investments. In doing so, the RIC wants to ensure that the service provider's planned investments are necessary and provide value for money for customers;

[1] See "Review of the Economy 2023", published by Ministry of Finance, Trinidad and Tobago, 2023.

- the interests of customers are protected, in the short and long term, by ensuring that services are reliable and provided at the lowest possible cost; and
- appropriate incentives are provided for the service provider to improve its efficiency where possible, and most of the savings that result from efficiency gains are passed through to customers.

3. THE FRAMEWORK

Section 48 of the RIC Act Chapter 54:73 mandates that reviews be conducted every five (5) years or where the licence issued to the service provider prescribes otherwise, at such shorter intervals as it may determine. The five-year control period ensures that customers are protected, while offering the service provider a clear and stable environment to make the necessary investments to ensure a modern and efficient network and high levels of service.[2]

As with PRE1[3], the RIC has adopted an incentive-based model to determine the service provider's allowed revenue. This approach ensures that the service provider can, through efficient operation, earn a fair return on capital and meet its operating costs. The service provider's costs and revenues are taken as fixed for a five-year period. If the service provider spends more than is allowed, it bears the cost but if it spends less than what it is allowed, through improvements in efficiencies, it can keep the surplus made in any one year for a period of five years to incentivise efficiency. Customers benefit over time from the progressive decrease in costs allowed at subsequent price reviews.

The RIC sets operating expenditure (Opex) and capital expenditure (Capex) based on the plans submitted by the service provider, and through a combination of assessment of specific underlying costs of the service provider and benchmarking. The service provider is required to manage its Opex and Capex within the allowed levels. The RIC monitors expenditure and conducts a review at the end of the control period to ensure that costs were efficiently incurred, and the Capex was necessary and prudent. The review of both Opex and Capex takes into account windfall gains and losses.

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[2] Some regulators have begun to employ longer price controls, for example, the Office of Gas and Electricity Markets (Ofgem) has moved to an eight-year regulatory period.

[3] PRE1 refers to the RIC's first price control for the electricity transmission and distribution sector which covered the period June 1, 2006 – May 31, 2011.

4. APPROVED REVENUE FOR 2023–2027

The revenue approved by the RIC for recovery through tariffs during the 2023–2027 period is shown in Table ES1 below. The approved revenue is determined after the RIC makes adjustments for efficiencies to ensure that only efficient costs are recovered through tariffs.

The RIC's approved revenue requirement, exclusive of NGC debt, is $2,818.88 million lower than T&TEC's proposal over the five (5) years of this regulatory control period. This difference reflects a number of decisions to ensure efficiency and prudency, including reductions in:

- forecast of operating expenditure ($1,512.98 million);
- conversion ($181.26 million);
- fuel costs ($528.22 million); and
- depreciation charges ($444.74 million).

The RIC included $1,157.42 million into the revenue requirement to cover a portion of the outstanding sum of $3,832.50 million payable to the National Gas Company (NGC) for natural gas purchased from 2019–2022. The total revenue requirement is considered sufficient for T&TEC to adequately meet the expenditure required to effectively exercise its core functions and comply with quality-of-service standards and other RIC requirements for improvement in customer service.

Table ES 1: Requested & RIC's Approved Revenue Requirements, 2023–2027 ($Million)

	T&TEC REQUESTED	RIC APPROVED	2023	2024	2025	2026	2027
Conversion Cost	9,612.93	9,431.67	1,764.99	1,788.45	1,936.61	1,957.72	1,983.90
Fuel Cost	10,564.19	10,035.97	1,752.22	1,859.74	2,023.37	2,139.51	2,261.13
T&D Cost	6,663.11	5,150.13	1,013.73	1,051.54	1,046.33	1,030.73	1,007.80
Depreciation	1,844.44	1,399.70	279.27	279.02	280.55	280.03	280.83
Return on Capital	1,466.88	1,447.90	282.97	287.35	290.00	291.82	295.76
Return on Working Capital	140.33	12.63	1.53	1.54	1.56	3.99	4.01
Unsmoothed Revenue Forecast	**30,291.88**	**27,478.00**	**5,094.71**	**5,267.64**	**5,578.42**	**5,703.80**	**5,833.43**
Less: Revenue from Non-Tariffs*	1,000.00	1,005.00	201.00	201.00	201.00	201.00	201.00
Unsmoothed Rev. Req. before NGC Debt	**29,291.88**	**26,473.00**	**4,893.71**	**5,066.64**	**5,377.42**	**5,502.80**	**5,632.43**
Add: NGC Debt	-	1,157.42	-	-	-	578.71	578.71
Unsmoothed Rev. Req.	**29,291.88**	**27,630.42**	**4,893.71**	**5,066.64**	**5,377.42**	**6,081.51**	**6,211.14**

*This includes dividend income from PowerGen, capital contribution, pole and transformer rentals.

The RIC's allowed Capex for PRE2 is $1,677.3 million, which is $561.4 million, or 25% less than that requested by T&TEC. The difference reflects several decisions, including:

- reduction of Capex for projects that were deemed not to be prudent[4];
- exclusion or ring-fencing of projects to be funded by Government;
- revaluation of expenditure on projects that were too loosely defined and lacking supporting information and project detail;
- adjustment for expenditure on projects with similar components/materials but with inconsistencies in costing; and

[4] Prudency establishes whether the decision to invest is wise, given the particular and specific circumstances at the time.

- exclusion of expenditure for projects whose duration extended beyond the second control period, and inclusion of only the costs associated with the parts of the project works which will terminate within the control period.

In addition to the above reductions in Opex and Capex, the RIC also requires that the service provider deliver additional efficiency savings of 2% each year (non-cumulative), the benefits of which will be passed on to customers within the 2023–2027 period. These efficiency savings amount to $104.26 million, and will be determined by the service provider as they have not been specified by the RIC.

Capital expenditure deemed prudent and efficient over the regulatory control period is added to the regulatory asset base (RAB), resulting in higher depreciation charges and capital costs. The RIC's approved depreciation charge is $1,399.70 million for the second control period, which compares to T&TEC's request of $1,844.44 million. The difference is primarily due to the lower capital expenditure allowance by the RIC.

The RIC recognises that the service provider will have to access the capital market to fund its Capex programme and is aware of the importance of providing regulatory certainty. The RIC has allowed a return on capital to remunerate debt based on a forward-looking rate and has approved a return on capital of 5.1% which, when applied to the RAB, equates to an allowance of $1,447.90 over the 2023–2027 period. The RIC believes that its decision to allow the return on capital of 5.1% will support strong credit quality and efficient funding of the investment programme in the short to medium term.

The RIC's decisions for PRE2 provide significant incentives for T&TEC to encourage improvements in operational efficiency. However, there is also the potential reward to the service provider of retaining any efficiency savings beyond those required by the RIC for a rolling five-year period.

5. PRICE DETERMINATION

The Final Determination in respect of electricity transmission and distribution services will apply for the five-year period 2023 to 2027:

i) Tariffs for Transmission and Distribution Services

For the first year of the regulatory control period 2023–2027, the RIC has proposed a tariff structure and prices for each customer class (see Table ES2).

Table ES 2: Tariffs for 2023

Rate Class		Energy Charge ($/kWh)	Customer Charge ($)	Demand Charge ($/KVA)
Residential (Monthly) kWh Range			7.50	NA
1	200	0.28		
201	700	0.40		
701	1400	0.54		
>1400		0.68		
Commercial (Monthly)				NA
B1		0.56	35.00	
B2		0.67	35.00	
Industrial (Monthly)				
C1		0.6269	50.00	93.00
C2		0.5858	50.00	93.00
C3		0.5487	50.00	93.00
C4		0.5114	50.00	93.00
D1		0.3145	50.00	79.00
D2		0.3508	50.00	80.45
D3		0.3126	50.00	72.00
D4		0.2723	50.00	65.20
D5		0.2608	50.00	60.31
E1		0.3306	100.00	97.01
E2		0.3306	100.00	95.04
E3		0.3306	100.00	93.74
E4		0.3306	100.00	92.40
E5		0.3306	100.00	91.43
Public Lighting (Monthly)				
Street Lights		82.50		
Traffic Lights		71.50		
Recreation Grounds		306.50		

***B1 (formerly B) customer**

**** B2 (formerly B1) customers have a minimum monthly bill of 5000 kWh.**

ii) Regulated Miscellaneous Services

The following miscellaneous services are already regulated by the RIC and the prices for these services in year 1 of PRE2 are set out in Table ES3 below:

Table ES 3: Regulated Miscellaneous Services and Charges from 2023

	Charge ($)
• Meter Check at customer's request: - If found in working order - If found defective	 246.00 No charge
• Visit for Non-payment of account	297.00
• Install meter and reconnect secondaries	246.00
• Reconnect, disconnect and/or change meter	246.00
• Reposition of secondaries	246.00
• Change and/or reposition meter	246.00
• Disconnection for non-payment	150.00
• Reconnection after disconnection for non-payment	150.00

iii) New Regulated Charges

HV isolation, temporary supply and transformer rentals will be regulated miscellaneous services. **T&TEC will continue to apply the charges that were set for these services as shown in Table ES4.**

Table ES 4: New Regulated Charges

New Miscellaneous Service	**Interim (2023) Charges TT$**
HV isolation during normal working hours	4,689.36
HV isolation during weekends and public holidays	16,300.44
Direct single phase temporary supply	3,024.70
Direct three phase temporary supply	5,718.41
Temporary Supply (URD) "Stick in meter"	2,131.44
Transformer rentals	408 - 2,400*

*There is a range of monthly charges for transformer rentals, depending on size of the transformer.

By the end of the second year of PRE2, **T&TEC is required to submit a detailed breakdown of the typical costs to provide HV isolation, temporary supply, and transformer rental services.** This information will form the basis upon which the RIC may determine new charges to be applied by the mid-point of PRE2.

iv) Tariff Implementation 2024–2027

Tariff structure

Allowed revenues will be escalated annually by applying the RPI-X formula. Maximum tariffs for year *t* will be set such that the reasonable forecast annual revenue requirement (ARR_t) received from the service complies with the formula in **Box ES 1**.

Box ES 1: Formula for Establishing Annual Revenue Requirement

$$\mathbf{ARR_t \leq [(1 + RPI)\,(1 - X_t)] \times ARR_{t-1} + U}$$

Where:

Year $_t$	**X_t**
2024	1.3%
2025	1.3%
2026	1.3%
2027	1.3%

ARR = Annual Revenue Requirement received from Services.

ARR_{t-1} = Annual Revenue Requirement received from Services in the previous year, and ARR_{2023} is $4893.83 million.

ARR_{2023} = $4893.83 million.

RPI = the Retail Price Index which has been fixed for the purpose of the RIC's calculation at 4.7% per year.

X = The efficiency factor

U = Unused charge. T&TEC will be permitted to carry over any unused change in charges from one year to the following years.

The overall side constraint is set at (RPI + X) = 6.0%.

Side Constraint

The overall side constraint is set at (RPI + X) = 6.0%.

v) Tariff Implementation

T&TEC's Board must inform the RIC if a decision is taken not to charge the maximum determined price, providing reasons for its decision. Further, T&TEC must report annually on the implementation of the tariffs. In this regard, a written report must also be provided on whether the RIC's recommendations/directives that are made in its annual pricing policy (tariff adjustment) reviews have been implemented, and reasons must be given for any non-implementation thereof.

vi) Annual Price Approval Process (Annual Tariff Adjustment) during the Control Period

- At least three months prior to the beginning of each year of the regulatory control period, T&TEC must submit proposed tariffs to apply from the start of each year of the regulatory control period.
- T&TEC must ensure that its proposed tariffs comply with RIC's established principles.
- T&TEC must, if requested by the RIC, provide additional information and resubmit or revise its proposed tariffs.
- The RIC must inform T&TEC in writing whether it has verified T&TEC's proposed tariffs as compliant with the relevant established principles.
- The proposed tariffs will be deemed to have been verified as compliant by the end of three months from the date of receipt of T&TEC's Annual Tariff Approval Submission.
- T&TEC must inform customers of the new tariffs at least twenty-one (21) days before implementation through publication in at least one daily newspaper in circulation in Trinidad and Tobago.
- T&TEC is prohibited from introducing new tariffs and/or tariff components during the regulatory control period other than those approved by the RIC.

vii) Trigger Event

The trigger event will only apply if a situation imposes a total annualised cost of more than 1% of revenue.

Overall Impact of Tariffs

The RIC has assessed the impact of its first-year tariffs for PRE2 on the three main customer categories (residential, commercial and industrial). The impact on individual customers (within these three broad categories) will be dependent on their actual monthly consumption. Notwithstanding, some of the overall impacts are as follows:

- **Residential customers** at the lower consumption levels (for example, 200 kWh per month) will see an increase of 15% and receive a bill of $63.50 monthly. Residential customers whose average consumption is 627 kWh per month will receive a bill of $234.30 per month or an 18% increase when compared on a two-month basis. Since the residential tariff structure is an inclining block, it should be noted that the percentage increases in monthly bills can vary for customers whose consumption fall within the higher tiers. For instance, consumers who are currently using 3000 kWh bi-monthly will experience a 36% increase over a two-month period, while those using 4,000 kWh bi-monthly will see a 49% increase.

- **Commercial (B1) customers** will see an increase in their bills in the range of 37%–51%. Commercial customers whose average consumption is 1,361 kWh per month, will see an increase of 38% and receive a bill of $797.16 per month. **Commercial (B2) customers** will experience an increase in their monthly bills of approximately 10%–11%.

- **Industrial D customers**, depending on their particular sub-class, will experience an increase ranging between 58% and 70%. **Industrial E customers,** depending on their particular sub-class, will experience an increase ranging between 119% and 126%.

- **Impact on household expenditure and welfare** – In establishing these rates, the RIC remained within World Bank guidelines on the percentage of expenditure that should be spent on electricity. In each case, the RIC has attempted to set rates which would not exceed the international guidelines.

- **Impact on Country's Competitiveness** – Despite the increases, and on the assumption that electricity costs have been averaged to represent 1.5% of total costs across industries, the expectation is that the increased costs of electricity would not have a major impact on total operating expenses of different industries in the country.

- **Financial Impact on the Service Provider** – The tariff increases will deliver two major outcomes for T&TEC: a healthy and sustainable financial outcome, and a specified capital works programme. The tariffs also meet the financial viability criteria, as required under the RIC Act.

6. OVERVIEW OF FINAL DECISIONS AND DIRECTIVES (CHAPTERS 2–13)

Apart from the new tariffs and charges for PRE2, the RIC will mandate T&TEC to comply with the undermentioned directives. The RIC will assess T&TEC's compliance with directives as a basis for determining whether to approve annual increases.

a) RIC's Tariff Setting Approach (Chapter 2)

This chapter discusses some of the key elements of the RIC's regulatory process. Many of these elements are similar to those employed by other well-established regulators. The decisions/directives are to utilise:

- a five-year price control for PRE2.
- a fixed (total) revenue cap as the appropriate form of price control for PRE2, supplemented by a profit-sharing mechanism if profits were to exceed 10% of total revenue, a notional unders and overs account, and a side constraint on annual increases in revenue as detailed in the revenue cap formula.
- an efficiency carryover mechanism.
- a building block approach to estimate the forecast revenue requirements.

b) Regulatory Asset Base (Chapter 3)

This chapter details the complex issues which go into the determination of the Regulatory Asset Base (RAB), and depreciation. The RAB is the accumulated value of the assets used in providing regulated services. It plays a key role in the determination of the amount of depreciation that the service provider receives (commonly referred to as the "return of") and is the base to which the rate of return/cost of capital is applied when determining the return on capital assets. The RIC's approved Annual Values of the RAB for each year of PRE2 are shown in Table ES5.

Table ES 5: RIC's Approved Annual Values of RAB ($'000)

	2023	2024	2025	2026	2027
Opening Value	5,415,045	5,700,732	6,026,476	6,198,458	6,350,224
Inflation Adjustment	249,092	216,628	126,716	123,969	120,654
Capex	316,870	389,140	326,820	308,830	335,660
Less Depreciation	(279,275)	(279,024)	(280,554)	(280,033)	(280,835)
Less Disposals	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)
Closing RAB	5,700,732	6,026,476	6,198,458	6,350,224	6,524,703

The other decisions include:

- utilising the acquisition approach, indexed with inflation to value assets for establishing the RAB.
- applying the straight-line method of depreciation to calculate the allowance for regulatory depreciation for PRE2.

c) Cost of Capital (Chapter 4)

This chapter discusses the rate of return or cost of capital. The service provider must be able to finance its operations. The cost of capital (allowed return) when applied to the asset base of the service provider enables it to meet its cost of debt financing and provide a return on investment.

- The RIC's decision is to allow a current or forward-looking cost of capital for new debt of 5.1% and not to include a return to the Shareholder (Government). If there is a significant change in circumstances, the RIC may review the cost of capital at the mid-term of the control period to determine if an adjustment is required for the remainder of PRE2.

d) Review of Electricity Demand and Customer Forecasts (Chapter 5)

This chapter discusses matters related to forecasting of electricity demand, customer forecasts and peak demand. Under the revenue cap framework, the effects of the forecasts do not impact the total revenue collected, but instead, impact the timing of revenue collection. If the forecast is too high then less revenue is collected than intended resulting in higher tariffs in subsequent periods, and vice versa. Additionally, to reduce the effects of the forecasts, the RIC places greater reliance on the revised forecasts as submitted at the annual price/tariff approval process.

The RIC's decision is to utilise the demand forecast for customer numbers and energy consumption shown in Table ES6.

Table ES 6: Forecasts to be used for Pricing Purposes 2023–2027

	2023	2024	2025	2026	2027
Electricity Sales (GWh):					
Residential	3,257	3,308	3,358	3,408	3,458
Commercial	952	955	959	963	966
Industrial	4,164	4,404	4,439	4,478	4,519
Public lighting	136	138	141	143	146
Total	**8,509**	**8,805**	**8,897**	**8,992**	**9,089**
Customer Numbers:					
Residential	464,148	471,141	478,134	485,127	492,120
Commercial	56,801	57,171	57,667	58,689	59,702
Industrial	4,018	4,086	4,154	4,221	4,289
Public lighting	48	48	48	48	48
Total	**525,015**	**532,446**	**540,003**	**548,085**	**556,159**

e) Review of the Performance of T&TEC (Chapter 6)

This chapter discusses T&TEC's productivity, financial performance and average tariffs over the period 2017–2021. As part of a price review, it is important to have an overall understanding of the service provider's performance in areas, such as its service delivery and financial performance.

f) Operating Expenditure (Chapter 7)

This chapter discusses operating expenditure, which covers the typical costs of running the utility and includes all staff costs, repairs and maintenance, generation, fuel and overhead costs. In conducting the price review for PRE2, one of the key objectives was to ensure that only the efficient costs of providing services were passed through into tariffs and overall prices, and therefore the RIC's decisions on Opex are:

- to allow Employee Costs as detailed in Table ES7. The RIC expects T&TEC to adhere to targets related to overtime, and sick leave and absenteeism as any variation from these may lead to revenue adjustments at the beginning of the third control period (PRE3).

T&TEC must submit a detailed Report to the RIC, within 18 months of the publication of the Final Determination for PRE2. The Report must indicate the steps that have been undertaken and whatever measures are proposed to improve efficiency with respect to the size and composition of its transmission and distribution (T&D) crews. These proposals must take cognisance of relevant safety requirements. T&TEC must also outline the future changes regarding the composition of linesman crews for typical construction and maintenance jobs of the utility.

Table ES 7: Requested and Allowed Employee Costs, 2023–2027 ($Million)

	T&TEC Requested	RIC Approved	2023	2024	2025	2026	2027
Wages	1,789.92	1,372.05	293.62	303.58	282.81	258.97	233.07
Salaries	1,726.61	2,148.27	408.08	423.33	434.73	440.56	441.57
Overtime	402.05	246.42	49.12	50.88	50.23	48.97	47.22
NIS	0	213.20	42.50	44.02	43.46	42.36	40.86
Employee Related	1,545.58	429.17	81.95	84.70	86.75	87.80	87.97
Charged to Revenue	5,464.16	4,409.11	875.27	906.51	897.98	878.66	850.69

- to allow T&D Opex as shown in Table ES8.

Table ES 8: Requested and Allowed T&D Opex, 2023–2027 ($Million)

	T&TEC Requested	RIC Approved	2023	2024	2025	2026	2027
Labour Cost	5,464.16	4,409.11	875.27	906.51	897.98	878.66	850.69
Rates, Taxes and Insurances	98.25	92.92	16.21	17.32	18.50	19.77	21.12
Materials	193.69	179.29	37.10	36.47	35.85	35.24	34.63
Maintenance /Services	885.28	558.91	104.17	109.50	111.99	114.74	118.51
Rents	21.73	21.73	4.10	4.21	4.34	4.47	4.61
Subtotal	6,663.11	5,261.96	1,036.85	1,074.01	1,068.66	1,052.88	1,029.57
Less Promotional Cost	0	6.73	2.43	1.01	0.98	1.11	1.20
Total T&D before Efficiency Savings	6,663.11	5,254.39	1,034.42	1,073.00	1,067.68	1,051.77	1,028.37
Less Efficiency Savings (2% per annum)	0	104.26	20.69	21.46	21.35	21.04	20.57
Total Approved T&D Expense	6,663.11	5,150.13	1,013.73	1,051.54	1,046.33	1,030.73	1,007.80

- to undertake a study of Opex cost efficiency and present the report to the RIC within 30 months of the publication of the Final Determination.
- to allow conversion Costs shown in Table ES9.

Table ES 9: Allowed Conversion Costs, 2023–2027 ($Million)

	Capacity Cost		Energy Cost			Total Conversion Cost	
Year	**T&TEC's Requested**	**98% RIC Allowed**	**Traditional IPP**	**Solar PV**	**Total (100% RIC Allowed)**	**T&TEC's Requested**	**RIC Allowed**
2023	1,764	1,729	36	0	36	1,800	1,765
2024	1,787	1,752	37	0	37	1,824	1,788
2025	1,816	1,780	38	119	157	1,973	1,937
2026	1,835	1,798	39	121	160	1,995	1,958
2027	1,860	1,823	40	121	161	2,021	1,984
Total	**9,062**	**8,882**	**190**	**361**	**551**	**9,613**	**9,432**

- to allow fuel costs as shown in Table ES10.

Table ES 10: Allowed Fuel Costs, 2023–2027 ($Million)

Year	T&TEC Projected	RIC Allowed Fuel Cost (95%)
2023	1,844.46	1,752.22
2024	1,957.62	1,859.74
2025	2,129.87	2,023.37
2026	2,252.12	2,139.51
2027	2,380.12	2,261.13
Total	10,564.19	10,035.97

- that T&TEC provide the RIC with a quarterly report (as part of its quarterly submission of its regulatory accounts), including details related to the status of payment to the NGC. The RIC will assess the report and determine what appropriate regulatory actions need to be taken.
- to allow Total Operating Costs, 2023–2027 as shown in Table ES11.

Table ES 11: Total Operating Expenditure (Requested versus Approved), 2023–2027 ($Million)

	T&TEC Requested	RIC Approved	2023	2024	2025	2026	2027
Conversion Costs	9,612.93	9,431.67	1,764.99	1,788.45	1,936.61	1,957.72	1,983.90
Fuel Costs	10,564.19	10,035.97	1,752.22	1,859.74	2,023.37	2,139.51	2,261.13
Total T&D	6,663.11	5,150.13	1,013.73	1,051.54	1,046.33	1,030.73	1,007.80
Total Opex Charged to Revenue	26,840.23	24,617.77	4,530.94	4,699.73	5,006.31	5,127.96	5,252.83

g) Capital Expenditure (Chapter 8)

This chapter discusses the allowance for capital expenditure (Capex) within the revenue requirement. The allowance for capital expenditure (Capex) within the revenue requirement is provided *ex-ante*[5] and the quantum is based on a detailed review of the service provider's historical performance and efficiency of past Capex, and a rigorous examination of forecast

[5] Allowances for Capex set in advance of when the expenditure on capital projects actually occurs.

Capex. Capex enters the revenue requirement of the service provider indirectly through the return on capital and through the return of capital (or depreciation). More specifically, past Capex, deemed to be efficiently incurred, is included in the starting RAB and the forecast Capex is added to the forecast of the annual RAB for the succeeding control period. The RIC's decisions are:

- The General Manager of T&TEC must provide assurance, through certification, that T&TEC will fulfil regulatory mandates and desist from using tariff revenues for Capex activities not approved by the RIC, unless there is valid justification.
- The RIC for PRE3 and beyond will consider two options for dealing with over-spend in allowed Capex (as a result of cost overruns): where over-spends are determined to be inefficient, the associated excess spend may not be allowed in the RAB and where over-spends are determined to be efficient, the associated excess spend will be allowed in the RAB.
- The RIC, for PRE3 and beyond, will consider three options where allowed projects are not undertaken; adjust the revenue requirement for the subsequent regulatory period, provide rebates to customers to account for the excess returns on capital provided, or identify specific projects that any excess returns would be spent on, in order to improve the quality of service to customers. Where they are undertaken and the expenditure is less than the allowed amount, two options may be used; the RAB will be adjusted downward at the end of the period or the approved expenditure will be retained by T&TEC in the closing RAB with no adjustment for actual spending.
- The RIC, for PRE3 and beyond, where projects are cancelled or delayed for sound reasoning and the overall outcome of such a decision is beneficial to customers, will allow T&TEC to retain the revenue associated with such projects.
- The RIC will utilise "logging up" as required (this allows for the inclusion of Capex not previously funded in the current price control to be included and accounted for in the subsequent price control period – PRE3) and employ a Capex Information Quality Incentive for PRE3 (under this incentive, the service provider will be rewarded for its accuracy in forecasting, that is, if the service provider's forecast is within 10% of the RIC's assessment, the service provider will be provided additional income at the beginning of the next control period, equivalent to the allowed cost of capital multiplied by the difference in the RIC's allowed Capex and T&TEC's proposed Capex).

- The RIC's Capex Reporting Framework will include:
  - Implementation of a system of regular engagement with T&TEC to monitor Capex projects and ensure that Capex spend is in line with the RIC's allowances.
  - Establishment of a semi-annual reporting framework in which T&TEC will be required to submit Capex reports, which are suitable for public release. The RIC is hopeful that the conditionality of public reporting will encourage T&TEC to complete the allowed capital programme. Specifically, these reports will include information on the status of projects, particularly timing and cost variances. The format of these reports will be determined by the RIC, after discussion with T&TEC, inclusive of the level of granularity required.
  - Provision by T&TEC of detailed data on **each project** annually (to be called **Annual Investment Return[6]**). The information to be submitted in the Return will include:
    - forecast and actual project spend for the year;
    - explanations of financial variances;
    - total forecast spend on the project; and
    - physical progress of the project against defined milestones.
  - Establishment of fixed dates by which T&TEC must meet and achieve Capex-related directives. Where deadlines are not met, T&TEC will be held accountable.
  - Conduct of a mid-term review of Capex at the RIC's discretion.
  - Implementation of a Capex Safety Net – This allows for the review of the Capex allowance where the Capex underspend/overspend in any given year of the control period is greater than 20% of the allowed Capex.
  - Employment of Public Disclosure of Non-Compliance and/or Public Register notices on the RIC's website. Through these notices, the RIC will publish the occurrences about T&TEC's non-compliance with any targets set for its achievement, inclusive of allowed capital investment projects.

- For PRE3, the RIC **may require:**
  - The use of a self-assurance process, the details of which must be submitted by T&TEC to the RIC at the time of submission of a Business Plan, in which there is an assurance by T&TEC's General Manager that the Capex projections

[6] T&TEC will also be expected to submit quarterly returns to facilitate ongoing monitoring.

accurately reflect the underlying information base. This is an internal process which does not necessarily entail external scrutiny or assurance.

  - The employment of a "Reporter" (independent consultant/engineer) to interrogate T&TEC's proposed Capex for PRE3. The RIC will take the Reporter's proposals into account. The service provider will pay the Reporter's costs, but the Reporter is approved by the RIC and will report to the RIC.
  - The development and submission of detailed Asset Management Plans alongside longer-term capital investment plans, with a view to assess how T&TEC's proposed Capex relates to, and corresponds with same. The RIC may also require the service provider to include in its business plan a review of "unit cost" trends, where possible.
  - The continuation of detailed ex-post efficiency reviews of T&TEC's performance with respect to capital expenditures.

- The allowed Capex is as shown in Table ES12.

Table ES 12: Requested and Approved Capex, 2023–2027 ($Million)

	T&TEC Requested	RIC Approved
Transmission – Refurbishment and Replacement	272.2	212.0
Transmission & Sub-transmission – Development	98.0	32.4
Distribution	596.9	526.4
Street Lighting	57.9	54.6
Other Network Related	27.0	26.2
Non-Network Related	1,186.7	825.7
Total	**2,238.7**	**1,677.3**

h) Incentives and Performance Monitoring (Chapter 9)

Chapter 9 discusses Incentives and Performance Monitoring. An important consideration for the regulator is to set challenging and achievable levels of performance for the service provider to promote customers' interests. Consequently, the regulator must monitor progress against the minimum acceptable performance level that it sets, and verify that service levels do not decline as a result of any action by the service provider to reduce costs. During the regulatory control period, it is important to monitor T&TEC's progress in reducing costs and improving service levels. The RIC's decisions are as follows:

- **To continue to monitor the performance indicators and quality of service standards introduced in PRE1 and to publish T&TEC's performance accordingly in the RIC's Performance Indicator Report. T&TEC is also required to report semi-annually on its efforts to improve reliability, inclusive of the following measures:**
    - making reliability a core issue for discussion at monthly management meetings in each distribution area;
    - where possible and feasible, outages should be planned for half a day instead of a whole day;
    - live-line working techniques, where appropriate, alongside strict adherence to the highest levels of safety practices; and
    - setting performance targets for each area, and increasing supervisory and operational staff awareness of the real financial cost of customer interruptions and lost service hours.

- To employ a Direct Revenue Adjustment mechanism for the "Number of Customer Interruptions per month" (Interruptions Incentive Scheme) in instances where T&TEC fails to meet the target of three interruptions per month by feeder. The total incentive payment to T&TEC for this mechanism is capped at $7.5 million during the relevant year, and the total penalty for this mechanism is capped at $10 million during the relevant year. This mechanism is to commence from the third year of the control period, thereby giving enough time for T&TEC to put systems in place (inclusive of an appropriate system to facilitate the submission of quarterly reports to the RIC). The RIC will adjust T&TEC's allowed revenue yearly before setting/approving T&TEC's tariffs for each subsequent year. However, the RIC will consider what, if any, penalty may be directed to finance improvement projects on the worst performing feeders. T&TEC is required to conduct a Study within 18 months of the publication of the Final Determination evaluating its performance on its worst-performing feeders and the actions and resources needed to improve performance. Along with submission of the results of the Study, T&TEC will be required to submit and to action, no later than eighteen (18) months after the publication of the Final Determination, a management plan detailing the main factors that contribute to the performance on these feeders, the specific measures and resources required to improve performance, and the plan of action for T&TEC to meet the incentive target.

- The project of establishing Call Centre Metrics for T&TEC, to be completed in 2023 and metrics implemented by the second year of PRE2.
- The RIC will conduct a Customer Satisfaction Survey at the start of PRE2, to be completed by the end of the second quarter 2024.
- Implement the following revised System Losses Incentive Mechanism:
  - Calculate **Total System Losses** as: $\mathbf{1 -} \left\{ \frac{\textbf{Energy Units Billed}}{\textbf{Energy Units Purchased}} \right\}$
  - Set the base value of total system losses for PRE2, annually, as the average monthly value computed over the preceding year. The RIC to set a target for an annual reduction in total system losses over the control period at 0.15% or 15 basis points (i.e. the rate of 3/20th of a percentage point of the computed base value);
  - T&TEC to share in the gains at the end of the regulatory control period, if total system losses fall at a rate which exceeds the set annual reduction rate. T&TEC will be allowed to retain 90% of the gains and 10% will be passed on to customers;
  - T&TEC to identify the scheduled capital projects to reduce system losses which may entail:
    - The installation of appropriate metering/monitoring equipment at strategic locations of its network; and
    - Network modification to reduce the level of total system losses, which include but are not limited to shortening the lengths of long distribution lines and the installation of capacitors on feeders, after appropriate cost-benefit justification.

    The execution of these projects is to be given high priority during PRE2.
  - The RIC will take into account the value of loss-reduction equipment in the asset base when it is rolled forward to encourage investment in loss-reduction

equipment. The full cost incurred would be incorporated into the asset base if the annual target for actual total system losses is achieved, and the cost will be prorated for the partial achievement of the target. However, if the total system losses increase above the initial and successive values calculated by the RIC, T&TEC will be penalised, at the discretion of the RIC, by not having the value of installed loss reduction equipment included in the asset base, and a directive will be issued to institute loss reduction measures at no cost to customers in the following control period;

  - T&TEC must report annually to the RIC on all the proposed initiatives taken to reduce losses beyond the investment in its capital programme; and
  - T&TEC to have the loss reduction programme document and the annual reports verified by the "Reporter", the independent consulting expert.

  T&TEC will be required to submit to the RIC, no later than 10 months after the publication of the Final Determination, a loss reduction programme detailing the measurement of the total system losses in terms of the technical losses on the Transmission, Sub-transmission and Distribution networks and the non-technical losses, the forecasted trajectory in the total system losses from the second year to the final year of PRE2, <u>without</u> the intervention of the loss reduction programme, and the proposed projects/initiatives to reduce the annually computed base values by the set annual rate of 0.15% or 15 basis points. The implementation of the loss reduction programme shall commence from the start of the second year of PRE2. T&TEC must report annually, commencing from the end of the second year of PRE2, on its performance to reduce the total system losses detailing the components of the technical losses, report on any adjustment in the forecasted trajectory based on relevant developments in the preceding year, and report on the loss reduction activities undertaken in the year of review.

- T&TEC will submit Regulatory Accounts and will:
  - Place approved regulatory accounts on its website and make hard copies available on request;
  - Publish a condensed version of the regulatory accounts in a daily newspaper;

  - Submit quarterly information in the format of the regulatory accounting guidelines (RAGs), and full-year regulatory accounts to the RIC by the end of the third month of each year within the regulatory control period. The full-year regulatory accounts must be reconciled with the quarterly submissions, as necessary. The RIC considers this to be an appropriate time frame, as undue delays in publication would negate the benefits or, at minimum, reduce its immediate significance. The RIC also requires that the regulatory accounting information be submitted in electronic format;
  - Provide a responsibility statement, signed and dated by a designated senior officer of the service provider, confirming that the information submitted is accurate and properly reflects its activities; and
  - Provide an independent assurance, as required by the RIC, on information submitted. In this regard, the RIC will specify the required scope of any audit or other form of independent assurance. The audit must be undertaken by an independent expert nominated and paid for by the service provider but approved by the RIC.
- To continue to monitor the performance of T&TEC using the relevant performance indicators and T&TEC is to continue to supply all relevant information needed for this.
- The RIC will review and modify the templates used to collect data from T&TEC to ensure greater relevance in the data reported.
- To require T&TEC to employ an independent expert to review its data collection and dissemination process, and to verify that the data and computations used to derive the values of the indicators are both valid and reliable. The report should be submitted to the RIC by the third year of PRE2.
- T&TEC report on an abbreviated list of major indicators annually to give a snapshot of the performance and financial health of the service provider. The indicators to include Total System Losses (Transmission & Distribution), Current Ratio, System Average Interruption Frequency Index (SAIFI), Customers per Employee Ratio and Written Complaints Response Rate (to be known as “traffic signal” indicators).
- T&TEC to include the above “traffic signal” indicators in the electricity bills of customers once annually.

i) Miscellaneous and Other Regulated Charges (Chapter 10)

Chapter 10 discusses miscellaneous and other regulated charges. Regulated services comprise electricity sales, miscellaneous services and incidental charges. Miscellaneous charges include: disconnection/reconnection, meter installation and repositioning, visits for non-payments, repositioning of secondaries, and meter checks at the customer's request. Incidental charges include: service deposits, late payment fees, and capital contribution. Unregulated services include: the rental of poles and transformers, high voltage (HV) isolation, temporary supply, and installation/removal of pennants and banners. The RIC's decisions are as follows:

- There will be no automatic adjustment to the list of current services or charges. The RIC's view remains that the list of miscellaneous services and their corresponding charges should be reviewed periodically.
- The new charges to apply to the current list of Miscellaneous Services for PRE2 are as shown in Table ES3.
- T&TEC must submit a detailed breakdown of the typical costs to provide the miscellaneous services that are on the current list, by the end of the second year of PRE2. At the same time, T&TEC must submit a customer impact analysis and must have regard to the impact of any changes on vulnerable/low-income groups, and ensure that customer impacts are not unreasonable. The information will be assessed to determine whether new charges for miscellaneous services are to be applied from the mid-point of PRE2. Changes to miscellaneous charges within PRE2 would only occur on evidence that existing prices do not cover the reasonable costs associated with that particular service, and after approval by the RIC. The RIC will utilise the following formula: Miscellaneous Charge = Base Cost + Direct Material Cost, where: - Base Cost is a portion of Business Unit Overheads (to be determined by the RIC in conjunction with T&TEC); and - Direct Material Cost is the cost of materials used.
- T&TEC must provide a free meter check every four (4) years instead of every five (5) years to customers. Where the customer makes another request for a meter check within the four-year period, the current policy of the payment of the relevant fee will remain intact.
- The current Service Deposit (SD) charges and the conditions attached to these will remain in effect until such time as all implementation issues for the new SD charges are

resolved, inclusive of the return of these SDs. The RIC agrees in principle that the SD for new residential and commercial B1 customers will be \$234.30 and \$797.16, respectively. This represents the value of one month's average bill at the new rates using an average monthly kWh consumption of 627 kWh and 1,361 kWh, respectively. The SD charge for B2 customers (formerly B1), in principle, will be \$3,385.00, which represents, the minimum bill of 5,000 kWh. The SD charge for industrial customers, in principle, will be the value of one month's average bill (the higher of 75% reserve capacity or minimum kVA consumption). Further, T&TEC is to make an appropriate recommendation for the value of the SD for High Density Customers within one month of the publication of the RIC's Final Determination. Once the SD has been approved by the RIC for High Density Customers, it is to be retained by T&TEC until the account is closed. The new charges for SDs will become effective on date(s) to be determined by the RIC.

- The late payment fee of 1.5% per month or part thereof will remain in effect and the current conditions related to imposing the late payment fee will continue to apply.
- The Capital Contribution Policy (CCP) (2022) is to be rolled out in phases in agreement with the RIC and the RIC will monitor implementation during PRE2.
- HV isolation, temporary supply and transformer rentals will be regulated going forward and T&TEC will continue to apply the existing charges for these services as detailed in Table ES4. T&TEC must submit a detailed breakdown of the typical costs to provide these services by the end of the second year of PRE2. This information will form the basis upon which the RIC may determine new charges to be applied by the mid-point of PRE2. Pole rentals and installation/removal of pennants and banners will remain unregulated.

j) <u>Revenue Requirement (Chapter 11)</u>

Chapter 11 discusses the forecast revenue requirement. The RIC utilised the building-block approach to calculate the cost items and allowances for PRE2 and the chapter combines the individual building-block components. The RIC's decisions include:

- The annual revenue requirements for PRE2, 2023–2027 are as detailed in Table ES1.

- Adopting the net present value (NPV) smoothing approach as it allows the service provider to fully recover its revenue requirements, and minimises price volatility for customers.

k) Establishing Price Controls (Chapter 12)

This chapter sets out the issues related to the design and structure of tariffs. It also discusses how the service provider's revenue is allocated to recover costs from each end-user category. Finally, it presents the starting tariffs (base tariffs) for the first year of PRE2 and their impact on customer bills, T&TEC's financial viability and the wider economy. The RIC's decisions include:

- To use the revenue allocation as outlined in Table ES13.

Table ES 13: Revenue Allocation by Class of Customer

	2023	2024	2025	2026	2027
Residential (45.40%)					
Allocation ($Million)	**2,222.01**	**2,356.27**	**2,498.64**	**2,649.60**	**2,809.69**
Customers (No.)	464,148	471,141	478,134	485,127	492,120
Consumption (kWh '000)	3,257,000	3,308,000	3,358,000	3,408,000	3,458,000
Commercial (11.40%)					
Allocation ($Million)	**557.86**	**591.56**	**627.30**	**665.20**	**705.39**
Customers (No.)	56,801	57,171	57,667	58,689	59,702
Consumption (kWh '000)	952,000	955,000	959,000	963,000	966,000
Industrial (37.85%)					
Allocation ($Million)	**1,851.94**	**1,963.83**	**2,082.48**	**2,208.30**	**2,341.73**
Customers (No.)	4,018	4,086	4,154	4,221	4,289
Consumption (kWh '000)	4,164,000	4,404,000	4,439,000	4,478,000	4,519,000
Street Lighting (5.35%)					
Allocation ($Million)	**262.02**	**277.85**	**294.64**	**312.44**	**331.31**
Consumption (kWh '000)	136,000	138,000	141,000	143,000	146,000
Total Revenue Requirement ($Million)	**4,893.83**	**5,189.51**	**5,503.06**	**5,835.54**	**6,188.12**

- To incorporate a rebalancing control (side constraint) as part of PRE2 to provide price stability.

- The process for the annual tariff approval will be as outlined in Section 5 (vi) of the Executive Summary. T&TEC must also produce a report, on an annual basis, explaining how the tariffs have been implemented. This report must be submitted one month after the end of the regulatory year, and must provide information on whether the RIC's recommendations/directives made at the time of the annual tariff reviews have been implemented, and reasons must be given for any non-implementation thereof.
- T&TEC must submit its plan outlining its approach to educating the public about energy conservation, including specific measures/initiatives to promote efficiency and conservation, within six months of the publication of the Final Determination.
- T&TEC is required to undertake and complete a comprehensive study on the feasibility of implementing time of use (TOU) rates and provide the RIC with a report on its findings within 24 months of the publication of the Final Determination. The RIC also reserves the right to require T&TEC to make appropriate proposals for TOU rates in due course. Such proposals, if and when required, should provide sound rationale and justification, clearly indicating which classes of customers are being considered for TOU, whether the TOU rates are optional or not and specifying the number and duration of the price-differentiated periods.
- With respect to electric vehicles (EVs):
    - where customers own a private fleet of EVs (more than two (2) EVs) a separate meter must be installed, and the customer bears the associated costs.
    - all non-residential charging stations are to be billed at commercial (which do not carry a demand charge) or higher rates depending on the rating category applicable to that customer.
- The RIC reserves the right to introduce a fuel adjustment mechanism, and will issue same for public comment before implementation.
- The tiers for residential customers will be as shown in Table ES2.
- There will be a new customer rate class for High Density or High Load Factor industrial customers. These customers operate high-density technological businesses such as, server farms and data or cryptocurrency mining facilities. T&TEC will enter into a supply contract with these customers and generally, the supply will be via Overhead Lines/Underground Cables at 12,000, 33,000 or 66,000 volts ± 6%, 3 phase, 4 wire, 60

Hertz. For the purpose of capital contribution, the RIC's 2022 Policy will apply, and this class will be treated as industrial customers.

- Commercial Rate B and B1 customers will be reclassified as B1 and B2, respectively.
- The RIC's decision is that all T&TEC customers are to be billed monthly, effective from the publication of the Final Determination. However, T&TEC will determine the specific dates for the transitioning of the billing cycle and advise customers accordingly. **The RIC, in order to encourage customers to migrate to e-billing, requires that T&TEC, at the time of the first Annual Tariff Adjustment, submit a cost-based proposal for a differential customer charge for those customers who choose to receive a paper bill.** T&TEC must also provide a proposal within two months of the publication of the Final Determination for minimum bills for each rate category, which must be cost justified. In the interim, the current minimum bills will continue to apply.
- The tariff structure and charges for 2023 will be as detailed in Table ES2.

l) <u>Concluding Remarks and Way Forward (Chapter13)</u>

This chapter presents concluding remarks and the way forward. T&TEC must take note that the decisions within the Final Determination must be integrated within its operational and financial plans to ensure that they are implemented. The RIC's pricing decisions must be viewed as a comprehensive package of service quality improvements for customers premised on the approved price limits and not simply as an adjustment to tariffs. Consequently, the RIC intends to pay close attention to T&TEC's implementation of RIC's allowed Capex programme, and its efforts towards cost containment during PRE 2. The RIC's decisions are as follows:

- T&TEC must promote openness and facilitate public knowledge about, and participation in, its core activities by: making information and documentation available on its website; making the website more interactive and putting a more human face to the website, including contact details for key personnel (e.g. e-mail, telephone); and including a prominent section on its website to highlight its planning and development activities (on-going and completed), which must be periodically updated (annually).
- T&TEC must produce quarterly revenue and expenditure statements in accordance with the regulatory accounting guidelines established by the RIC and make these statements widely accessible on its website, and to the media.

- T&TEC must provide information on its website about the number of complaints and their effectiveness in dealing with those complaints.
- T&TEC must demonstrate that it has engaged with its customers prior to the submission of any Business Plan, and that due regard has been given to the views that customers expressed during this process.
- T&TEC must provide information on its website about its procurement process to allow customers access to its procurement processes that are underway, completed, or pending approval, including information such as requirements for submitting bids, important dates, and the amounts bid by tenderers.
- T&TEC must collect more systematic data on public viewpoints through its customer service centres to enable better understanding of the experiences and expectations of those who have complained and to ascertain how their concerns were addressed.
- T&TEC must publish its performance against all customer service targets, on its website[7], and produce a half-yearly overview report for the public with commentary on where and why this performance has not met the targets. Reports on these findings should be submitted to the RIC on an annual basis.
- T&TEC must disclose information about how many complaints it receives and resolves annually, and publish data on its performance with respect to quality of service and its operations.
- T&TEC must utilise independent researchers, approved by the RIC, to undertake more generalised surveys regarding customers' experience with utility services, either before the end of the regulatory control period or at least every five years. The results of this survey must be included in its Business Plan submission for the next regulatory control period.

[7] These reports can also be shared on social media.

1 INTRODUCTION

1.1 BACKGROUND

The Regulated Industries Commission (RIC) is charged with the legal responsibility and authority for conducting periodic reviews to set the maximum rates and charges for the electricity, and water and wastewater sectors for each regulatory control period. A regulatory control period is the period between price reviews, during which time the price regulation methodology utilised in setting tariffs is held constant. Sections 6, 47, 48 and 67 of the RIC Act, Chapter 54:73, specify the price regulation framework to be observed by the RIC when setting prices.

The price regulation for the first regulatory control period for the Trinidad and Tobago Electricity Commission (T&TEC), which spanned the period June 1, 2006 to May 31, 2011 (PRE1), established the foundation for the economic regulation of the sector. This second review and the price regulation methodology to apply from November 1, 2023 until October 31, 2028 will be known as the second regulatory control period for the Regulation of Electricity Transmission and Distribution (PRE2). In broad terms, our objectives remain consistent with the objectives of the PRE1, that is to support the financial viability and meet the new investment requirements of the service provider, while incentivising efficiency improvements. The rationale for the RIC's final decisions is explored in detail in the remainder of this document.

1.2 CONTEXT AND OBJECTIVES OF THE SECOND REVIEW

It is important to understand the context for this review, especially the legal requirements the RIC must comply with in conducting price reviews. Section 48 of the RIC Act, in particular, mandates that the RIC reviews the principles for determining rates and charges for services every five years. In accordance with this responsibility, the RIC is conducting this review to determine the appropriate revenues and prices for PRE2. The RIC is also required to take account of a wide range of factors in making its decisions, and to balance the needs and interests of different stakeholders affected by these decisions.

The review of rates and charges for T&TEC is occurring at a very challenging time. On the one hand, the world faces the task of mitigating the effects of climate change, while on the other hand the global economy is struggling to cope with volatile energy prices and supply chain disruptions. In respect of worsening climate issues, conservation of electricity and implementation of energy efficiency measures can assist in reversing this trend.

Trinidad and Tobago, as a net exporter of energy products, has been better placed to cushion some of the impacts discussed above. According to the Review of the Economy 2022, "the country has been learning to live with the COVID-19 virus, the Trinidad and Tobago economy is now on a path to recovery and growth, amidst concerted efforts towards rebuilding what was detracted by the pandemic." Indeed, the economy grew by 1.5 percent in 2022, reversing a 1 percent decline in 2021[8]. This does not mean however, that some citizens have not had challenges to meet their monthly household expenditure. These are the major circumstances that the RIC has had to navigate while conducting its review. Among its main responsibilities the RIC must ensure that electricity prices are affordable, and that T&TEC has the funding necessary to provide reliable and quality services to the public. The challenge for the regulator is how to set prices that would allow T&TEC to provide reliable services and still make these services affordable to citizens.

PRE2 follows almost 12 years after PRE1, and in the intervening years the financial circumstances of T&TEC deteriorated to the extent that they were unable to meet some of their commitments. Therefore, the completion of this review and the implementation of the new rates should have a positive effect on the overall operations of T&TEC, thereby leading to improved services to customers.

The purpose of the Price Review is to determine an appropriate level of allowed revenue for T&TEC and the quantum and structure of tariffs that will be paid by customers for PRE2. In setting the allowed revenue for PRE2 and starting tariffs for 2023, the RIC's objectives are to ensure that:

[8] See "Review of the Economy 2023", published by Ministry of Finance, Trinidad and Tobago, 2023.

- the service provider operating under prudent and efficient management can earn sufficient return to finance necessary investment. In doing so, the RIC wants to ensure that the service provider's planned investments are necessary and provide value for money for customers;
- the interests of customers are protected, in the short and long term, by ensuring that services are reliable and provided at the lowest possible cost; and
- appropriate incentives are provided for the service provider to improve its efficiency where possible, and that most of these savings that result from efficiency gains are passed through to customers.

Stakeholder Comments

Subsequent to the publication of the Draft Determination, many respondents raised concerns related to the timing of the Price Review, the RIC's failure to conduct reviews in a timely manner, and some questioned the independence of the RIC, claiming that the line Minister for the RIC had made statements publicly that could be interpreted to mean that he might have been directing the price review process. The RIC understands these concerns and would like to address them as follows:

- **Timing of the Price Review** – The RIC is cognisant of the impact of COVID-19, the current economic climate, and the hardships these circumstances place on the population. The RIC understands that the conduct of a price review elicits unfavourable responses from the public and has sought to cushion the impact of increases on customers.
- **Failure to conduct timely Price Reviews** – The RIC acknowledges that, ideally, PRE2 should have followed immediately after PRE1. The first attempt to complete PRE2 commenced in 2010 but a series of events caused this process to be aborted. In 2019, changes at the Board level and the price review process recommenced in December 2020 with a request to T&TEC to submit its Business Plan. T&TEC eventually submitted its Business Plan in November 2021.
- **Independence of the RIC** – Independence does not mean that the RIC is not accountable to other bodies. The RIC's line Ministry is the Ministry of Public Utilities (MPU). Section 23 (4) of the RIC Act requires certified copies of Board Minutes of the RIC to be forwarded to the Minister. Through this medium, the Minister is fully apprised

of all the activities undertaken by the RIC, including price reviews. This legislative requirement does not compromise the independence of the RIC, as the Ministry does not direct the RIC's work plan nor any of its operational activities.

1.3 REVIEW AND CONSULTATION PROCESS

The RIC reviewed its price regulation methodology and all other issues considered in PRE1 prior to the commencement of PRE2. When reviewing the principles for determining rates and charges for services, Section 6(2) of the Act requires the RIC … **"**to consult with service providers and representatives of consumer interest groups and any other parties it considers as having an interest in the matters before it." The RIC engaged in wide-ranging discussion of the issues prior to establishing the principles and methodologies to be used in regulating prices in PRE2.[9]

The process involved the publication of the twenty (20) technical papers on its website and listed in Box 1.1. The public was invited to respond to specific questions and give general views on the material presented. These papers were also distributed to organisations and individuals with an interest in the area of consultation. The views and suggestions garnered in response to our consultation were analysed and used as part of the decision-making process. The comments received and RIC's responses to these were included in the Draft Determination.

To facilitate communication between the RIC and stakeholders, the RIC established a dedicated area on its website[10] for T&TEC's Price Review. Stakeholders were able to view copies of all consultative documents, updates on the progress of the review, and information on how to participate in the review, and responses to legal questions.

The high-level activities associated with this review were:

- **Preparation of the paper, "Information Requirements: Business Plan 2021–2026"**
- **Submission and Analysis of Business Plan**
- **Formal Review Process.**

[9] See the RIC's "Guidelines for the Public Consultation Process of the Regulated Industries Commission" document.
[10] Documents are still accessible on the website: www.ric.org.tt

The RIC **released and posted** on its website for public scrutiny, its Consultative Document, “**Information Requirements: Business Plan 2021–2026”** in December 2020**.** The document provided guidance to the service provider on the preparation of its price review submission so that the submission and any other information requested would be provided in a consistent format.

The **Information Requirements: Business Plan** detailed the information requirements needed to conduct a price review. The service provider was required to:

- specify its strategy for the future.
- submit its proposed objectives, expenditure needs, financing requirements and implications for bills, etc.
- explain and justify its strategy, associated assumptions and its priorities.

Submission and Analysis of Business Plan

T&TEC submitted its Draft Business Plan on November 26, 2021. After reviewing the document, the RIC had several meetings with T&TEC to further understand some of its proposed strategies and projects. Following these meetings, additional data and information were provided, and a Final Business Plan was submitted on June 24, 2022.

Formal Review Process

Concomitant with the release of the **“Information Requirements: Business Plan 2021–2026”** document the RIC released its document **“Framework and Approach: Second Regulatory Control Period.** That document outlined the RIC’s overall process and approach to the Price Review, the work plan, major issues that the review will consider and the issues that will have to be resolved in implementing the tariffs. Thereafter, the RIC issued a series of Consultative and Information Papers. Prior to the release of the Draft Determination, and in accordance with, Section 6 (2) of the RIC Act, the RIC communicated with T&TEC’s shareholder, the Government of Trinidad and Tobago, which is a key stakeholder, and whose public policy decisions must be followed by the RIC and T&TEC. Following a press conference on December 29, 2022, the Draft Determination was published on January 6, 2023, and public notified through advertisements in the three (3) daily newspapers, through the RIC’s social media pages, and emails were sent to stakeholders on RIC's mailing list. The public was also informed that face-to-face consultations would commence on January 12, 2023.

The RIC held fifteen (15) public consultations throughout the country to discuss the Draft Determination, meetings with twenty-four (24) special interest groups, one of which was held virtually, and engaged in a number of media appearances during the period January 12 to March 31, 2023. All fifteen (15) of its face-to-face public consultation meetings were streamed live via the RIC's Facebook page (**Box 1.1 briefly highlights the RIC's review process**). The RIC's Stakeholder Response Document details the RIC's responses to the comments received during the consultation process. In the Final Determination the RIC adjusted its position where appropriate, based on comments it received, inclusive of those received from T&TEC. The Final Determination also takes cognisance of existing Government policies. **Annex 1** lists the organisations/individuals that submitted written comments and attended the public consultations at various locations (it also includes the number of online views for each of the public consultations).

Box 1.1: RIC's Review Process

1. Released the paper, "Information Requirements: Business Plan 2021–2026, requiring T&TEC to provide a submission detailing its pricing proposal together with financial and performance data on the future capital and operating expenditure necessary to maintain customer service levels.
2. Released a consultative paper "Framework and Approach: Second Regulatory Control Period", which outlined the RIC's overall process and approach to the price review, the work plan, the major issues that the review will consider and the issues that will have to be resolved in implementing tariffs.
3. Released the following Consultative and Information papers for public comments:
   - Stakeholder Involvement in Regulatory Decision-Making – January 2021
   - Review of the Status of the Trinidad and Tobago Electricity Commission – June 2021
   - Establishing an Appropriate Form of Price Control – January 2021
   - Determining the Length of the Regulatory Control Period – January 2021
   - The Treatment of Input Price Inflation in Price Control Reviews – January 2021

Box 1.1: RIC's Review Process Cont'd

- Annual Price Adjustments – Are they a necessary feature of Incentive Regulation? – January 2021
- Po Adjustment - Passing Cost Savings to Customers – January 2021
- Treatment of Pension Costs for Regulatory Decision-Making – February 2021
- Approach to Setting Operating Expenditure – March 2022
- Approach to Assessing Capital Expenditure for Price Reviews – May 2021
- Embedding Financial Viability and Sustainability – February 2021
- Review of Performance Monitoring and Reporting – January 2021
- Addressing the Affordability of Regulatory Prices – January 2021
- Regulating Quality of Service – Service Incentive Mechanism – January 2021
- Incentive Mechanism for Managing System Losses – January 2021
- Principles of Rate Design and Tariff Structures – March 2022
- The Importance of Conducting Timely Price Reviews – January 2021
- Improving Transparency and Accountability in the Electricity and Water Sectors – February 2021.

4. Input from Shareholder (Government) on various issues.
5. Released the Draft Determination for public comment.
6. Held Public Consultation/Stakeholder Meetings on the Draft Determination Document (See Annex 1).
7. Published Stakeholder Response Document on Draft Determination and Final Determination.

1.4 RIC'S ANALYTICAL APPROACH TO SETTING PRICE LIMITS

There are numerous complex and conflicting requirements that must be considered when determining price limits for the control period. The analytical steps followed by the RIC are outlined in **Figure 1.1** below and discussed in detail in the document.

Figure 1.1: RIC's Analytical Approach for Setting Price Limits

Regulatory Framework & Theoretical Issues

- Methods & Forms of Regulation
- Methodology for determining Revenue
- Length of the Regulatory Period
- Dealing with Uncertainties

Performance of the Service Providers

- Characteristics and performance of the service provider
- Supply and demand situation

Standards & Incentive Mechanisms

- Incentive mechanisms to achieve efficiency gains
- Incentives to achieve higher standards
- Compliance monitoring and reporting

Assessing Revenue Requirement

- Assessing efficient operating expenditure
- Assessing reasonable & efficient capital expenditure
- Assessing initial regulatory asset base
- Rolling-forward of asset base
- Assessing cost of capital
- Estimating depreciation
- Assessing financeability of service provider

Establishing Price Controls

- Demand management options
- Structure and level of prices to achieve sustainability and economic efficiency objectives
- Spreading costs of delivering services amongst customer groups
- Cross Subsidisation

Impact of Price Controls

- Analysis of impact of price controls on:
  - Different groups of customers
  - Country Competitiveness
  - Impact on household expenditure and welfare
  - On-going viability of the service provider
  - Environment

1.5 STRUCTURE OF THE DOCUMENT

The remainder of this document is structured as follows:

- **Chapter 2** details the RIC's tariff setting approach, including the legal requirements, structure of the price control, approach to determining revenue requirements, and dealing with uncertainty;
- **Chapter 3** provides information on how the service provider's Regulatory Asset Base (RAB) has been derived for PRE2;
- **Chapter 4** provides information on the cost of capital for application to the RAB over PRE2;
- **Chapter 5** provides data on the forecasts of Electricity Demand and Customer Numbers;
- **Chapter 6** provides an overview of the historical performance of the service provider in the areas of finance and operations since PRE1;
- **Chapter 7** outlines a review of T&TEC's historical operational expenditure and performance during PRE1, T&TEC's forecast operational expenditure for PRE2 and the RIC decisions on the revenue required for operating expenditure in PRE2;
- **Chapter 8** outlines a review of T&TEC's historical capital expenditure during PRE1, T&TEC's forecast capital expenditure for PRE2 and the decisions on the revenue required for capital expenditure in PRE2;
- **Chapter 9** provides information on incentives and performance monitoring for PRE2;
- **Chapter 10** provides information on miscellaneous services and charging principles;
- **Chapter 11** provides information on how the decisions outlined within the previous chapters feed into the allowances for a return on assets, depreciation and the revenue that would be collected each year during PRE2, including the forecast of energy sales the RIC used in calculating tariffs;
- **Chapter 12** provides information on tariffs for PRE2 and on the manner in which T&TEC collects its revenue from its customers, as well as discusses the implications of the RIC's decisions on stakeholders; and
- **Chapter 13** provides concluding remarks.

2 RIC'S TARIFF SETTING APPROACH

2.1 INTRODUCTION

Regulation plays an important role in protecting customers' interests and promoting efficiency. T&TEC is the monopoly provider of transmission and distribution services in the electricity sector, and regulation acts as a proxy for competition. PRE2 establishes the overall regulatory framework, including the financial framework within which T&TEC can operate, and provides the incentives for it to deliver and outperform the RIC's determination.

This chapter discusses some of the key elements of the RIC's regulatory process. Many of these elements are similar to those employed by other well-established regulators. The first issue considered in setting price controls for PRE2 was the price/tariff-setting approach that the RIC would utilise. The price/tariff-setting approach broadly comprises the rules and methodologies to determine, monitor and adjust prices over the control period. The RIC reviewed the decisions included in its determination for PRE1 as its starting point and augmented this approach for PRE2 to reflect any changes in the RIC's thinking and developments in the regulatory environment. The main elements considered include:

- the legal requirements/mandate under the Act;
- the overall structure of the price control;
- the length of the control period;
- the method for determining revenue requirements;
- a mechanism to provide enhanced incentives to pursue efficiency gains during the control period;
- the setting of rules for updating the revenue control for observable but unpredictable factors (e.g. inflation);
- the setting of adjustment rules that explain how the revenue control may be adjusted during the control period or at the next review period in the light of unforeseen events (e.g. if costs begin to differ materially from set forecasts); and
- the reporting requirements for the service provider.

The sections below and other chapters of this document set out the RIC's position on each of the above elements.

2.2 LEGAL REQUIREMENT

The RIC must take account of a wide range of factors in making its decisions in order to balance the competing needs and interests of different parties affected by those decisions. The RIC has three overarching functions/responsibilities as contained in its Act:

- **financial viability and sustainability of the service providers**, that is, to ensure that the service providers can carry out and finance their operations and that they have sufficient revenue to afford them an opportunity to earn a reasonable return on their used and useful assets;
- **economic efficiency**, that is, to encourage greater efficiency in the use and supply of services; and
- **protecting customer interests**, that is, to ensure that there is equity and fairness, and that lower-income and vulnerable groups are protected, that the social impact of decisions is considered, and that the quality and reliability of the services are maintained.

The RIC achieves the above objectives by undertaking price reviews. At the conclusion of a price review, the RIC sets price limits on rates which allow the service providers to deliver, at the lowest overall reasonable cost, the expected quality of service and other customer service objectives. The RIC aims to ensure that customers receive the best possible value for money by scrutinising all costs (i.e. capital and operating), to ensure that they represent the lowest reasonable overall costs before translating them into tariffs.

The principles of rate design the RIC adheres to are that:

- customers pay their fair share for the services they receive;
- the tariffs, in general, should be cost-reflective;
- the maximum tariffs are affordable, stable and increase by no more than inflation; and
- tariffs for each class of customer should remain harmonised across the country.

Sections 6 and 67 of the RIC Act require the RIC to have regard to:

- the funding and ability of the service provider to perform its functions;
- the ability of the consumer to pay rates;
- the results of studies of economy and efficiency;
- the standards of service being offered by the service provider;
- the rate of inflation in the economy for any preceding periods as may be considered appropriate; and
- future prospective increases in productivity by the service providers.

The RIC uses judgement in determining how to balance these competing interests as its Act does not specify how the RIC is to take account of these factors or provide guidance on which factors should prevail. While the RIC understands the need to ensure that prices are cost-reflective as far as possible, it may deviate from this objective to mitigate the impacts on customers.

2.3 FORM OF THE PRICE CONTROL

The most fundamental aspect of setting a price control/limit is deciding on the form of that control. The form of the price control refers to the high-level structure for setting price limits and involves a number of different elements, such as:

- **the length of the control period**, that is, how often the price limits are reviewed and if there are annual limits within the regulatory control period;
- **what is controlled and how that is achieved**, that is, whether it is a price or revenue control and whether the control applies to a basket of services, or to the prices of individual services; and
- **the link between price and outputs**, that is, the efficiency retention mechanisms used.

The RIC has substantially retained the overall framework/model used in PRE1, where circumstances are comparable, and has sought consistency between the form of price control used in PRE1 and PRE2, while considering some new issues.

With respect to the form of the price control the following documents were released:

- Determining the Length of the Regulatory Control Period
- Establishing an Appropriate Form of Price Control
- P_0 Adjustment – Passing Cost Savings to Customers
- Annual Price Adjustments – Are they a necessary feature of Incentive Regulation?
- The Treatment of Input Price Inflation in Price Control Reviews.

The overall form of price control used for PRE2 is briefly discussed below.

2.4 STRUCTURE OF THE PRICE CONTROL

2.4.1 Incentive Regulation

The RIC applied an incentive regulation regime, based on the RPI-X model, in which efficiencies are built into the Opex and Capex allowances and the resulting revenue is profiled over the period.

In its most general form, the RPI-X approach involves limiting price/revenue changes to general inflation less a specified "X"- factor. The X-factor is used is to reflect the expected change in productivity of the regulated service provider over and above the expected change in RPI.[11] Price cap/incentive regulation is characterised by several key factors, of which the best known are:

- A cap on tariffs, average prices or total revenues;
- A formula for updating the cap on tariffs (average prices or total revenues) from year-to-year (e.g. RPI-X formula), so that the cap develops independently of actual costs; and
- A pre-specified regulatory period, at the end of which the formula is reviewed.

[11] For this reason, the "X" is sometimes referred to as the "productivity offset".

RPI-X regulation is intended to provide strong incentives for efficiency, as any savings above the predicted rate "X" can be kept by the service provider. It is, therefore, in the interest of the service provider to outperform the "X" as it can increase the rate of return that it earns.

In its simplest form, price cap regulation uses an indexing formula to determine the maximum allowable price to recover unavoidable cost increases by a utility but also requires it to lower prices regularly to reflect productivity (X-factor), during a defined period. The X-factor is set at the time of the determination for the duration of the regulatory control period. In the determination of the X-factor, several relevant factors are considered, such as demand, costs and underlying efficiency. A basic price cap formula is shown in **Box 2.1** below.

Box 2.1 - Basic Price Control Formula

$$P_t = P_{t-1}[1 + I - X] \pm Z \pm K$$

Where:

P_t = maximum price in year t

P_{t-1} = the maximum price in previous year t-1

I = inflation index

X = productivity or efficiency factor

Z = adjustment for unforeseen events (typically treated as "pass-through items" because these events are outside of the firm's control)

K = adjustments for under or over recovery against previous year's target

A revenue cap is similarly constructed by replacing P with R.

The RIC has utilised an *ex-ante* approach to setting price controls, as *ex-ante* rules enhance certainty, predictability and credibility of regulatory determinations. This approach involves specifying upfront performance targets/obligations to be delivered/met, and monitoring the service provider's compliance with those obligations/targets. The service provider has an incentive to achieve, at least, the efficiencies anticipated by the regulator, because if it fails to do so, it will not recover the allowed costs. At the same time, the service provider has an incentive to achieve greater efficiencies because it can earn higher profits for the remainder of the regulatory control period. The creation of incentives to reduce costs to efficient levels is one of the main aims, hence it is crucial that the service provider bears the consequences of changes in its costs so as to create these incentives. To do this, the service provider's revenue requirement, based on the efficient costs of providing services, must be determined *ex-ante* and its revenue must be "capped" in line with this revenue requirement for the control period.

Stakeholder Comments

One respondent requested a further understanding of how the X-factor is determined.

There are two main approaches to setting the value of the X-factor. The first approach relates X directly to annual inflation-adjusted reductions in aggregate costs. Under this approach, X is a proxy for efficiencies and not strictly a productivity measure. The X is based on a benchmark estimate of the trend for the annual rate of productivity (or efficiency). The X-factor can be established by considering the operational history of a service provider or alternatively, by reference to industry or economy-wide benchmarks that are independent of the service provider's costs of production. This then becomes the performance target that the service provider must equal to maintain its profitability. Performance that surpasses the target will result in higher returns during the control period for the service provider and this provides the key incentive of the RPI-X form of regulation. Generally, the productivity offset or X-factor takes into account a number of factors, including:

- the ability of the regulated firm to finance its operations;
- the capacity of the firm to lower costs without compromising quality of service;
- the future scope for productivity improvements in the regulated firm relative to productivity growth in the economy;
- a consumer productivity dividend (stretch factor) that is, a dividend to consumers resulting from the streamlining of regulation and increased incentives for efficiency under incentive regulation;
- the competitive adjustment which could be a positive or negative figure; and
- an allowance for a period of adjustment to new rates.

The second approach uses X as a smoothing device. Under this approach, expected efficiencies are separately factored into each building-block cost category and the X factor represents the value which, on average, achieves the resultant real-term change in revenues (or revenue path) that minimises price shocks. In other words, the net present value of required revenues is fully recovered over the regulatory period through the X factor, using a smoothing technique. The RIC utilises the X as a smoothing device. Full details on the X factor are provided in Chapter 11.

2.4.2 Length of the Control Period

The length of the regulatory control period is a fundamental part of the regulatory framework. It is the duration of time for which the RIC determines the service provider's revenue requirement, tariff and other price control arrangements, such as outputs and incentives. Therefore, it is of critical importance to all stakeholders. After consideration of all relevant issues, the RIC settled for the continued use of a five-year price control period as it strikes an appropriate balance between risk and the ability to undertake cost savings.

The RIC sets five-year price limits in accordance with the provisions of its Act. A cornerstone of incentive regulation is that the length of the control period must be long enough for the service provider to implement initiatives to reduce cost and enjoy the resulting profits for a reasonable length of time. If this were not the case, the service provider would have no incentive to reduce costs since gains would be immediately returned to customers. The price limits reflect the maximum the service provider is allowed to charge to provide services and deliver its obligations to customers. In essence, the prices limit the quantum of revenue the service provider can raise from the customers of its regulated business.

Final Decision

The RIC received no dissenting views on its use of a five-year price control.

The RIC's decision is to utilise a five-year price control period for PRE2.

2.4.3 Revenue Cap

In PRE1, the RIC's preferred form of control had been a fixed (total) revenue cap. In its document **"Establishing an Appropriate Form of Price Control"**, published in January 2021, the RIC argued that this form of control is also the appropriate form of price control for PRE2.

A fixed or total cap provides distinct advantages such as striking an appropriate balance of risk between customers and the service provider. It also incentivises the service provider to reduce costs and make efficiency gains, and provides the service provider with the operational flexibility it needs to meet its service objectives while simultaneously exposing the service provider to risks it could control.

Under the revenue cap approach, the service provider's gross revenues are limited to a fixed amount for a defined set of services. This fixed amount (cap) is usually subject to an annual adjustment for productivity gains (called the X-factor) and inflationary effects. Periodic readjustments assist in scaling revenues appropriately to changes in the customer base of the regulated firm. The revenue cap can be expressed as:

$$R_t = (R_{t-1} + CGA * CUST) * (1 + RPI - X) \pm Z -----(i)$$
$$OR$$
$$R_t = R_{t-1}\left[(1 + (CGA * CUST) + (RPI - X)\right] \pm Z ----(ii)$$

Where:

R_t - is the authorised revenue for time *t*

RPI - is the annual change in retail prices

X - is the reduction in prices imposed by the regulator based on projected productivity gains

Z - is a variable to allow for adjustments arising out of unforeseen events (these are treated as "cost pass-throughs")

CUST - is the annual change in the number of customers (or the annual change in output)

CGA - is a customer growth factor which can be expressed in either absolute dollar terms, [equation (i)], or in percentage terms, [equation (ii)].

In PRE1 the RIC supplemented its fixed (total) revenue cap with several secondary controls including:

- A profit-sharing mechanism if profits were to exceed 10% of total revenue;

- A notional unders and overs account; and
- A side constraint on the annual increase in revenue.

In the Draft Determination the RIC indicated that it will continue to utilise the secondary controls in PRE2.

Final Decision

The RIC received no dissenting comments on the use of a fixed revenue cap.

The RIC's decision is to utilise a fixed (total) revenue cap as the appropriate form of price control for PRE2, supplemented by a profit-sharing mechanism if profits were to exceed 10% of total revenue, a notional unders and overs account, and a side constraint on annual increases in revenue as detailed in the revenue cap formula.

2.4.4 Incentive Mechanisms

A fairly well-documented drawback of standard RPI-X regulation is that it provides weak incentives for efficiency gains late in the control period because such gains would only be retained by the service provider until the end of that regulatory period. In fact, there is an incentive for the service provider to defer efficiency gains that could be made late in the determination period until the start of the next control period.

In PRE1, the RIC included an Efficiency Carryover Mechanism whereby the service provider was allowed to retain the benefits for a fixed period of five (5) years regardless of when the efficiency gains were made. This five-year rolling retention mechanism was expected to deliver the most even distribution of efficiency savings across the duration of the control period. The Efficiency Carryover Mechanism was provided for both Opex and Capex.

For Opex, the service provider was permitted to retain the annual savings, provided such savings were not made at the expense of performance and quality of service. In assessing the gains to be retained by the service provider on Capex, the RIC proposed to examine the cost, volume, necessity and quality of the investment made. For example, no benefits were to be retained if savings are made through deferring or reducing the quantum of allowed investment.

Similarly, inefficient Capex would not be allowed into the RAB at the next price control period and revenue earned on Capex not spent would generally be clawed back, except where the service provider can justify that the avoided spend was due to efficiencies achieved.

During PRE1, many efficiency improvements manifested themselves more through the delivery of better levels of service rather than as cost reductions. Thus, for PRE2, the RIC is proposing a number of additional mechanisms and tools which may be used to provide incentives and to encourage specific desirable behaviour. These include:

- stipulating minimum binding targets with upfront reduction of allowed revenue;
- an incentive to reduce the level of transmission and distribution losses;
- using specific financial incentives under the Guaranteed and Overall Standards Scheme to compensate customers;
- an incentive related to the delivery of capital projects; and
- incentives to reduce customer interruptions.

Notwithstanding the above, the RIC will continue to allow T&TEC latitude to outperform over PRE2, while maintaining focus on controlling costs.

Final Decision

The RIC received no dissenting comments on its use of an efficiency carryover mechanism.

The RIC's decision is to utilise an efficiency carryover mechanism.

2.4.5 Approach to Determining Revenue Requirements

The first step in determining price/revenue controls is to establish the allowable revenue of the service provider upon which to base a price control. The RIC used the building-block approach, a methodology widely preferred by economic regulators, to estimate maximum revenue/price controls. The revenue profile for the control period is built up from an assessment of forecasts of key cost components comprising:

- the regulatory asset base to apply to the service provider;
- a rate of return on regulatory asset base (including any forecast capital expenditure) and a return of capital (depreciation) over the regulatory period; and

- a forecast of operating, maintenance and other non-capital costs over the control period.

The RIC must ensure that price/revenue controls comply with the regulatory principles outlined in the RIC Act. Specifically, the RIC Act, Section 67, sub-sections (2) (3) and (4), mandates that price/revenue controls to be set to take into account the:

- recovery of least-cost operating expenditure;
- recovery of replacement capital cost expenditure;
- recovery of return of capital (depreciation) and return on rate base;
- funding and ability of the service provider to perform its functions;
- interest of shareholders of the service provider;
- ability of consumers to pay rates;
- standard of service being offered by the service provider; and
- incentives for the service provider to pursue efficiency improvements and to promote the sustainable use of resources.

The building-block approach ensures that the full, efficient costs of providing the regulated services are measured and monitored rigorously and transparently. The approach is consistent with the RIC Act, Section 67(4), which requires the RIC to have regard to, *inter alia*:

- replacement capital cost expended;
- least-cost operating expenses which may be incurred;
- annual depreciation; and
- return on the rate base.

The RIC's legal mandate, regulatory objectives and industry-specific context[12] make it appropriate to adopt the building-block approach to establish the price controls. Because the approach is forward-looking, it provides incentives to improve efficiency, and because it is largely based on utility-specific costs, it provides some assurance that the service provider will be able to recover reasonable costs. For these reasons, it is particularly well-suited for a State-owned and operated utility.

Final Decision

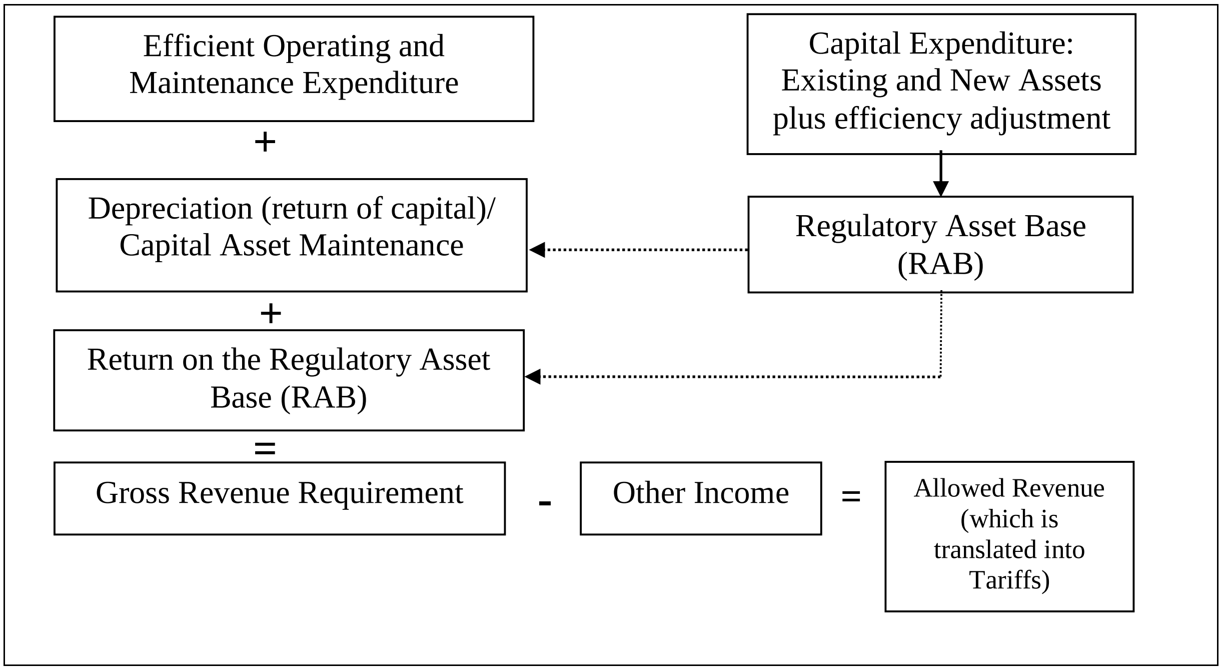
The RIC received no dissenting comments on its overall use of the building-block approach.

The RIC's decision is to utilise the building-block approach to estimate the forecast revenue requirements.

The following chart (Figure 2.1) provides an overview of the building-block approach to determining the revenue requirement.

[12] T&TEC is the sole operator in the Transmission and Distribution Sector and, as explained in later chapters, has a number of uncontrollable cost items.

Figure 2.1: Building-block Approach and Revenue Requirement



2.4.6 Dealing with Uncertainty

Ensuring that the service provider has sufficient revenue throughout the control period to maintain effective operations is a core concern of PRE2. The service provider should be able to finance its planned investment, operating and maintenance costs and meet its financing costs. As input prices are assessed prior to the finalisation of price controls for a forthcoming price control period, there will inevitably be an element of uncertainty about the evolution of input prices. Increases in costs arising from price inflation might not be recovered if they were not accounted for in the revenue requirements of the service provider. A number of mechanisms such as, adjustment clauses, ad hoc allowances, cost drivers/ triggers, re-openers, and interim determinations, can be employed to treat with the issue of input cost pressures. The RIC published the document, "**The Treatment of Input Price Inflation in Price Control Reviews"** and it discussed in detail many of these mechanisms.

As the majority of T&TEC's allowed revenue is derived from a few sizeable cost items, the RIC applied the under-mentioned approach to account for input prices and their increases for PRE1:

- Conversion and fuel costs, which constituted about 70% of T&TEC's total costs in PRE1, were treated largely as pass-through items as these are considered non-controllable input costs for T&TEC and are subject to contractual arrangements;

- Labour costs, which accounted for 50% of T&TEC's Transmission and Distribution costs, were escalated by the factors decided by the Industrial Court in T&TEC's settled wage negotiations;

- Depreciation and the return on capital were adjusted for inflation using the Retail Price Index (RPI). The RPI was best suited for this as it reflects changes in purchasing power and the value of money; and

- The remainder of T&TEC's Transmission and Distribution Costs were adjusted for inflation using the RPI (specifically the Core Index, which removes the effects of food inflation).

The RIC utilised indexation to account for changes in input prices for PRE2, and will continue to use the existing mechanisms for dealing with uncertainty.

A summary of the RIC's current regulatory framework for setting tariffs is presented in Table 2.1 below. A more detailed discussion of different elements of the tariff setting approach is presented in **Annex 2**.

Table 2.1: RIC's Current Regulatory Framework for Setting Tariffs

Area of Regulation	Main Characteristics
Setting Outputs	Largely focused on quality-of-service targets, where the service provider is held accountable for the delivery of outputs.
Setting Revenue Allowances for the Five-Year Control Period	Review of pricing principles every five years including: • modelling of investment needs over the five-year period. • forecasting of efficient operating and maintenance costs over the control period inclusive of expected productivity improvements. • developing asset life assumptions and depreciation profiles. • determining asset base (i.e. invested assets) on which return equal to cost of capital is permitted. • developing cost of capital scenarios. • benchmarking of costs with international utilities. • setting *ex-ante* targets and upfront reduction of costs.
Incentive Framework	• Setting maximum revenue allowance to reduce costs within price control period. • Rolling incentive scheme for reduction of Opex and Capex. • Specific incentive schemes (e.g. loss reduction). • Guaranteed standards scheme.
Adjustments during Price Control Period	Various measures to manage risk and uncertainty between periodic reviews, including reopeners and revenue drivers.

3 REGULATORY ASSET BASE

3.1 INTRODUCTION

One of the most important issues when determining maximum tariffs is the amount of revenue that the service provider is allowed to collect from customers so that it can provide services efficiently, and earn a reasonable return on its asset base. The regulatory asset base (RAB) is the accumulated value of the assets used in providing regulated services. The RAB plays a key role in the determination of the depreciation allowance that the service provider receives (commonly referred to as the return of capital) and is the base to which the rate of return/cost of capital is applied when determining the return on capital assets.

The initial/opening value of the RAB must be established first before rolling forward the values over the control period. The values for the forecast RAB are derived by:

- assessing the capital expenditure incurred during the current regulatory control period to decide whether it was prudent and should, therefore, be included in the opening value of the RAB for the forthcoming regulatory control period;
- assessing forecast Capex to determine whether it is efficient and prudent and should therefore be included when rolling forward the RAB;
- calculating the allowance for depreciation; and
- calculating the annual values of the RAB over the regulatory control period, considering adjustments for depreciation, inflation and expected disposals.

The forecast RAB can be expressed by the following equation:

$$RAB_t = RAB_{t-1} + Capex_t - Depreciation_t - Disposals_t$$

A number of interrelated issues must be addressed in order to determine the service provider's RAB, including:

- the methodology used to value the assets;
- the depreciation method used;
- the length of asset lives;

- the regulatory treatment of assets funded by Government and/or capital contributions and grants; and
- the regulatory treatment of additions to the RAB, that is, assets over and above allowed Capex, and claw-back of revenue earned on Capex for projects that were not undertaken.

The overall approach for the assessment and determination of each issue is discussed below.

3.2 VALUATION OF THE REGULATORY ASSET BASE

The common approaches used by regulators include:

- Acquisition/Historic Cost – Assets are valued at their original construction cost. The value of assets is neither indexed for inflation nor is its value linked to the cost of replacement.
- Replacement Cost – Assets are valued at the cost needed to replace existing assets. There are two approaches to replacement cost: indexing the acquisition cost of assets, and revaluing the asset base using a modern equivalent asset (MEA) approach.
- Deprival Value – Assets are valued at the lower of their optimised depreciated replacement cost (ODRC) or economic value (in the event they cannot be replaced).
- Replacement Cost less Stranded Assets – Assets not utilised in the current system are excluded. The remaining assets are valued at what it would cost to build a replacement system.

Each of these methods has distinct advantages and disadvantages, which are presented in Table 3.1. The selected method is based on the level of appropriateness for a particular utility and local circumstances, as different methods can result in different estimates of the RAB. Therefore, in this instance, the core issue would be whether the RAB should reflect the cost to replace the current asset (replacement value) or the cost of acquisition (acquisition cost).

Table 3.1: Advantages and Disadvantages of Different Valuation Methods

Approach	Advantages	Disadvantages
Acquisition Cost/Historic cost (Actual cost)	• Simplest of all approaches. • Requires no adjustment to RAB except new Capex and depreciation.	• Does not reflect economic value of assets. • May reduce incentives to invest. • May not provide sufficient cash flow to fund investment.
Replacement Cost: • **Modern Equivalent Asset (MEA)**	• Provides a better indication of changes in market values. • Ensures the RAB is directly linked to the cost of new assets.	• Complex, as it requires all assets to be reviewed and valued. • Controversial, as to whether valuation should reflect optimal or existing network. • Risky especially when treating stranded assets – changes in technology since the asset was constructed and different expectations of the use of the assets may cause the modern equivalent or optimised assets to be different from existing assets (although the service provided is the same).
• **Indexed Acquisition Cost***	• Simpler to apply than MEA, as it does not require in-depth review of the assets.	• Simple indexation means there could be over or under valuation of assets when compared to the true market value. • Does not take into account technical efficiency.
Deprival Value	• Provides most accurate economic valuation.	• Highly complex as it requires a detailed modeling of system to determine asset values.
Replacement Cost less Stranded Assets	• In addition to the advantages as per those for Replacement Cost, it has the benefit of removing stranded assets.	• Considerable judgement will have to be utilised to identify the stranded assets in the distribution system. • Can be a deterrent to investment if the utility believes the regulator will strand an asset.

* This method is placed here, as it is a reasonable proxy for the replacement cost approach.

Compiled by the RIC

The acquisition cost approach, indexed with inflation, is a reasonable proxy for the replacement cost approach and reduces the risk of overvaluation of the asset base and the associated return on assets. This approach will maintain regulatory certainty and ensure that T&TEC can earn a reasonable return on its assets and support future investment.

Final Decision

The RIC received no dissenting views on its approach to establishing the RAB.

The RIC's final decision is to utilise the acquisition approach, indexed with inflation to value assets for establishing the RAB.

3.3 REGULATORY DEPRECIATION

Depreciation profiles allocate the original capital cost of projects over their useful lives. There are several methods to depreciate assets. However, the most common methods are straight-line, declining balance, and sum-of-years-digits. The declining balance method calculates depreciation as a portion of the declining value of the asset, while the sum of digits method is generally considered to be more appropriate for industries which are experiencing significant technical progress. For PRE1, the RIC adopted the straight-line method as it was considered to be superior to the alternatives in terms of simplicity, consistency and transparency. In addition, this method has other benefits, notably:

- It fully depreciates the assets over its useful life.
- It is generally considered to be a reasonable representation of economic depreciation for network assets in this industry given the design/expected life of these assets.

The RIC will continue to apply the straight-line method of depreciation for PRE2 to calculate the allowance for regulatory depreciation because of its inherent advantages but also because it maintains regulatory certainty.

Stakeholder Comments and Final Decision

The RIC received no dissenting views on this matter, although one respondent mistakenly believed that T&TEC was being allowed depreciation twice and that this expense was essentially being double counted. Depreciation, as an allowed cost, passes into the revenue requirement only once, as the return of capital.

The RIC's decision is to apply the straight-line method of depreciation to calculate the allowance for regulatory depreciation for PRE2.

3.4 LENGTH OF THE ASSET LIVES

The length of asset lives applied to assets impacts the level of depreciation that the service provider receives on those assets each year during the regulatory control period. **The RIC has used the asset lives established for PRE1 which were provided by T&TEC,** as these continue to be broadly in line with international benchmarks and to maintain regulatory precedent and regulatory certainty. The asset lives and depreciation rates are shown in Table 3.2 below.

Table 3.2: Class of Assets and Depreciation Rates

Class of Assets	Depreciation Rate (%)	Standard Useful Life (Years)
	T&TEC	T&TEC
Land – Leasehold	2.0	50
Buildings	3.33	30
Generating Assets:		
- Steam Production Plant	-	-
- Hydraulic Production Plant	-	-
- Diesel Generators	5.0	20
- Gas Turbine	-	-
Transmission Assets:		
- Control gear/Switchgear	4.0	25
- Transformers	4.0	25
Distribution Assets:		
- Overhead Mains	3.33	30
- Underground Mains	2.5	40
- Submarine Cables	6.67	15
- Meters	6.67	15
Other:		
- Street lights	5.0	20
- Test Equipment	6.67	15
- Supervisory Control System	4.0	25
- Electronic Equipment	10.0	10
- Communication Equipment	20.0	5
- Computer Equipment	16.67	6
- Furniture & Office Equipment	10.0	10
- Automobiles	25.0	4

3.5 ROLLING FORWARD THE RAB

After calculating the initial value of the RAB, further steps are required to establish RAB values for each year of the regulatory control period. To roll forward the RAB to the end of PRE2, the RIC:

- indexed the annual RAB for forecast inflation. It should be noted that the inflation adjusted amount is generally treated as a revaluation gain and the service provider does not receive a return on the gain;
- added the forecast efficient capital expenditure to the RAB of the previous year;
- deducted regulatory depreciation; and
- deducted forecast disposals of assets.

The derived RAB values for each year are used to establish the value of the building-blocks for calculating the annual forecast revenue requirements for PRE2. **Table 3.3 below shows the approved RAB for each year of PRE2.**

Table 3.3: RIC's Approved Annual Values of RAB ($'000)

	2023	2024	2025	2026	2027
Opening Value	5,415,045	5,700,732	6,026,476	6,198,458	6,350,224
Inflation Adjustment	249,092	216,628	126,716	123,969	120,654
Capex	316,870	389,140	326,820	308,830	335,660
Less Depreciation	(279,275)	(279,024)	(280,554)	(280,033)	(280,835)
Less Disposals	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)
Closing RAB	5,700,732	6,026,476	6,198,458	6,350,224	6,524,703

Calculated by the RIC

4 COST OF CAPITAL

4.1 INTRODUCTION

The rate of return or cost of capital plays a central role in compensating the service provider for its past investment. It also provides guidance as to the return on future investment. The amount of revenue to be collected by the service provider from its customers to cover this cost is calculated by multiplying the cost of capital by the annual value of the RAB over the regulatory control period. The cost of capital is a very significant element in the determination of price controls in a capital-intensive sector, as it is applied not only to future investment, but to the entire RAB. It should enable the service provider to meet its cost of capital and therefore finance its operations. The cost of capital is not intended to provide a floor on returns, since actual returns could potentially fall (or increase) because of under or outperformance of assumptions underpinning the revenue requirement.

Section 6 (1) (c) of the RIC Act stipulates that the RIC must ensure that a service provider, operating under prudent and efficient management, must be on terms that will allow it to earn sufficient return to finance necessary investment. The RIC's objective, therefore, is to ensure that the allowed rate of return is such that the service provider can finance its efficient operation and earn sufficient return to finance necessary investment.

4.2 ESTIMATING THE COST OF CAPITAL

The estimation of the cost of capital is not a mechanical process, in part because it concerns market perceptions about the future, and full information is generally not known about the investor's expected return and future market conditions. Although modern finance theory provides useful tools, many judgements and assumptions are required, given national and international economic conditions. Therefore, several issues critical to the determination of the cost of capital were considered, among them being:

- the method for determining the cost of capital;
- the relevant input values; and
- the appropriate level of gearing.

There is considerable discussion within the regulatory literature surrounding the most appropriate approach to setting the cost of capital. Experience from several countries reveals that the cost of capital has been determined using the weighted average cost of capital (WACC) and the capital asset pricing model (CAPM)[13], which evaluate the cost of capital based on market/stock market performance. Although it may seem feasible to estimate a WACC for T&TEC, issues arise because T&TEC is State-owned and does not have debt or equity that is publicly traded. The RIC is, therefore, unable to establish a market-based measure of equity or debt for T&TEC in the same way that it is possible for a private utility. A number of other possible approaches were also considered and found not to be suitable.[14]

The RIC's decision on cost of capital was assessed based on its duties under the Act and criteria the RIC set out in PRE1. These criteria are:

- the effect on incentives now and in the longer-term;
- the effect on the service provider's financial sustainability;
- the effect on affordability; and
- consistency.

The RIC will continue to allow a current or forward-looking cost of capital for new debt. T&TEC's debt would normally be guaranteed by the Government, thus it receives better terms than would be available on the capital market. While T&TEC's projected a rate of 5.21%, the existing rate for 10-year Government issued bonds is 5.1%. The RIC has decided that it will utilise the rate for 10-year Government bonds as the projected rate, as it is prudent, at this stage, to assume local circumstances will not change significantly, and has modeled the allowed

[13] CAPM is the preferred methodology that many regulators utilise for determining the cost of equity.
[14] The other approaches considered were:

a) the use of a rate of return based on what has been utilised by other regulators. The tendency in recent years has been for a cost of capital of between 2% to 5% as the basis on which price controls were set. The obvious disadvantage to this approach is that circumstances in each jurisdiction differ and what may be appropriate in one may not be appropriate in another;
b) the application of an average of the observed historic real borrowing costs. This is straightforward, but if this approach were to be used, then it would not be appropriate to allow extra costs associated with embedded debt;
c) the use of an appropriate discount rate for public sector projects; and
d) the application of a modified version of the WACC approach. This option entails combining an observed real cost of debt with an estimate of an appropriate rate of return on the retained earnings (i.e. equity portion of T&TEC's RAB) in order to produce an allowed rate of return.

revenue accordingly. However, the RIC may review the cost of capital at the mid-term of the control period, to determine if an adjustment is required for the remainder of PRE2.

Stakeholder Comments and Final Decision

One respondent indicated that the RIC had proposed the use of the WACC as its preferred method for determining the cost of capital, which was not accurate. The same respondent also endorsed the use of the cost of debt as the cost of capital, which is in fact the RIC's approach. Finally, this respondent was of the view that the RIC's methodology "double-counted" the payment of interest by allowing interest into operating expenditure, as well as through the cost of debt.

This view was not accurate as interest is only recovered once, through the cost of debt.

The RIC's decision is to allow a current or forward-looking cost of capital for new debt of 5.1% and not to include a return to the Shareholder (Government). If there is a significant change in circumstances, the RIC may review the cost of capital at the mid-term of the control period to determine if an adjustment is required for the remainder of PRE2.

5 REVIEW OF ELECTRICITY DEMAND AND CUSTOMER FORECASTS

5.1 INTRODUCTION

Demand forecasts are an essential component of a price review process. The process for setting price controls involves the following steps:

(1) Estimation of the projected electricity consumption[15] (demand) during the period for which the price control is being established;

(2) Estimation of the efficient projected costs to be incurred by the service provider in supplying the expected demand;

(3) Estimation of the total projected revenue to be recovered by the service provider for the supply of this demand, at the current tariffs; and

(4) Determination of the revised tariffs, to meet the gap (if any) between the revenue requirement and the expected revenue from current tariffs.

The RIC assessed the demand forecasts utilised by T&TEC in preparing its capital and operating expenditure forecasts that underlie its proposed tariffs. Demand forecasts potentially play a significant role in two components of a regulatory review:

- Determining the required capital (and to a lesser extent, operating) expenditures. Capital and operating expenditures, in turn, are major inputs into the revenue required.
- Determining tariffs to apply under the revenue cap.

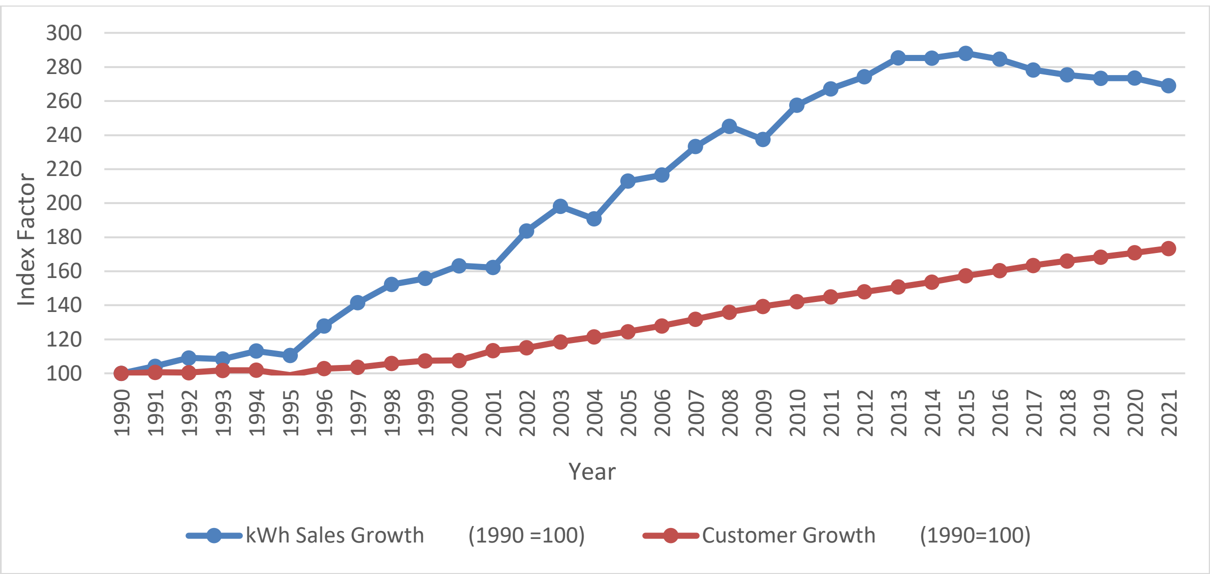
The two components require different, but related demand forecasts. Forecasts of system peak demand (maximum demand) are more relevant to capital expenditure requirements while forecasts of energy demand and customer numbers are more essential to the determination of tariffs.

[15] Electricity demand is used interchangeably with energy demand, energy consumption, or energy sales.

5.2 ANALYSIS OF HISTORICAL DATA

A brief analysis of energy demand and customer numbers, using data provided by T&TEC for the period 1990–2021, is provided below. Overall, the sale of electricity doubled for all classes of customers between 1990 and 2021. Figure 5.1 presents a graphical representation of the increase in energy sales and the number of electricity customers from 1990 to 2021. However, the relevant period that was analysed for the remainder of this section is 2010 to 2021, given that the last regulatory period (PRE1) ended in 2011,

<u>Figure 5.1: Growth in Sales of Energy and Customers, 1990–2021</u>



Compiled by the RIC

Table 5.1 shows energy demand/sales by class for the period 2010–2021. Total energy sales increased at a compound average growth rate (CAGR)[16] of 0.40 % between 2010–2021. A closer examination of the components of overall growth reveal that residential sales grew at a CAGR of 3.45%, commercial sales grew by 1.01% and street lighting sales at a CAGR of 1.45% during this period. Conversely, industrial sales experienced an overall negative growth with a CAGR of -1.62% over the period.

[16] The CAGR is the mean annual growth rate, typically of an investment, over a specified period longer than one year. It is used here to show the mean annual growth rate for the specified period.

With respect to the share of different classes of customers in the total energy demand[17], residential, commercial and street lighting classes all increased during the period. The share of residential demand increased significantly over the period, from 28.70% in 2010 to 39.88% in 2021, while the share of commercial demand increased from 9.75% to 10.42% over the same period. However, the share of demand for the industrial class declined significantly over the period, from 60.16% in 2010 to 48.13% in 2021.

Table 5.1: Energy Demand (GWh) by Class, 2010–2021

YEAR	Residential		Commercial		Industrial		Street Lighting		Total
	GWh Sold	Share (%)	GWh Sold	Share (%)	GWh Sold	Share (%)	GWh Sold	Share (%)	GWh Sold
2010	2,271.09	28.70%	771.26	9.75%	4,761.14	60.16%	110.67	1.40%	7,914.16
2011	2,352.14	28.64%	784.13	9.55%	4,963.54	60.44%	112.16	1.37%	8,211.97
2012	2,447.94	29.04%	813.36	9.65%	5,051.78	59.94%	115.46	1.37%	8,428.54
2013	2,568.78	29.29%	867.39	9.89%	5,216.00	59.48%	117.24	1.34%	8,769.41
2014	2,618.85	29.87%	909.10	10.37%	5,119.86	58.40%	119.16	1.36%	8,766.97
2015	2,753.68	31.11%	976.35	11.03%	5,001.45	56.50%	121.15	1.37%	8,852.63
2016	2,908.27	33.25%	1015.18	11.61%	4,700.37	53.74%	122.60	1.40%	8,746.42
2017	2,939.76	34.37%	1003.48	11.73%	4,487.49	52.46%	123.39	1.44%	8,554.12
2018	2,951.97	34.88%	979.65	11.58%	4,407.45	52.08%	124.02	1.47%	8,463.09
2019	3,082.25	36.69%	996.46	11.86%	4,196.53	49.95%	126.18	1.50%	8,401.42
2020	3,330.40	39.62%	900.60	10.71%	4,045.33	48.13%	129.16	1.54%	8,405.49
2021	3,297.58	39.88%	861.40	10.42%	3,979.22	48.13%	129.62	1.57%	8,267.82
CAGR	3.45%		1.01%		-1.62%		1.45%		0.40%

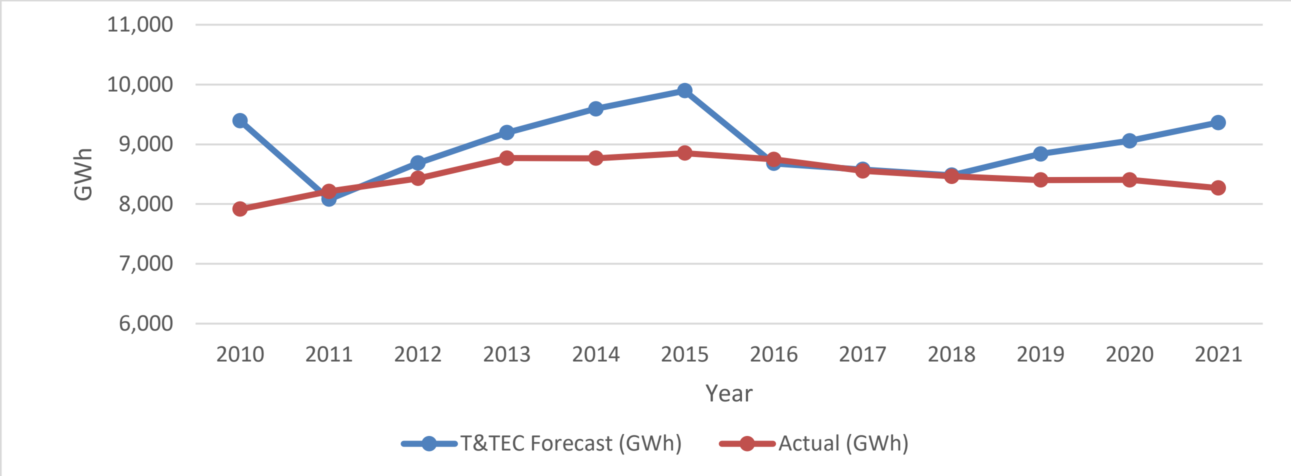
Compiled by the RIC

5.2.1 Comparison of historical data against past T&TEC forecasts

The actual growth in energy consumption over the period 2010–2021 was slightly lower than what was forecast by T&TEC (Figure 5.2) for most of the period. Overall, actual consumption showed a positive trend, which ranged between -1.6% and 18.6%, except in 2011 when there was a negative 1.6% variance, as actual consumption was higher than the corresponding forecast for that year.

[17] Represented in Gigawatt hours (GWh).

Figure 5.2: Energy Consumption: Actual vs. T&TEC Forecast, 2010–2021

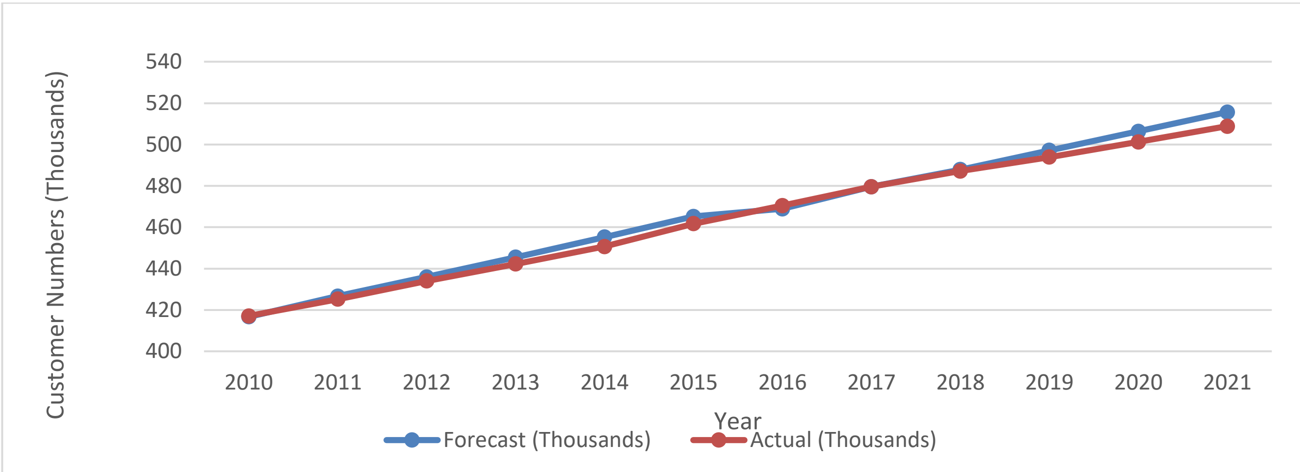


	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
T&TEC Forecast (GWh)	9,392	8,080	8,686	9,195	9,594	9,898	8,681	8,579	8,483	8,838	9,058	9,363
Actual (GWh)	7,914	8,212	8,429	8,769	8,767	8,853	8,746	8,554	8,463	8,401	8,405	8,268
Variance (%)*	**18.6**	**-1.6**	**3.1**	**4.9**	**9.4**	**11.8**	**0.1**	**0.2**	**0.2**	**5.2**	**7.8**	**13.3**

Compiled by the RIC
* Variance refers to forecast errors as a percentage (%) of actual.

Over the same period, the forecast growth in customer numbers was fairly accurate, as shown in Figure 5.3. The average variation between actual and forecast customer numbers was 0.5% over the period.

Figure 5.3: Customer Numbers: Actual vs. T&TEC Forecast, 2010–2021



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
T&TEC Forecast (Thousands)	416.7	426.7	436	445.5	455.2	465.2	468.9	479.6	487.9	497.1	506.4	515.7
Actual (Thousands)	417.1	425.2	434	442.2	450.7	461.7	470.5	479.6	487.2	493.9	501.3	508.8
Variance (%)*	**-0.1**	**0.4**	**0.5**	**0.8**	**1.0**	**0.8**	**-0.3**	**0.0**	**0.14**	**0.7**	**1.0**	**1.3**

Compiled by the RIC
* Variance refers to forecast errors as a percentage (%) of actual.

5.3 FORECASTS OF SALES, CUSTOMER NUMBERS AND PEAK DEMAND

The level of sales and the number of customers have a direct impact on the revenue requirement and tariffs, as forecasts of costs are heavily influenced by the forecast of sales and customer numbers. On the one hand, higher demand and increasing customer numbers lead to a higher revenue requirement. On the other hand, once the revenue is set, higher forecast sales can lead to a lower consumption charge, and higher numbers of customers can lead to a lower fixed charge. In cases where forecasts differ significantly from actual figures, this will result in an over or under recovery of T&TEC's required revenue. It is essential, therefore, that the forecasts of sales and customer numbers are reasonably accurate.

Many forecasting techniques have been developed, ranging from very simple extrapolation methods to more complex time-series and hybrid models that combine several approaches.

Straight-line extrapolation of historical trends has served well for forecasting electricity demand. However, with the fluctuation in energy prices, the emergence of alternative fuels, new technologies and changes in lifestyles, more sophisticated modeling techniques are also being used. An appropriate method is generally chosen based on the nature of the data available and the desired level of detail of the forecasts. Typically, the accuracy of the forecast increases with the size of the database used. However, there is a practical limit to the quantity of data that is cost-effective to collect, and the additional value of the information gained.

5.3.1 T&TEC's Forecasts

T&TEC's forecasts of customer numbers, energy sales, and system peak demand were derived from a combination of forecasting methods including econometric models, exponential smoothening and judgement. Its forecasts consisted of 10-year projections for residential (Rate A), commercial (Rates B and B1), small and large industrial (Rates D1, D2, D3, D4, E1 and E2) and street lighting customers (Rate S). T&TEC was not in a position to provide forecast customer numbers or demand for the proposed rate class C or High Load Factor (HLF)/ High Density Load (HDL) customers.

Table 5.2 below shows T&TEC's forecasts of electricity sales and customer numbers. T&TEC projected that its sales would increase by 14% from 8,526 GWh in 2022 to 9,743 GWh in 2027. Sales to industrial customers are expected to continue to account for the largest portion of total sales and are projected to increase by 10% over the period. Sales to residential customers are predicted to account for 41% with an increase of 21% over the period 2022–2027. Sales to commercial customers are predicted to account for 11% of total sales, with an increase of 12%, over the period 2022–2027. Sales for public lighting are expected to increase by 9% from 134 GWh in 2022 to 146 GWh in 2023, accounting for about 2% of total sales for each year in the period.

Based on T&TEC's forecast, residential customer numbers will account for approximately 88% of all customers at the end of the period. The number of residential customers is expected to grow by 8%, from 457,148 in 2022 to 494,223 in 2027. The number of commercial customers is anticipated to increase by 7% from 56,252 in 2022 to 60,134 in 2027, accounting for 11% of total customers. The number of industrial customers is forecast to increase by 9% from 3,930 in 2022 to 4,289 in 2027 and these customers will account for less than 1% of total customers over the period. The number of public lighting[18] accounts is expected to be maintained at 48, over the period.

Table 5.2: T&TEC's Forecasts of Sales and Customer Numbers 2022–2027

	2022	2023	2024	2025	2026	2027
Electricity Sales (GWh):						
Residential	3,298	3,430	3,564	3,701	3,842	3,987
Commercial	974	997	1,020	1,044	1,067	1,091
Industrial	4,120	4,164	4,404	4,439	4,478	4,519
Public Lighting	134	136	138	141	143	146
Total	**8,526**	**8,727**	**9,126**	**9,325**	**9,530**	**9,743**
Customer Numbers (Accounts):						
Residential	457,148	464,563	471,978	479,393	486,808	494,223
Commercial	56,252	57,028	57,805	58,581	59,358	60,134
Industrial	3,930	4,018	4,086	4,154	4,221	4,289
Public Lighting	48	48	48	48	48	48
Total	**517,378**	**525,657**	**533,917**	**542,176**	**550,435**	**558,694**

Source: T&TEC

System peak demand was forecasted to be 1,371 MW in 2022 and projected to be 1,581 MW in 2027. This represents a compounded average growth rate of 2.89%, as shown in Table 5.3 below.

Table 5.3: T&TEC's Forecast for Peak Demand (MW) 2022–2027

Year	Peak Demand (MW)	% Change
2022	1,371	
2023	1,407	2.63%
2024	1,472	4.62%
2025	1,507	2.38%
2026	1,544	2.46%
2027	1,581	2.40%
CAGR		**2.89%**

Source: T&TEC

[18] Regional Corporations and other State agencies are now administratively responsible for the public lighting customer class.

5.4 RIC's FORECASTS

The RIC considered several forecasting approaches for estimating future levels of energy demand, customer numbers and system peak demand. The RIC's task was to determine whether T&TEC's data sources were credible and to evaluate the robustness of the forecasts.

In PRE1, the RIC utilised the following methods to forecast the electricity demand and customer numbers: Autoregressive Integrated Moving Average (ARIMA) modeling, Vector Autoregression (VAR) modeling, and Simple Linear Trending. When the ARIMA model was employed, the results did not closely correspond to observed values over the sample period (*ex-post* forecasting). The VAR models tended to correspond more closely to observed values, and evidenced lower variation between the actual and estimated series, and the confidence intervals for these estimates were fairly wide and increasing. However, Simple Linear Trending Analysis produced the best results, that is, results closely approximated the observed sample values to between 1.1 and 3.3%. For PRE2, the RIC conducted several forecasting exercises, and the outputs of the various approaches were similar to those observed in PRE1. Therefore, scenarios were run using several trending approaches and judgement, and forecast accuracy was measured through forecast variance.

5.4.1 Electricity Demand Forecasts

Among the various trending approaches employed, the linear trending method produced the lowest average variation for residential, commercial, industrial and public lighting demand. The estimates derived from this technique closely approximated the observed sample values. Observed values of electricity sales with corresponding forecasts, forecast errors for the various classes of customers for the observed period 2010–2021 and an extended forecast for the period 2022–2027, using trending and judgement, are shown in Table 5.4 below.

Table 5.4: Actual Values, Forecasts and Forecast Errors for Electricity GWh Sales, 2010–2027

YEAR	Residential			Commercial			Industrial			Street Lighting		
	Actual (GWh)	Forecast (GWh)	Variance %	Actual (GWh)	Forecast (GWh)	Variance %	Actual (GWh)	Forecast (GWh)	Variance %	Actual (GWh)	Forecast (GWh)	Variance %
2010	2,271	2,255	-0.72%	771	775	0.48%	4,761	4,675	-1.81%	111	91	-17.77%
2011	2,352	2,359	0.28%	784	811	3.39%	4,964	5,149	3.74%	112	113	0.75%
2012	2,448	2,463	0.61%	813	847	4.08%	5,052	5,068	0.33%	115	115	-0.40%
2013	2,569	2,567	-0.07%	867	882	1.72%	5,216	4,988	-4.37%	117	117	-0.21%
2014	2,619	2,671	1.99%	909	918	0.99%	5,120	4,907	-4.15%	119	119	-0.13%
2015	2,754	2,775	0.78%	976	954	-2.30%	5,001	4,827	-3.50%	121	121	-0.12%
2016	2,908	2,879	-1.00%	1015	990	-2.51%	4,700	4,746	0.97%	123	122	-0.49%
2017	2,940	2,983	1.48%	1003	1026	2.20%	4,487	4,665	3.96%	123	124	0.49%
2018	2,952	3,028	2.58%	980	1061	8.34%	4,407	4,577	3.85%	124	126	1.60%
2019	3,082	3,089	0.20%	996	1097	10.10%	4,197	4,669	11.26%	126	128	1.44%
2020	3,330	3,150	-5.41%	901	1133	25.79%	4,045	4,762	17.72%	129	130	0.65%
2021	3,298	3,213	-2.55%	861	1169	35.68%	3,979	4,857	22.07%	130	131	0.82%
2022		3,207			906			4,122			131	
2023		3,257			952			3,936			132	
2024		3,308			955			3,838			134	
2025		3,358			959			3,740			135	
2026		3,408			963			3,643			136	
2027		3,458			966			3,545			138	
Average			**-0.15%**			**7.33%**			**4.17%**			**-0.15%**

Calculated by the RIC

Notes

1. Variance refers to forecast errors as a percentage (%) of actual.
2. It is important to note that in 2020 and 2021, the impact of Government restrictions because of the COVID-19 pandemic, impacted actual electricity sales for all customer classes, except for public lighting.

5.4.2 Customer Number Forecasts

The linear trending forecasting method also produced the lowest average variation for forecasting the number of residential, commercial and industrial customers. The estimates derived from this technique closely approximated the observed sample values. The RIC has decided not to forecast the number of public lighting customers as it is more practical to assume the number of public-lighting customers will remain fixed at the existing level for the forecast period because of the administrative changes which streamlined the billing of public lighting accounts to Regional Corporations and some State Agencies from 2011. Instead, the RIC utilised the existing number of public lighting fixtures (streetlights, traffic lights and recreation ground lights) as the basis for pricing.

Observed values of customer numbers with corresponding forecasts and forecast errors for the various classes of customers for the observed period 2010–2021 and an extended forecast for the period 2022–2027, using trending, are shown in Table 5.5 below.

Table 5.5: Actual Values, Forecasts and Forecast Errors for Electricity Customer Numbers, 2010–2027

YEAR	Residential			Commercial			Industrial		
	Actual	Forecast	Variance %	Actual	Forecast	Variance %	Actual	Forecast	Variance %
2010	375,569	370,639	-1.31%	38,371	39,290	2.40%	3,130	3,101	-0.93%
2011	382,882	378,708	-1.09%	39,027	41,151	5.44%	3,207	3,185	-0.69%
2012	390,188	386,777	-0.87%	40,463	43,013	6.30%	3,266	3,269	0.09%
2013	395,515	394,847	-0.17%	43,284	44,874	3.67%	3,338	3,353	0.45%
2014	400,818	402,916	0.52%	46,441	46,735	0.63%	3,429	3,437	0.23%
2015	408,356	410,985	0.64%	49,781	48,597	-2.38%	3,519	3,521	0.06%
2016	415,001	419,054	0.98%	51,858	50,458	-2.70%	3,605	3,605	0.00%
2017	422,405	427,123	1.12%	53,496	52,320	-2.20%	3,686	3,689	0.08%
2018	429,022	430,008	0.23%	54,453	54,181	-0.50%	3,737	3,773	0.96%
2019	435,439	437,963	0.58%	54,676	56,043	2.50%	3,804	3,857	1.39%
2020	442,415	446,066	0.83%	55,012	57,904	5.26%	3,835	3,941	2.76%
2021	449,680	454,318	1.03%	55,335	59,765	8.01%	3,829	4,025	5.12%
2022		456,680			56,252			4,112	
2023		464,148			56,801			4,114	
2024		471,141			57,171			4,191	
2025		478,134			57,667			4,269	
2026		485,127			58,689			4,346	
2027		492,120			59,702			4,424	
Average			**-1.00%**			**0.96%**			**-0.49%**

Calculated by the RIC
* Variance refers to forecast errors as a percentage (%) of actual

5.4.3 Peak Demand Forecasts

The RIC has generally utilised two methods for producing peak demand forecasts; ARIMA and simple linear trending. Both have produced good results historically; however, the trending method typically produces lower average variation, which is preferable.

The accuracy of peak demand forecasts was measured by examining the forecast variance. Observed values of peak demand with corresponding forecasts and forecast errors for the period 2010–2021 and an extended forecast for the period 2022–2027, using trending, are shown in Table 5.6 below. The average variation between actual and forecasted customer numbers was 0.10% over the period.

Table 5.6: Actual Values, Forecasts and Forecast Errors for Peak Demand (MW)

YEAR	Actual	Forecast	Variance %
2010	1,222	1,209	-0.01%
2011	1,275	1,238	-0.03%
2012	1,322	1,268	-0.04%
2013	1,348	1,298	-0.04%
2014	1,343	1,329	-0.01%
2015	1,396	1,361	-0.03%
2016	1,339	1,394	0.04%
2017	1,355	1,427	0.05%
2018	1,319	1,388	0.05%
2019	1,370	1,421	0.04%
2020	1,360	1,455	0.07%
2021	1,356	1,490	0.10%
2022		1,389	
2023		1,397	
2024		1,405	
2025		1,414	
2026		1,422	
2027		1,431	
Average			**0.10%**

Calculated by the RIC

5.5 RIC's APPROACH

Forecasting consumption of electricity is normally challenging, and the current economic climate compounds the challenges. Supply disruptions continue to place inflationary and supply-chain pressures on economies worldwide, and the local economy is not immune. Additionally, the models that were used to predict consumption growth in the past may require modification, in particular due to the potential increase in the uptake of electric vehicles.

In its Draft Determination, the RIC carefully considered T&TEC's forecasts and also produced its own forecasts for electricity consumption and customer numbers. In that document, the RIC stated that it was confident that its forecasts for residential and commercial customers were robust, and would use them for pricing purposes. The RIC's preferred approach for industrial and public lighting customers was to use T&TEC's forecasts for electricity consumption and customer numbers. The industrial class comprises a relatively small number of large customers, whose production activity is typically not heavily dependent on local economic drivers. Their entry onto T&TEC's network is relatively infrequent and irregular, thereby making statistical forecasting of their numbers and aggregate electricity demand largely infeasible. For these reasons, the RIC preferred to use the forecast changes in customer numbers, energy sales and billed maximum demand provided by T&TEC, as these were based heavily on data from such prospective customers on in-service dates and demand ramp-up schedules. The RIC also indicated that statistical forecasting of electricity consumption for public lighting was also usually difficult as the public lighting programme administered by the Ministry of Public Utilities is funded under the Ministry's Public Sector Investment Programme (PSIP). Hence, the increase in the number of streetlights depends on budgetary allocations which vary annually, therefore, this affects forecasts for this class.

The RIC's electricity demand and customer number forecasts for pricing purposes are presented in Table 5.7.

Table 5.7: Forecasts to be used for Pricing Purposes 2023–2027

	2023	2024	2025	2026	2027
Electricity Sales (GWh):					
Residential	3,257	3,308	3,358	3,408	3,458
Commercial	952	955	959	963	966
Industrial	4,164	4,404	4,439	4,478	4,519
Public lighting	136	138	141	143	146
Total	**8,509**	**8,805**	**8,897**	**8,992**	**9,089**
Customer Numbers:					
Residential	464,148	471,141	478,134	485,127	492,120
Commercial	56,801	57,171	57,667	58,689	59,702
Industrial	4,018	4,086	4,154	4,221	4,289
Public lighting	48	48	48	48	48
Total	**525,015**	**532,446**	**540,003**	**548,085**	**556,159**

Compiled by the RIC

Note: The RIC's 2022 forecasts in Tables 5.4, 5.5 and 5.6 were omitted when compiling this table, as 2022 forecasts are not applicable for the 2023–2027 control period.

The RIC notes that under the revenue cap framework, the effects of the forecasts do not impact on the total revenue collected, but instead, they impact on the timing of revenue collection. If the forecast is too high then less revenue is collected than intended resulting in higher tariffs in subsequent periods, and vice versa. Additionally, to reduce the effects of the forecasts, the RIC places greater reliance on the revised forecasts as submitted at the annual price/tariff approval process.

Stakeholder Comments and Final Decision

Following the publication of the Draft Determination, one respondent proposed the use of Artificial Intelligence (AI) and Machine Learning (ML) as possible models that the RIC can utilise for forecasting.

The greater the variability and intermittency of generation, the more complex is the management of those electricity systems, and these techniques can assist with the highly complex tasks associated with modelling demand response (DR) for real time pricing (RTP) and critical peak pricing (CPP) in those systems. However, the RIC understands that these techniques are more relevant in jurisdictions which have high levels of renewable energy resources in their generation mix. Locally, there are some components within the electricity network (such as, AMI smart meters) that can facilitate demand response programmes (price-based or incentive/contract based). However, all the necessary systems within the network are not in place to roll out robust demand response within PRE2. Hence, the forecast methods utilised by T&TEC, which have been validated by the RIC, remain fit for purpose.

The RIC's decision is to adopt demand forecast for customer numbers and energy consumption shown in Table 5.7.

6 REVIEW OF THE PERFORMANCE OF T&TEC

6.1 INTRODUCTION

The RIC is mandated by its Act to prescribe and enforce standards with respect to the quality, continuity and reliability of service, as well as to carry out studies of efficiency and economy of operation, and of performance of service providers. As part of a price review, it is important to have an overall understanding of the service provider's performance in areas such as service delivery and its financial performance. In the chapters that follow, details of T&TEC's performance in areas such as operating expenditure, capital expenditure and service quality issues will be presented. The RIC also publishes annual reports of T&TEC's performance against Quality of Service Standards (QSS) and other technical/financial performance indicators, and details of T&TEC's historical performance in this regard can be found in those reports.

This chapter discusses T&TEC's productivity, financial performance and average tariffs over the five-year period 2017–2021. In order to contextualise the discussion, key data for the transmission and distribution sector, over the period 2017 to 2021 are presented in Table 6.1 below.

Table 6.1: Key Data for T&TEC, 2017–2021

	2017	2018	2019	2020	2021
Total Service Area (sq Km)	5,128	5,128	5,128	5,128	5,128
Total Network Length (Km)	22,829	23,064	24,401	24,653	24,887
Maximum Demand (MW)	1,355	1,319	1,370	1,360	1,356
Energy Sold (GWh)					
Domestic Customers	2,952.0	2,952.0	3,082.4	3,330.4	3,297.6
Commercial Customers	990.4	967.6	984.4	893.9	854.7
Industrial Customers	4,479.50	4,418.8	4,208.6	4,052.0	3,985.9
Total Number of Employees	3,149	3,075	2,991	2,903	2,888
Customers					
Total Number of Customers	479,632	483,559	493,965	501,309	508,892
Customers per sq Km of service area	94	94	96	98	99
Customers per Km of network length	21	21	20	20	20

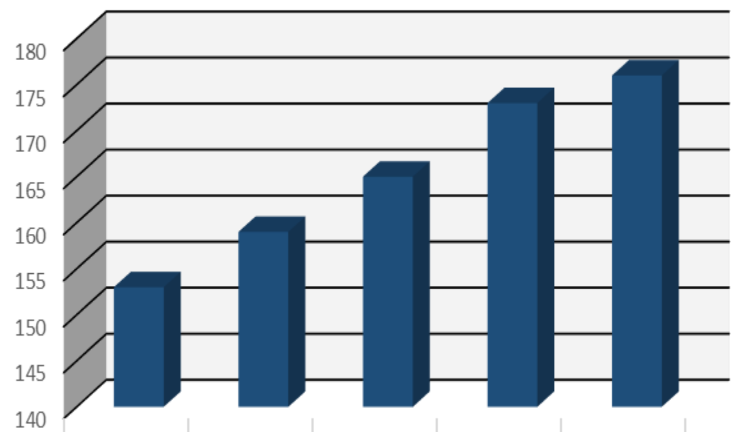
Source: T&TEC

6.2 PRODUCTIVITY TRENDS

6.2.1 Labour Productivity

Productivity trends are indicators of the level of efficiency of an entity. In the electricity transmission and distribution sector, customers per employee and electricity sales per employee are the two most widely used indicators of labour productivity. T&TEC's customers per employee indicator improved from 153 in 2017 to 176 in 2021 (see Figure 6.1), and was better than some electric utilities in the region such as the Cayman Islands (135) and Dominica (170), but worse than utilities in St. Lucia (256), Belize (334) and Jamaica (526).

Figure 6.1: Customers Per Employee, 2017–2021

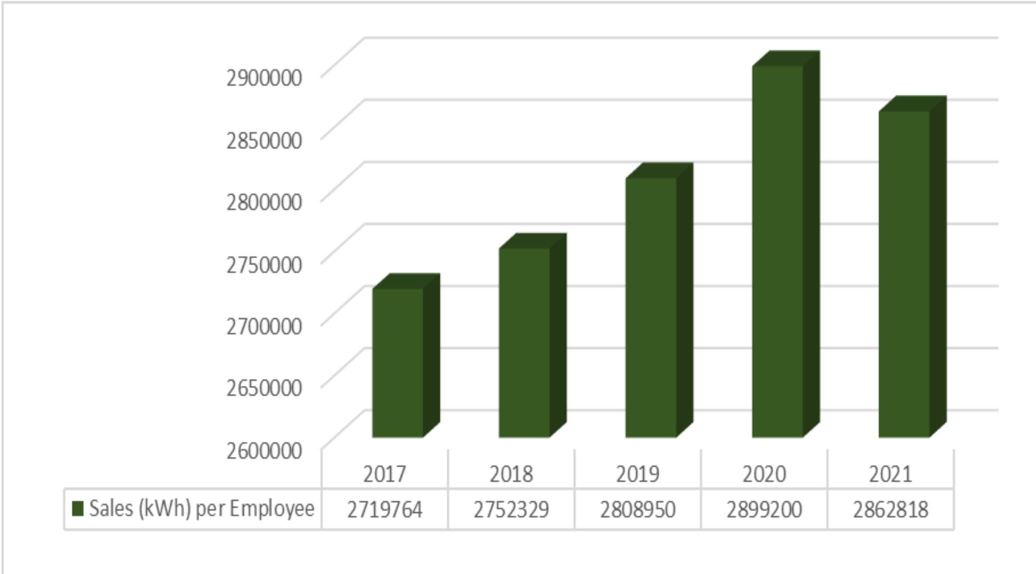


	2017	2018	2019	2020	2021
Customers per Employee	153	159	165	173	176

Source: RIC

T&TEC's kWh sales per employee indicator improved from 2.72 million kWh in 2017 to 2.86 million kWh in 2021; see Figure 6.2. In comparison to countries in the region, T&TEC's performance in 2021 was better than several countries, including, St. Lucia (1.28 million kWh/employee), Belize (1.75 million), Jamaica (2.37 million), and the Cayman Islands (2.76 million).

Figure 6.2: Sales (kWh) Per Employee, 2017–2021



Source: RIC

6.2.2 Other Productivity Indicators

The real operating cost per MWh sales, and the real operating cost per customer are two additional productivity metrics that are measured, see Table 6.2. T&TEC's real operating cost per MWh sales showed, on average, no change over the period, while real operating costs per customer decreased, on average, by 2.24 %.

Table 6.2: Other Productivity Indicators, 2017–2021

	2017	2018	2019	2020	2021	Average
Real Operating Cost per MWh sales ($/MWh)	355.23	343.33	345.78	412.60	343.88	-
% Change	**-**	**(3.35)**	**0.71**	**19.32**	**(16.66)**	**(0.005)**
Real Operating Cost per customer ($/cust.)	6,342.39	5,962.80	5,880.46	6,917.20	5,586.18	-
% Change	-	**(5.98)**	**(1.38)**	**17.63**	**(19.24)**	**(2.24)**

Calculated by the RIC

6.3 FINANCIAL PERFORMANCE

In Table 6.3 a snapshot of T&TEC's financial performance from 2017–2021 is presented. T&TEC's last tariff adjustment occurred in 2009 and covered the fourth year of PRE1, June 1, 2009 to May 31, 2010.[19] T&TEC's financial performance has declined as it maintained an average annual deficit of $1,132 million over the period, due in part, to stagnated rates. T&TEC's receivables position was also very weak, with $1,624 million owed to the utility at the end of 2021; 81.8% of which is attributable to the Government and Government agencies (see Table 6.7). Further details on T&TEC's recent financial performance can be found in the **"Review of Status of T&TEC"**.

Table 6.3: Key Financial Statistics, 2017–2021

	2017 $Million	2018 $Million	2019 $Million	2020 $Million	2021 $Million
Total Revenue	3,217.50	3,229.68	3,276.37	3,331.00	3,255.66
Operating Expenditure	3,371.20	3,121.67	3,152.01	3,787.14	3,167.22
Depreciation	499.50	477.00	514.28	547.41	542.65
Net Interest Payments	489.60	449.72	632.49	629.32	609.42
Total Expenditure	4,340.30	4,048.32	4,298.78	4,963.87	4,319.29
Surplus (Deficit)	(1,122.80)	(818.71)	(1,022.41)	(1,632.87)	(1,063.63)
Total Assets (Book Value)	11,417.30	11,473.02	11,696.19	19,532.18	18,873.34
Total Liabilities	6,973.00	6,596.13	7,941.74	9,251.40	9,947.18
of which Net Debt	478.40	5,350.00	5,350.00	4,694.21	4,437.88
Operating Cash flow	88.10	(3,836.00)	1,744.20	1,420.20	1,501.90

Source: T&TEC

[19] No adjustments were made to T&TEC's tariffs for June 1, 2010 to May 31, 2011, as the existing rates allowed them to fully recover the revenue requirement.

6.3.1 Expenditure

T&TEC's total costs declined by 0.12% over the period as seen in Table 6.4 below. A further disaggregation of these costs is found in Tables 6.5 and 6.6.

Table 6.4: Generation, T&D & Other Costs, 2017–2021

Year	GENERATION			Transmission, Distribution & Administration ($ Million)	Depreciation, Interest & Finance and Other ($Million)	Total Expenditure ($ Million)
	Conversion ($Million)	Fuel and Own Generation ($Million)	Total Generation ($ Million)			
2017	1,036.9	985.7	2,022.6	1,380.0	937.8	4,340.3
2018	1,071.0	973.4	2,044.4	1,075.3	928.6	4,048.4
2019	1,056.2	1,038.2	2,094.5	1,058.0	1,146.3	4,298.8
2020	1,090.4	1,008.5	2,098.9	1,684.5	1,180.5	4,963.9
2021	983.2	1,077.8	2,061.0	1,108.4	1,149.9	4,319.3
CAGR*	**(1.32)%**	**2.26%**	**0.47%**	**(5.33)%**	**5.23%**	**(0.12)%**

Source: T&TEC *CAGR – Compound Average Growth Rate

Table 6.5: Components of Total Expenditure, 2020–2021

Expenditure Category	2020 TT ($Million)	2021 TT ($Million)	% Change
Conversion	1,090.4	983.2	(9.8)
Generation	1,008.5	1,077.8	6.9
Transmission	76.6	77.4	1.0
Distribution	580.7	561.1	(3.4)
Engineering	39.2	36.6	(6.6)
Administrative and General	988.0	433.3	(56.1)
Depreciation	547.4	542.6	(0.9)
Interest and Finance Costs	588.1	572.3	(2.7)
Interest on Suppliers' Credit	41.1	37.1	(9.7)
Loss (Gain) on Exchange	3.8	(2.2)	(157.9)
TOTAL	**4,963.9**	**4,319.3**	**(13.0)%**

Source: T&TEC Management Accounts, December 2021

Table 6.6: Transmission & Distribution Expenditure, 2017–2021

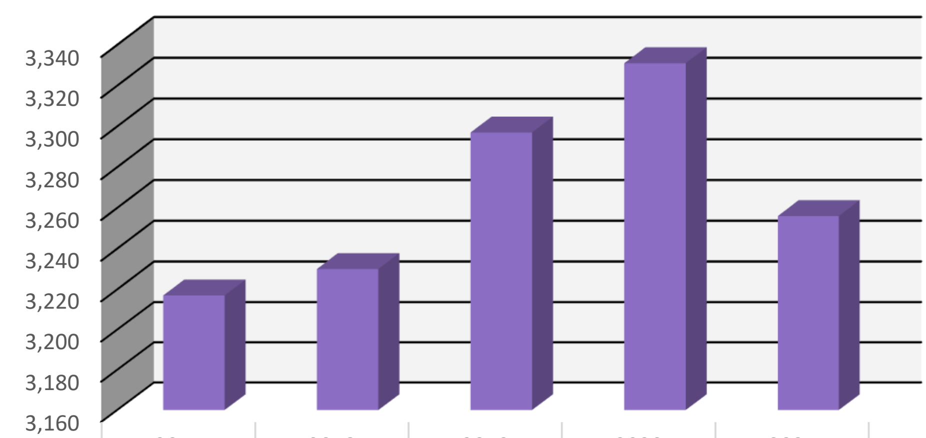
	2017 ($Million)	2018 ($Million)	2019 ($Million)	2020 ($Million)	2021 ($Million)
Transmission	**71.6**	**58.2**	**60.5**	**76.6**	**77.4**
Distribution	**683.1**	**571.9**	**572.1**	**580.7**	**561.1**
- Operations	271.4	265.4	263.6	297.0	281.2
- Maintenance	347.1	252.1	254.1	275.5	269.9
- Commercial	63.1	49.3	48.2	*	*
- Rates, Taxes, Insurance	1.5	5.1	6.2	8.2	10.0
Total Transmission & Distribution	**754.7**	**630.1**	**632.6**	**657.3**	**638.5**

*Note: In 2020 and 2021, T&TEC captured expenditure for Commercial under the Operations category.
Source: T&TEC Management Accounts

6.3.2 Revenue

T&TEC's total revenue from sales increased by 1.2% from $3,217 million in 2017 to $3,256 million in 2021, see Figure 6.3. However, total units sold decreased from 8,545.3 GWh to 8,267.8 GWh, a decline of 3.2%, while the unit cost of sales increased by 18.2% over the same period. Figure 6.4 shows the change in the unit cost of sales from 2017 to 2021*.

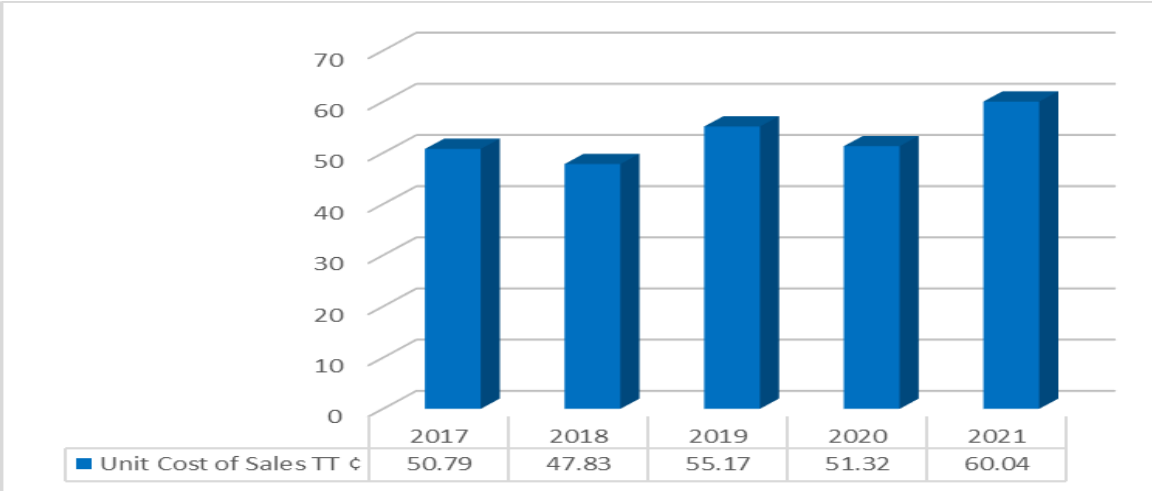
Figure 6.3: Light & Power Sales ($Million), 2017–2021



	2017	2018	2019	2020	2021
Total Sales ($TT M)	3,217	3,230	3,297	3,331	3,256

*The COVID-19 Pandemic adversely impacted sales to industrial customers. To some extent this would have been offset by residential demand as persons worked and students accessed online classes from home.

Figure 6.4: Unit Cost of Sales, 2017–2021



Source: RIC

6.3.3 Billing and Collections

One indicator that is typically used to measure the relative efficiency of a utility's commercial practices is the "Collection Period" (i.e. Accounts Receivable in days). Delayed collections can lead to significant cash flow problems. Table 6.7 reveals consistently high levels of receivables, including from the Government and Government agencies.

Table 6.7: Aged Analysis of Receivables as at December 2021 ($'000)

	0 - 30 Days	31 - 60 Days	61 - 120 Days	Over 120 Days	Total
Domestic & Commercial	105,575	36,926	33,556	207,903	383,960
Industrial	64,537	54,809	94,221	960,552	1,174,119
Street Lighting	17,505	8,221	17,523	23,147	66,396
Total	**187,617**	**99,956**	**145,300**	**1,191,602**	**1,624,475**
Of Which:					
Government	37,381	27,538	51,451	210,685	327,055
Statutory Boards	37,781	37,480	61,647	864,458	1,001,366
State Enterprises	321	18	10	27	376
Total	**75,483**	**65,036**	**113,108**	**1,075,170**	**1,328,797**

Source: T&TEC, 2021

Stakeholder Comments and Final Decision

Several commenters expressed deep concern with respect to the level of receivables and its impact on T&TEC's operations. They expressed the belief that T&TEC's inability to collect the outstanding revenue had precipitated the Price Review, and customers were being asked to fund this inefficiency through the tariffs.

The RIC acknowledges that the late collection of receivables from the Public Sector is a cause of concern. However, these receivables are not included in the proposed tariffs. To mitigate the effects of the outstanding receivables from the Public Sector, the RIC has recommended the reintroduction of the Reserve Vote system by the Government, which once implemented, would ensure that funds are transferred directly from the Ministry of Finance to T&TEC, thereby ensuring that the receivables are settled. T&TEC has received assistance from Government to settle outstanding debt to NGC and to fund capital expenditure through the Public Sector Investment Programme (PSIP). T&TEC has also indicated that it has implemented some measures to reduce outstanding receivables.

6.4 TARIFFS

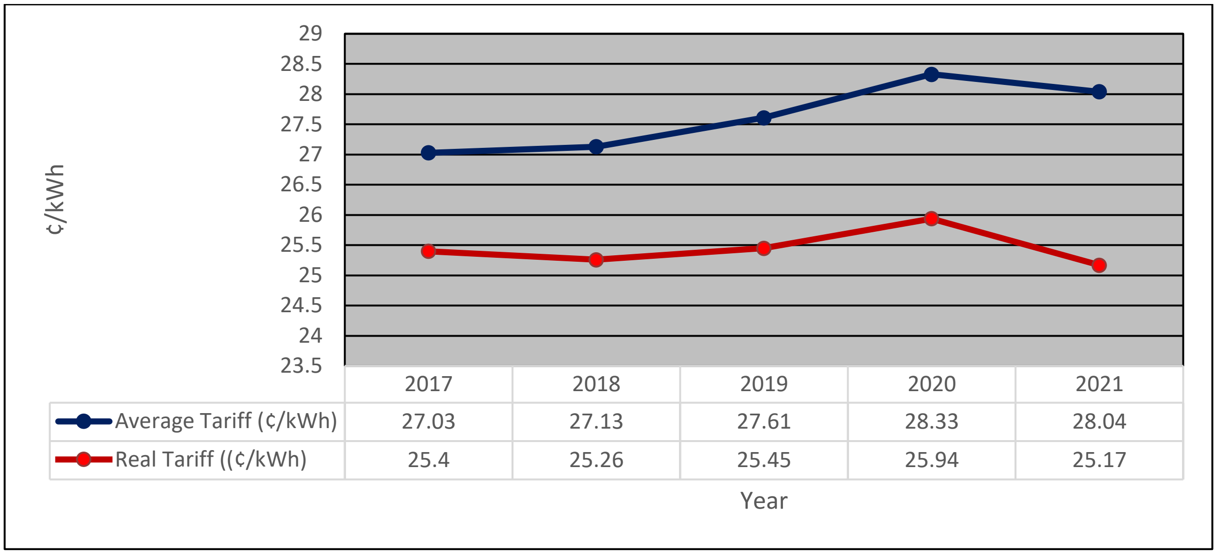
T&TEC's average electricity tariff decreased by 5% over the period 2017 to 2021, as shown in Table 6.8 and Figure 6.5.

Table 6.8: T&TEC's Average Tariff, 2017–2021

	2017	2018	2019	2020	2021
Average Tariff (¢/kWh)	27.03	27.13	27.61	28.33	28.04
Retail Price Index*	106.4	107.4	108.5	109.2	111.4
Real Tariff (TT¢)	25.40	25.26	25.45	25.94	24.17

*Base year – 2015; Source: Central Bank of Trinidad and Tobago
Table prepared by the RIC

Figure 6.5: T&TEC Average Tariff, 2017–2021



Calculated by the RIC

Table 6.9 shows energy sold and revenue collected between 2017 and 2021, by customer class. Residential customers' share of energy purchased increased from 35% in 2017 to 40% in 2021, with a consequential 12.8% increase in revenue generated from those sales. This occurred even while total kWh sold was declining. In the case of commercial customers, energy purchased declined by 13.7% over the five-year period, with a corresponding decline of 12.2% in revenue from sales. The share of energy consumption for commercial customers decreased from 11.6% to 10.3% over the period. For industrial customers, the share of energy consumption decreased from 52% in 2017 to 48% in 2021, while the share of revenue from the sale of electricity decreased from 49% to 33%.

Table 6.9: Energy Sold (GWh) and Revenue by Customer Class, 2017–2021

Year	Residential		Commercial		Industrial		*Total	
	GWh Sold	Revenue $ Million	GWh Sold	Revenue $ Million	GWh Sold	Revenue $ Million	GWh Sold	Revenue $ Million
2017	2,952.04	960.83	990.36	416.07	4,479.52	847.05	8,545.32	2,308.49
2018	2,951.98	962.63	967.60	412.14	4,419.82	836.22	8,463.41	2,295.94
2019	3,082.36	1,008.83	984.39	419.38	4,208.65	806.31	8,401.57	2,320.09
2020	3,330.40	1,097.06	893.93	381.78	4,052.00	773.24	8,405.49	2,340.34
2021	3,297.58	1,084.51	854.73	365.50	3,985.89	761.67	8,267.82	2,298.82

* Total includes Residential, Commercial, Industrial and Street Lighting.
Source: T&TEC

The average tariffs across customer classes over the period 2017 to 2021 are shown in Table 6.10.

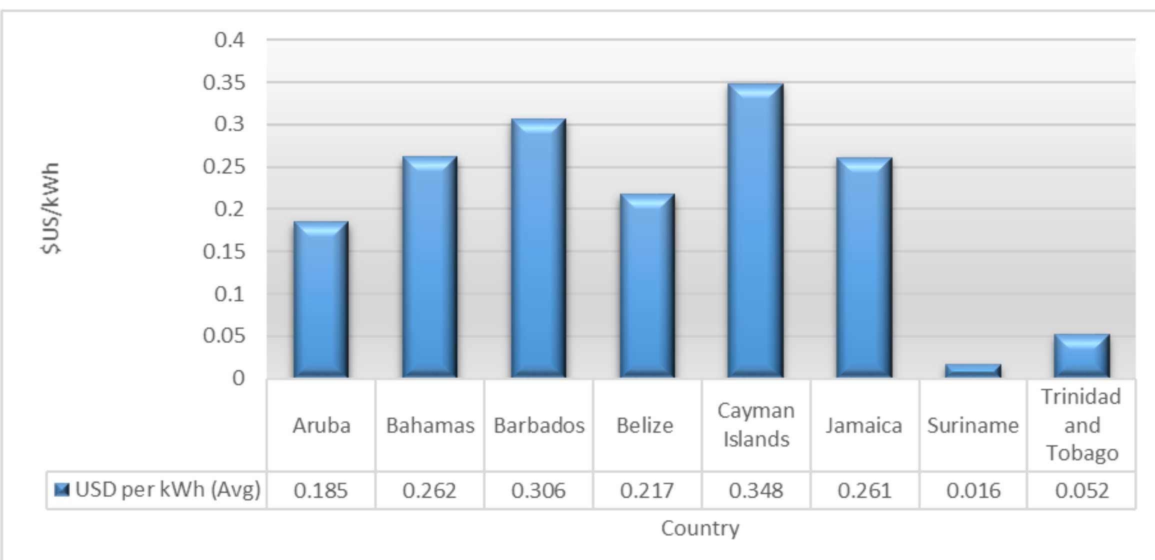
Table 6.10: Per Unit Average Revenue by Class, 2017–2021

Year	Residential Revenue / kWh TT(¢)	Commercial Revenue / kWh TT(¢)	Industrial Revenue / kWh TT(¢)	Total* Revenue / kWh TT(¢)
2017	32.55	42.01	32.76	27.03
2018	32.61	42.59	18.92	27.13
2019	32.73	42.60	19.16	27.61
2020	33.33	42.79	19.08	28.33
2021	33.17	42.71	19.11	28.04

* Total includes Residential, Commercial, Industrial and Street Lighting.
Source: T&TEC

Figure 6.6 below shows the average tariff per kWh (in 2021) for selected countries in the Caribbean region.[20] These average tariffs were derived using kWh sold and revenue from electricity sales across the various countries and are, therefore, not specific to any customer class but relate to average prices in the countries listed. The analysis reveals that only Suriname, at US$ 0.016, has a lower average tariff than Trinidad and Tobago at US$0.052/kWh.

Figure 6.6: Regional Average Electricity Tariffs (USD)



Data obtained from various sources. Figure prepared by the RIC

[20] It should be noted that comparison of electricity prices across countries is sensitive to the different tariff schemes applied in each country and there can be significant variances (sometimes obscured) depending on fuel charges, width of rate blocks and other factors.

7 OPERATING EXPENDITURE

7.1 INTRODUCTION

Operating expenditure (Opex) covers the typical costs of running the utility and includes all staff costs, repairs and maintenance, generation, fuel and overhead costs. In conducting PRE2, one of the key objectives was to ensure that only the efficient costs of providing services were passed through into tariffs and overall prices. The allowance of only efficient levels of Opex was, therefore, a key concern for the RIC as it accounted for approximately 90% of the overall revenue requirement.

The RIC determined the efficient level of operating and maintenance costs that T&TEC would incur in PRE2 by benchmarking the forecast Opex provided by T&TEC in its Business Plan against suitable comparators[21], and considered the potential for T&TEC to make efficiency improvements. The RIC also carefully considered the ability of T&TEC to fund its operational activities and to provide reliable and quality services to customers.

7.2 OPEX REVIEW PROCESS

The RIC's expenditure review process involved the following stages:

- **Set-up stage** – the preparation of the document, "**Information Requirements: Business Plan 2021-2026"** to provide guidance to T&TEC on the information requirements for the price review, inclusive of the specific requirements for Opex. T&TEC was required to provide details of actual expenditure between 2015 and 2020 and forecast Opex, together with supporting explanations and other relevant information. The requested Opex forecasts included base operating and maintenance costs, costs associated with growth in demand and costs arising from new or changed functions/obligations referred to as step changes.

[21] When benchmarking was employed, cognisance was taken of the differences between jurisdictions and the local context to ensure that there was merit in the comparison and to give consideration to T&TEC's specific operating circumstances.

- **Facilitation stage** – where the RIC provided advice, as required, to T&TEC to ensure that the data to be submitted was consistent with the requirements of the Business Plan. During this process, the RIC identified a range of issues, including deficiencies and inconsistencies in the information. Eliminating these deficiencies and inconsistencies proved to be a protracted process, as supporting information had to be sourced to ensure that the expenditure forecasts were internally consistent and reconcilable with the information submitted.

- **Assessment stage** – where the data was assessed to ensure that expenditure reflected the efficient cost of service provision. In doing so, the RIC also compared the various elements of cost of supply with the norms applicable to the industry.

7.3 OVERALL APPROACH TO ASSESSING OPEX

The RIC's objective was to determine a reasonable allowance for operating costs. This is usually a level of costs that can realistically be expected to be incurred if the entity is run efficiently within the constraints it faces. In assessing reasonable Opex, the RIC utilised the following process/steps:

- determining the baseline operating costs;
- reducing baseline costs through efficiencies; and
- specifying a generalised efficiency factor for the reduction of forecast (allowed) costs for future "unidentified" efficiencies.

Sections 7.3.1 to 7.3.3 which follow give a brief overview of these processes; the specific details relevant to PRE2 are discussed later in the chapter.

7.3.1 Determining Baseline Opex

The baseline reflects the normal operating costs of the service provider from which it is possible to assess the impact of future cost changes. The assessment of Opex begins with an in-depth assessment of the service provider's reported actual expenditure, as provided in its audited financial statements, in a base year.[22] One-off costs that are considered to be atypical of the service provider's normal Opex are removed. In the case of T&TEC, the assessed baseline also excludes generation and fuel costs, which are based on contractual arrangements and, therefore, largely outside of T&TEC's control.

The RIC's assessment of normalised baseline costs separates Opex into categories[23] and seeks justification from the service provider, where necessary. This is undertaken by analysing expenditure by function, that is, the cost to provide a particular service, and by activity, that is, the cost of each activity comprising a service, as appropriate. The RIC also identifies particular significant cost items where it determines that a more detailed review would be instructive. The assessment also considers to what extent the initial results should be adjusted to take account of any special factors that may have been relevant to the service provider.

These normalised costs are then updated to year *t* (starting year) to allow for subsequent developments, including:

- costs being disallowed, if it can be demonstrated that they were imprudently, inefficiently or unnecessarily incurred;
- additional costs (step changes), arising out of new obligations/commitments; and
- inflation, demand growth and other trends in costs.

7.3.2 Assessed Scope for Efficiencies – Reducing Baseline Costs

The RIC also considers wider information, and identifies cost items where it is of the view that comparison with other utilities[24] would be useful. To this end, T&TEC's overtime expenditure, absenteeism rate, etc. were compared to similar utilities in other developing countries. The RIC understands that while benchmarking can be a powerful tool, it requires accurate information and careful interpretation. Further, acceptable benchmarking requires comparisons to be like-

[22] The base year for the price review for which full information is available, that is, the starting point for setting forward allowances.
[23] This is sometimes referred to as a "bottom up" approach.
[24] This is sometimes referred to as a "top down" approach.

for-like. Thus, the RIC, recognised circumstances where it was appropriate to adjust costs to account for local factors and to account for uncertainties in the comparisons.

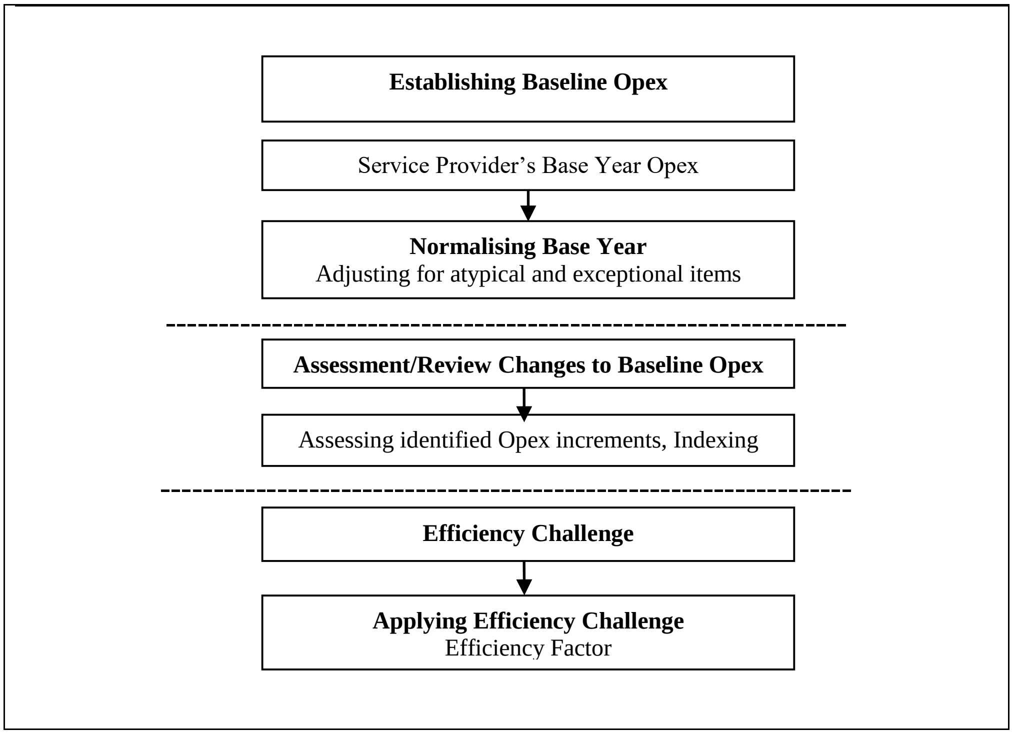
7.3.3 Specification of Generalised Efficiency Factor

Apart from specific reductions to individual items undertaken because of bottom-up and top-down analysis, the RIC believes that the service provider should be able to make further efficiency savings within the regulatory control period. These efficiency savings are not separated by line item, rather they represent a reduction in the overall revenue for Opex costs. It is the service provider that determines how these reductions in Opex are to be achieved across the various line items.

The RIC utilised a generalised efficiency factor to reflect those reductions that T&TEC is expected to achieve in its cost-of-service provision and hence in prices for services. This efficiency target is based on the concept that T&TEC should continue to improve its efficiency through innovation and the introduction of new technologies, as happens in other sectors of the economy. The RIC utilised the "rate of change" as one of the techniques for arriving at these efficiencies. The rate of change is the year-to-year change in Opex for several factors such as, expected productivity improvements in labour and other costs. The rate was established by examining the productivity achieved by T&TEC for a number of past years and thereafter, calculating future cost reductions on the assumption that at least the same rate of change (i.e. productivity improvement) will continue in the future. This potential to achieve efficiency gains was also reflected in the RIC's decisions for the first control period. The RIC decided that an Opex efficiency target of 2% per annum is appropriate for PRE2 based on the historical performance of T&TEC and what the RIC judged to be achievable.

The RIC's current approach to setting the allowed level of efficient Opex is depicted in Figure 7.1 below. A detailed discussion of the approach can be found in the document, **"Approach to Setting Operating Expenditure"**, (March 2022).

Figure 7.1: RIC's Current Approach to Setting Opex



7.4 REVIEW OF OPEX OUTTURN

7.4.1 Introduction

This section examines the historical Opex undertaken by T&TEC over PRE1. The outturn was assessed and compared with the allowed Opex by the RIC for the period. The *ex-post* assessment of Opex is utilised to inform the setting of Opex allowances for the next control period, as opposed to Capex where the intent would typically be to claw back expenditure from the previous control period. Therefore, the main objective of the review of T&TEC's historical Opex was to assess whether T&TEC's Opex had been incurred efficiently while delivering the expected benefits for customers. This review of historical Opex was also used, to some extent, in the RIC's determination of the appropriate allowed Opex for PRE2.

7.4.2 Overview of Historical Opex

The RIC provided a detailed comparison of T&TEC's actual Opex to RIC's allowed, for PRE1 in the RIC document, **"Approach to Setting Operating Expenditure"** as well as in the **Draft**

Determination. Table 7.1 below provides a high-level summary of Opex, for the period June 2006–May 2011 according to the major line items: Conversion; Fuel; Labour; Transmission and Distribution (T&D); Repairs & Maintenance and Other T&D Expenses; and Administration and General. Actual expenditure was $601.67 million higher than approved.

Table 7.1: Analysis of Actual Opex by Major Categories

Opex Item	June 2006 - May 2007	June 2007 - May 2008	June 2008 - May 2009	June 2009 - May 2010	June 2010 - May 2011	Total	Difference Actual – Approved	Variance[25]
Conversion:								
RIC Approved	792.66	844.08	1,050.27	1192.87	1391.51	5,271.39		
T&TEC Actual	807.85	932.06	942.38	943.05	878.69	4,504.03	-767.36	-17.04%
Fuel:								
RIC Approved	584.1	609.4	651	671.5	716	3,232.00		
T&TEC Actual	557.34	583.52	635.94	725.34	732.91	3,309.08	77.08	2.33%
Labour:								
RIC Approved	273.61	287.3	301.65	316.72	332.54	1,511.82		
T&TEC Actual	337.44	355.4	363.65	494.62	528.36	2,079.47	567.65	27.30%
T&D Repair, Maintenance and Other T&D Expenses:								
RIC Approved	233.83	245.49	257.53	270.43	280.97	1,288.25		
T&TEC Actual	254.18	264.42	314.87	493.33	404.69	1,731.49	443.24	25.60%
Administration & General:								
RIC Approved	134.35	137.91	140.71	144.24	147.38	704.59		
T&TEC Actual	172.53	449.99	223.47	186.22	310.39	1,053.01	348.42	33.09%
Total Expenditure:								
RIC Approved	1,796.00	1,892.34	2,166.40	2,353.35	2,617.71	10,825.80		
T&TEC Actual	1,963.27	2,175.82	2,191.06	2,711.94	2,385.38	11,427.47	601.67	5.27%

Calculated by the RIC

Notes:

Total Expenditure includes other expenditure not shown, including depreciation.

[25] These percentages measure errors in the forecast (RIC approved) and are given as:
$$\frac{(Actual\ Opex - Forecast\ Opex) \times 100}{Actual\ Opex}$$

7.4.3 Lag Period (2012–2020)[26]

PRE1 ended on May 31, 2011, and hitherto the RIC has not completed a second price review, hence there was no allowed (as per an approved revenue requirement) Opex for the period that followed (lag period of 2012-2020). T&TEC's Opex over the lag period is shown in Table 7.2, and the composition of these costs is shown in Figure 7.2. A detailed discussion was provided in the **Draft Determination (January 2023)**.

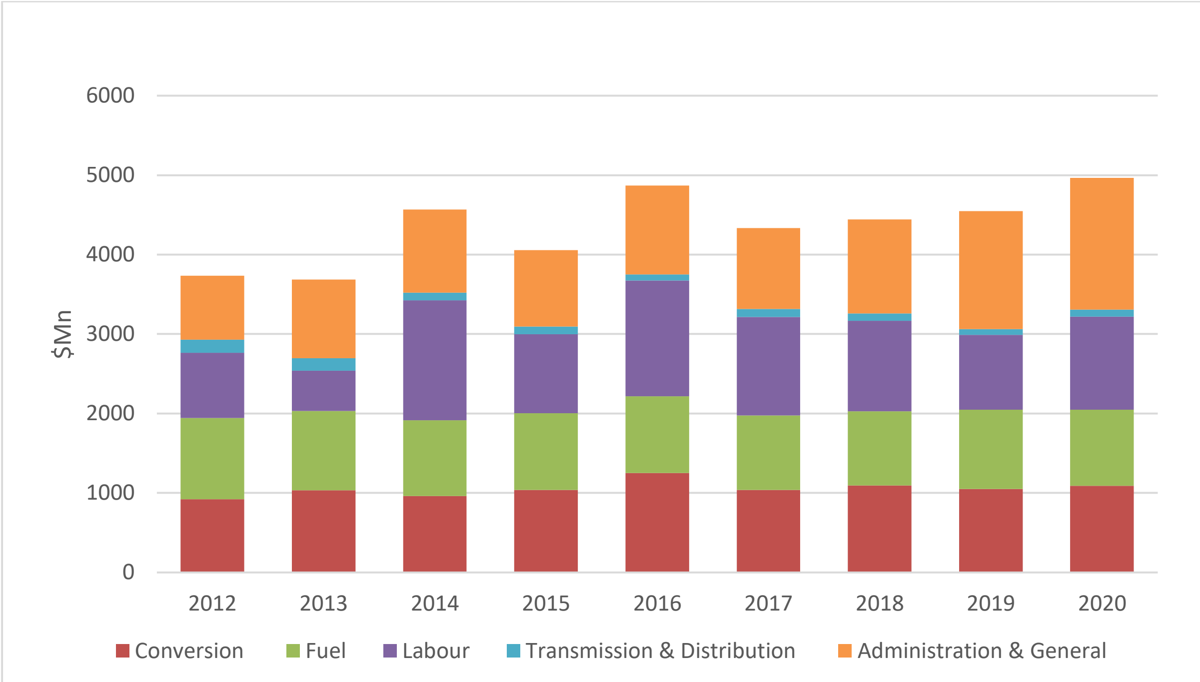
Table 7.2: Actual Opex by Major Categories, 2012–2020

	2012 $Million	2013 $Million	2014 $Million	2015 $Million	2016 $Million	2017 $Million	2018 $Million	2019 $Million	2020 $Million
Conversion	922.92	1,033.12	959.53	1,038.34	1,251.67	1,036.87	1,093.21	1,051.40	1,090.48
Fuel	1,020.55	1,000.26	956.55	967.21	967.14	938.63	933.70	995.58	958.65
Labour	821.03	504.42	1,509.63	994.24	1,454.95	1,241.59	1,141.56	942.18	1,170.39
Transmission & Distribution	163.04	158.24	93.56	94.28	77.19	98.85	92.80	74.17	88.04
Administration & General	807.88	988.08	1,048.57	960.60	1,118.68	1,018.00	1,183.07	1,482.83	1,657.75
Total	**3,734.72**	**3,684.12**	**4,567.84**	**4,054.67**	**4,869.63**	**4,333.94**	**4,444.34**	**4,546.16**	**4,965.31**

Source: T&TEC

[26] The lag period is 2012 to 2022; however, for the purposes of this exercise, the lag was assessed up to 2020.

Figure 7.2: Changes in the Composition of Opex 2012–2020



Source: RIC

7.5 REVIEW OF FORECAST OPEX

7.5.1 Introduction

The assessment of T&TEC's forecast Opex involved an examination of its proposed forecast expenditure. The RIC undertook bottom-up analysis and top-down/benchmarking analysis, where appropriate, and considered the potential for T&TEC to make efficiency gains. The sections below set out assessments of T&TEC's:

- baseline operating and maintenance costs;
- scope to reduce baseline costs through efficiencies;
- scope to improve the level of service performance; and
- level of allowed Opex for PRE2.

7.5.2 Assessment of Forecast Opex

7.5.2.1 Baseline Costs

The assessment of the Opex to be allowed for PRE2 included:

- the assessment of T&TEC's baseline Opex in 2020 (the base year for the second price review);
- a review of the Opex incurred in the prior five-year period;
- a review of T&TEC's PRE1 costs;
- a review of T&TEC's forecasts and supporting submissions for PRE2 (taking into account its historic accuracy of forecasting of line items); and
- assessment of responses provided by T&TEC to queries posed by the RIC.

In the assessment, the impacts of one-off costs and other atypical items of normal operating costs, were removed. Additions/increases to normal baseline Opex were scrutinised, and necessary changes reflected. The assessment of baseline costs also took account of potential changes in Opex during the control period that the RIC considered to be outside of T&TEC's control. The assessment, at this stage, did not take account of future improvements in efficiency, as these were considered separately. T&TEC's proposed forecast of operating expenditure (Transmission & Distribution, Administrative & General related only) amounted to $6,663.11 million over the second period, 2023-2027, as shown in Table 7.3 below.

Table 7.3: T&TEC's Projected Opex Expenditure for 2023–2027 ($Million)*

	2023	2024	2025	2026	2027	Total
Transmission & Distribution	582.62	938.54	585.20	1,188.26	614.97	3,909.59
Administrative & General	523.01	632.28	396.34	791.58	410.31	2,753.52
Total	**1,105.63**	**1,570.82**	**981.54**	**1,979.84**	**1,025.28**	**6,663.11**

*** Conversion and Fuel costs not included**

Source: T&TEC

T&TEC estimated that there would be significant increases in its Opex compared to the previous five-year period. These increases were projected in a number of areas and were influenced by the following objectives:

- maintenance of ageing plant;
- satisfying customer demands and expectations;
- reducing the number of planned outages and increasing hotline work;
- restructuring of vegetation management; and
- introduction of new materials to improve public safety.

The RIC did not fully accept T&TEC's forecasts and formed its own assessment. The RIC's allowance is considerably less than T&TEC's projections. The main areas which received close scrutiny from the RIC are discussed below.

7.5.2.2 Payroll Costs

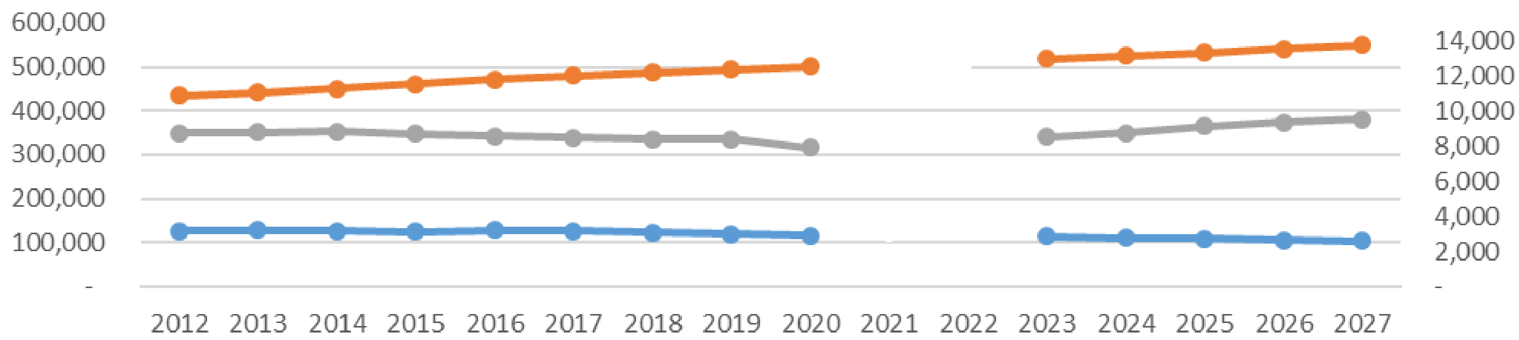
The assessment of payroll costs includes the benchmarking of wages, salaries, overtime and employee-related benefits. Employee costs are a function of the number of employees and the level of wages and salaries. Employee costs account for almost 85% of the total Opex (excluding conversion and fuel costs) during PRE2.

Figure 7.3 presents a comparison of annual increases in staff levels, number of customers and sales of energy for the period 2012–2020, and a projection for the period 2023–2027.[27]

- Staff levels decreased by 7.5% for the period 2012–2020 and are forecast to decrease by about 7.2% during 2023–2027;
- Number of customers increased by 15.5% between 2012 and 2020 and is projected to increase by 6.3% between 2023 and 2027; and
- Actual sales of energy decreased by 9.2% between 2012 and 2020 and are projected to increase by 11.8% between 2023 and 2027.

[27] Customer numbers and sales presented up until 2020, the base-year for PRE2.

Figure 7.3: Actual and Forecasts of Staff Levels, Customer Numbers and Energy Sales as submitted by T&TEC, 2012–2027



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2023	2024	2025	2026	2027
Number of Customers	433,940	442,100	450,775	461,733	470,541	479,687	487,314	494,022	501,370	516,652	524,820	532,988	541,157	549,396
Number of employees	3,137	3,200	3,172	3,129	3,174	3,148	3,071	2,991	2,903	2,792	2,742	2,694	2,640	2,592
Energy Sales (GWh)	8,714	8,767	8,820	8,669	8,545	8,463	8,402	8,405	7,908	8,525	8,727	9,126	9,325	9,531

Prepared by the RIC

T&TEC projected that salaries and wages per employee will grow by 4.7% between the period 2023 and 2027. The request for wages and salaries comprised 64.9% of total payroll costs, with overtime and employee benefits accounting for 7.4% and 27.7%, respectively.

In its analysis and assessment of payroll costs, the RIC utilised the adjusted average of salary per employee over the period 2023–2027, forecast employee numbers over the PRE2 period and estimated a 2% increase in salaries and wages annually for PRE2. The 2% estimate took into account the current economic situation in the country as well as the fact that T&TEC's employees were awarded a 10% increase for the period 2012–2014. Additionally, consistent with the historical figures, the RIC assumed an efficient recurring level of overtime of 7% and efficient recurring level of sickness and absenteeism of 3.7%. **The RIC expects T&TEC to adhere to these targets and any variation from these may lead to revenue adjustments at the beginning of the third control period (PRE3)**.

The RIC also examined T&TEC's labour efficiency, as it relates to the composition of its crew sizes. Further details are provided in the Appendix to this chapter. The RIC has noted that the typical crew size for several electric utilities in the United States is two (2). The crew foreman is required to operate the utility's vehicle. In other Caribbean jurisdictions, the linesman must have an appropriate heavy-duty drivers' permit by the completion of his/her probation period, which then enables him/her to operate the service vehicle. This eliminates the need for a designated driver within T&D job crews.

The RIC's view is that T&TEC should conduct the requisite cost/benefit analyses, while being cognisant of relevant safety considerations, as it seeks to improve its productivity by re-examining the size and composition of its linesman crews and the equipment in use. The RIC is aware that the configuration of crews is subject to agreements with its unions, but expects T&TEC to examine its options for achieving productivity gains through rationalisation of its linesman crews, inclusive of the elimination of the position of a designated driver and considering its equipment in use.

To ensure that customers do not continue to pay for any inefficiencies, the RIC has not included the cost of designated drivers into allowed Opex from the third year of the regulatory control period. The RIC has also included an overall efficiency adjustment of 1.5% to the overall cost allocated to maintenance crews from year three.

T&TEC is, therefore, required to submit a detailed report to the RIC, within 18 months of the publication of the Final Determination for PRE2, indicating what steps had been considered and what are proposed to improve efficiency with respect to the size and composition of its T&D crews and the equipment in use. T&TEC must also outline the changes to be made in the future regarding the composition of linesman crews for typical construction and maintenance jobs of the utility.

Stakeholder Comments and Final Decision

T&TEC, as part of its comments on the Draft Determination, indicated that two hundred and fifty (250) temporary employees had been made permanent and requested a further $8.5 million be added to overall payroll costs. The RIC considered the request and included same into the allowed Employee Costs. T&TEC also queried the amounts allowed for "employee-related costs", but no cogent arguments were presented to warrant the RIC adopting a different approach. The RIC's treatment is in accordance with the principles articulated in the RIC's paper "Treatment of Pension Costs". T&TEC was in agreement with the RIC's proposal to phase-out the cost associated with dedicated drivers on crews. T&TEC was seeking to accomplish the phase-out but noted that it was constrained by decisions of the Industrial Court of Trinidad and Tobago. However, T&TEC has proposed the implementation of the position of Driver/Craftsman, which they had indicated was before the Industrial Court and was for Hearing in July 2023.[28] The RIC has noted T&TEC's comments, but maintains its original position.

[28] The matter was heard by the Industrial Court over the period July 3-7, 2023, and is reserved for judgement.

On the basis of the above discussion, the RIC has approved the following as employee costs for the years 2023–2027 (Table 7.4). Overall, it is expected that payroll costs will decrease by 2.8% over the period 2023–2027, provided that T&TEC achieves efficiencies.

Table 7.4: Requested and RIC's Allowed Employee Costs, 2023–2027 ($Million)

	T&TEC Requested	RIC Approved	2023	2024	2025	2026	2027
Wages	1,789.92	1,372.05	293.62	303.58	282.81	258.97	233.07
Salaries	1,726.61	2,148.27	408.08	423.33	434.73	440.56	441.57
Overtime	402.05	246.42	49.12	50.88	50.23	48.97	47.22
NIS	0	213.20	42.50	44.02	43.46	42.36	40.86
Employee Related	1,545.58	429.17	81.95	84.70	86.75	87.80	87.97
Charged to Revenue	5,464.16	4,409.11	875.27	906.51	897.98	878.66	850.69

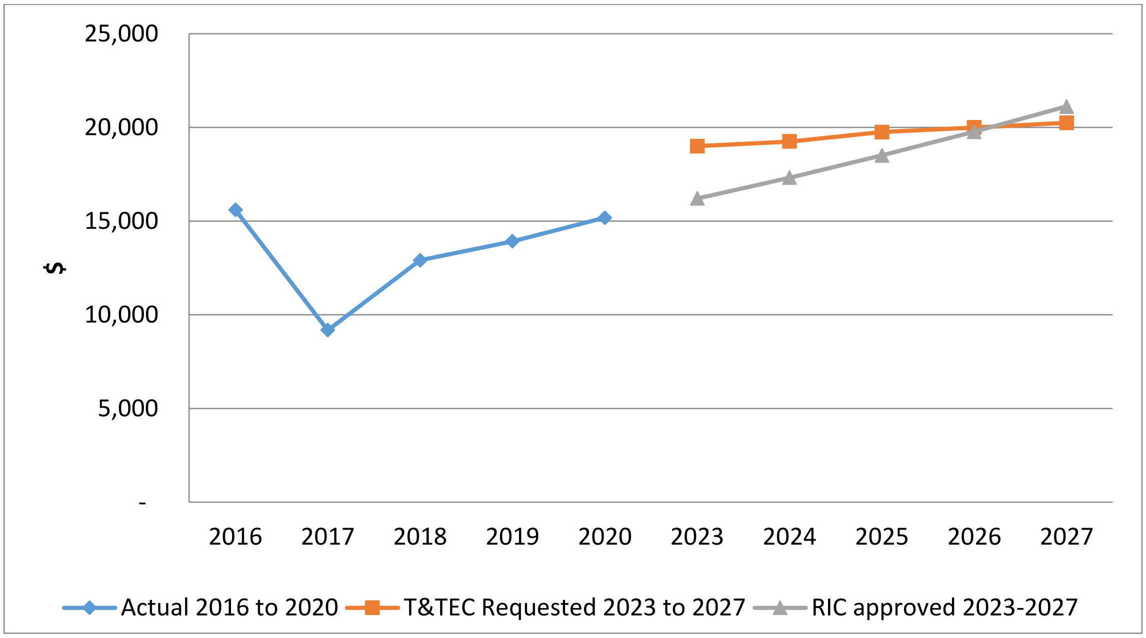
The RIC's final decision is to allow Employee Costs as detailed in Table 7.4. T&TEC must adhere to the targets related to overtime, sick leave and absenteeism. Any variation from these may lead to revenue adjustments at the beginning of the third control period (PRE3). The RIC understands that the matter of the role of the drivers is before the Industrial Court, but for regulatory purposes, T&TEC must submit a detailed report to the RIC, within 18 months of the publication of the Final Determination for PRE2, which must indicate the steps that have been considered and whatever measures are proposed to improve efficiency with respect to the size and composition of its T&D crews and any changes to its equipment. T&TEC must also outline the future changes regarding the composition of linesman crews for typical construction and maintenance jobs of the utility.

7.5.2.3 Rates, Taxes and Insurances

This expense item mainly consists of land taxes paid by T&TEC for property owned, such as offices, substations and any parcel of land owned and utilised for the transmission and distribution of electricity. The baseline for this item was determined from historical trends in capital expenditure over the period 2016 to 2020. The average increases in rates, taxes and insurance over PRE2 is projected to be 30.2%.

Figure 7.4 shows T&TEC's Actual expense (2016 to 2020) and forecasts for the period under review. The RIC's allowed expenditure for PRE2 will provide T&TEC with the necessary funding to cover its rates, taxes and insurance, as this category of expenditure fluctuates according to any land purchases made by T&TEC or legislative changes to adjust land taxes in the country.

Figure 7.4: Rates, Taxes and Insurance Expenditure ($'000)

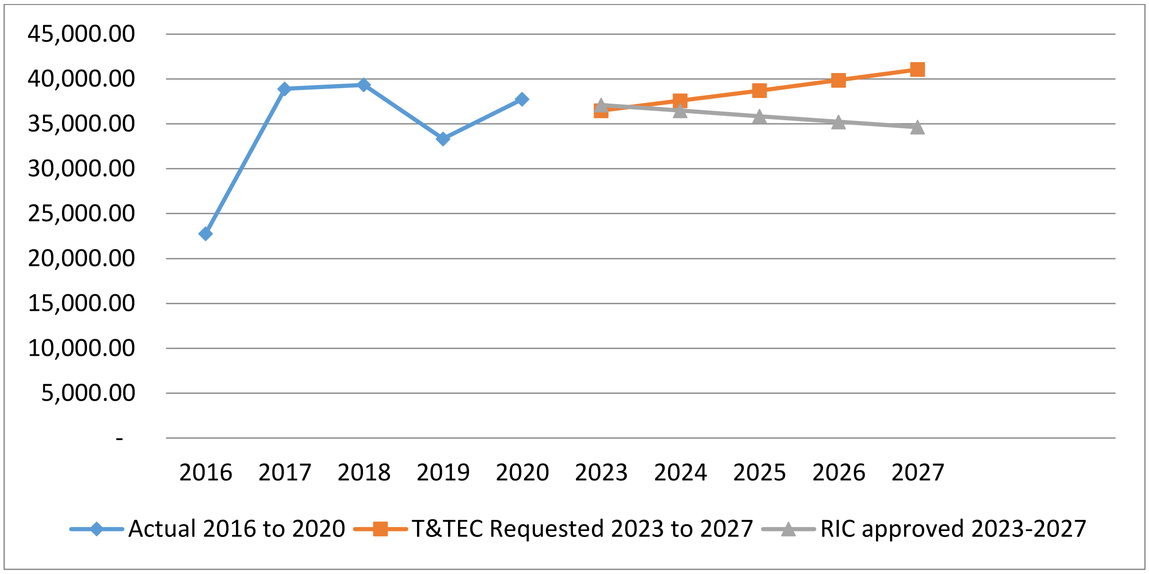


Calculated by the RIC

7.5.2.4 Materials

This expense mainly consists of consumables utilised by T&TEC to carry out typical business activity. The baseline expenditure was determined using historical trends, projected growth in employees and business activity. It is expected that this expense will decrease by 6.7% over the control period 2023 to 2027 (Figure 7.5).

Figure 7.5: Materials Expenditure, 2023–2027 ($'000)



Calculated by the RIC

7.5.2.5 Services/Maintenance

The expenditure under this category is used to carry out preventative maintenance and restore damaged items used in the transmission and distribution of electricity. The planned expenditure submitted by T&TEC was not supported by any specific plans. However, the RIC has approved an amount of $558.9 million for the period 2023–2027 (Table 7.5) utilising generally accepted benchmarks. The RIC has allowed 1.5% of gross fixed assets for transmission assets and 2.5% of gross fixed assets for distribution assets as maintenance expenditure. Adequate expenditure for this category will lead to enhanced performance of the network system overall, as well as directly impact on the reduction of consumer complaints in the areas of damaged appliances, outages and low voltage problems.

Final Decision

The RIC received no dissenting views on this issue.

The RIC's decision is that T&TEC must submit its actual expenditure in this category annually.

<u>Table 7.5: RIC's Allowed Maintenance Expenditure ($Million)</u>

	2023	2024	2025	2026	2027	Total
Transmission Maintenance	13.50	14.37	15.05	15.61	15.78	74.31
Distribution Maintenance	90.67	95.13	96.94	99.13	102.73	484.60
Total	**104.17**	**109.50**	**111.99**	**114.74**	**118.51**	**558.91**

7.5.2.6 Advertising and Marketing/Sponsorship

T&TEC regularly undertakes various forms of community sponsorship, supports its sports club and engages in brand marketing. The RIC understands T&TEC's sports and cultural sponsorship and its need to continue to fulfil its corporate social responsibility. In the circumstances, the RIC encourages T&TEC to pursue the decisions which will enable it to fund these programmes out of the surpluses it has earned from efficiency improvements. **Therefore, the RIC has disallowed from the revenue requirement, costs in this area in the amount of $6.73 million for PRE2.**

7.5.2.7 Prescriptive Annual Targets and the Level of Allowed T&D Opex

Regulators use different techniques to benchmark Opex against other utilities, but it is always difficult to benchmark in the absence of local and/or regional comparators. The benchmarking process requires not only accurate information and like-for-like comparisons, but the results require careful interpretation. Despite these difficulties, benchmarking still provides a useful check to ensure that Opex allowance approved by the RIC is efficient and consistent with international comparators. In this regard, **T&TEC was required in the Draft Determination to undertake a study of Opex cost efficiency and present the report to the RIC within 30 months of the publication of the Final Determination**. Some of the areas that should be included in the study are:

- unit cost of faults per km;
- unit cost of tree-cutting; and
- non-network Opex cost per unit.

The figures provided in Table 7.6 reflect the specific reductions related to the individual categories of expenditure. However, the RIC believes that T&TEC should be able to make further efficiency savings of 2% annually during the period 2023 to 2027. These savings reflect annual productivity improvements and have not been separated by category. It is a reduction in the overall revenue associated with operating costs and has been included within the approved revenue detailed in Chapter 11. It will be left to T&TEC to determine how these reductions in Opex will be achieved across the various line items.

Table 7.6: Requested and RIC's Allowed T&D Opex, 2023–2027($Million)

	T&TEC Requested	**RIC Approved**	**2023**	**2024**	**2025**	**2026**	**2027**
Labour Cost	5,464.16	4,409.11	875.27	906.51	897.98	878.66	850.69
Rates, Taxes and Insurances	98.25	92.92	16.21	17.32	18.50	19.77	21.12
Materials	193.69	179.29	37.10	36.47	35.85	35.24	34.63
Maintenance /Services	885.28	558.91	104.17	109.50	111.99	114.74	118.51
Rents	21.73	21.73	4.10	4.21	4.34	4.47	4.61
Subtotal	6,663.11	5,261.96	1,036.85	1,074.01	1,068.66	1,052.88	1,029.57
Less Promotional Cost	0	6.73	2.43	1.01	0.98	1.11	1.20
Total T&D before Efficiency Savings	6,663.11	5,254.39	1,034.42	1,073.00	1,067.68	1,051.77	1,028.37
Less Efficiency Savings (2% per annum)	0	104.26	20.69	21.46	21.35	21.04	20.57
Total Approved T&D Expense	6,663.11	5,150.13	1,013.73	1,051.54	1,046.33	1,030.73	1,007.80

Stakeholder Comments and Final Decision

In response to the Draft Determination, a few commenters queried whether the RIC had conducted studies of economy and efficiency of operation as required under its Act.

In this regard, the RIC agrees that its Act makes provision for the conduct of studies of efficiency and economy of operation and of performance under Section 6 (d). However, evaluating efficiency is inherent in the building block approach, which is being utilised in PRE2 to establish forecasts of allowed revenue. The outcome of the RIC's evaluation of efficiency of T&TEC’s forecast of expenditure was documented in the Draft Determination.

T&TEC also queried the requirements of the Opex cost efficiency study which must be undertaken 30 months after the publication of the Final Determination. The RIC will hold discussions on this prior to the conduct of the study.

The RIC considers that the level of allowed Opex in Table 7.6 is adequate and should enable T&TEC sufficient scope to outperform the targets over the regulatory control period.

The RIC’s final decision is that T&TEC must undertake a study of Opex cost efficiency and present the report to the RIC within 30 months of the publication of the Final Determination. The allowed level of T&D Opex is shown in Table 7.6.

7.5.2.8 Conversion Costs

Two of the major cost components of T&TEC are the cost of power (conversion cost) and fuel cost, comprising approximately 75.2% of T&TEC’s total Opex. Conversion and fuel costs are considered uncontrollable costs, that is, costs over which the actions of the utility have little or no effect, hence they are generally treated as pass-through. These costs are also subject to long-term contractual agreements (Power Purchase Agreements).

On the basis of its assessment of growth in demand, T&TEC submitted forecasts for conversion costs from all the generators. In the case of conventional generation this comprises both capacity and energy payments. The generation coming from the proposed Solar photovoltaic (PV) plants comprise energy payments only. In the Draft Determination, the RIC’s view was to allow a **98% pass-through of capacity payments and 100% pass-through on the energy component of conversion costs**

for PRE2. With respect to the solar PV plants, the RIC had noted that it anticipated that these would be operational from 2025 and provided for energy payments accordingly. The RIC also noted that it expected to monitor these costs closely and make necessary adjustments at the time of its Annual Tariff Adjustment if the Solar PV plants were not commissioned as anticipated.

Stakeholder Comments and Final Decision

There were a number of concerns raised with respect to the independent power producers (IPPs) inclusive of the following:

- **A number of respondents expressed concern with the "take or pay" contract provisions of the existing PPAs and its impact on the finances of T&TEC, as well as the belief that the PPAs reflected inefficient costs. They felt that rate-payers were being asked to pay for "excess capacity", with at least one commentator accusing the RIC of violating the principle of "used" and "useful**".

  While the RIC acknowledges the concern expressed, the matters relate to the Generation Sector, and this Price Review is concerned with the Transmission and Distribution Sector. Regulators when conducting price reviews, treat generation costs (conversion and fuel) as uncontrollable and typically pass through 100% of such costs. Notwithstanding this, the RIC had explored this issue at length in PRE1 and acknowledged that the scope for reducing the cost of conversion was limited, given the existing terms of both PPAs (at the time TGU did not exist), but had decided not to pass-through 100% of these costs. At that time the RIC allowed 98% of conversion costs to pass-through into rates. Fuel costs was treated separately as T&TEC is responsible for sourcing fuel under the terms of the relevant PPAs.

  The cost of conversion comprises capacity and energy payments. The contracted generation capacity[29] is by necessity greater than the country's peak demand (the

[29] The contracted generation capacity is the sum of the capacities of each generating machine, de-rated due to age and other factors, at the four power stations of the IPPs.

highest instantaneous demand by all customers) to ensure that there is a level of reliability which allows for rapid recovery, should any portion of the generation capacity that is supplying electricity be unexpectedly lost. In addition, there is need for capacity during periods of planned maintenance when some machines are not available to the system. Notwithstanding this, the RIC has looked at this issue in detail and recognises that while T&TEC pays for available capacity (which may be lower or equal to contracted capacity) this has often exceeded peak demand (plus the requisite spinning reserve). The RIC also recognises that no system is built to meet the specific needs of its customers at one point in time, but to cater for growth in demand over a period of time. The RIC has sought to balance the interests of consumers with those of the utility by allowing less than 100% of these costs to pass through to customers given the uncontrollable nature of these costs and considers that a reasonable balance has been struck. Further, T&TEC only pays for energy produced by the generators to meet the instantaneous demand on the system, no extra energy is produced that is not needed.

The concept of "used and useful", as discussed in the Draft Determination, applies to the assets of T&TEC, specifically what is to be included in the rate base for price-setting purposes and not to generation costs. The respondent's use of the term "used and useful" implies that generation costs associated with unused generation capacity should, in essence, be stranded. The stranding of generation assets is a matter that is not undertaken lightly, and, in many countries, this is discussed as part of sector reform and restructuring as it can adversely impact investor confidence. It is not a matter that can be treated within a Price Review for the transmission and distribution sector.

- **T&TEC has insisted that the RIC, by allowing 100% of the energy payments to the IPPs, has deemed the generator's operating costs efficient and, by not allowing 100% of this major uncontrollable cost (capacity**

payments) to pass-through into tariffs, then the tariffs are not cost reflective.

The RIC has considered this argument, and agrees that generation costs are largely an uncontrollable cost to the transmission and distribution utility. On the other hand, the RIC notes that "take or pay" contracts transfer a significant amount of risk to the off-taker (in this case T&TEC) and these contracts need to be carefully considered as generally prices paid under PPAs would deviate from those in a competitive market. The RIC, therefore, stands by its decision to allow 98% pass-through of capacity payments.

- **Some commenters were of the view that the RIC should mandate efficiency requirements for the generators and that new generation plants be built to replace old, less efficient plants**.

  The RIC has recently introduced a Quality of Service Scheme for Electricity Generating Entities in Trinidad and Tobago, which is expected to bring public awareness and scrutiny to the performance of the sector through the publication of reports. This scheme is intended to contribute to the promotion of economic efficiency, reliability and transparency within the sector.

  The RIC's regulatory functions are guided by its legislative remit and it has no legislative powers to direct the expansion of generation capacity. The RIC notes that there is a draft Integrated Resource and Resilience Plan (IRRP) for Trinidad and Tobago and its finalisation should provide direction on the procurement of new generation.

- **Concerns were raised with respect to the licensing arrangements for the sector, inclusive of the exemption of the Trinidad Generation Unlimited (TGU). One respondent called for the reintegration of the sector under the ambit of T&TEC**.

  The RIC has noted the concern but wishes to advise that the award of licences falls under the remit of the Minister.[30] The RIC's role in this regard is to provide advice to the Minister upon receipt of a licence application. Notwithstanding,

[30] The RIC's line Minister is the Minister of Public Utilities.

> Section 38 of the RIC Act allows the Minister to grant an exemption to an entity from the requirements of the RIC Act, thus affording the provision of generation without a licence. However, the RIC has in the past written to the Ministry of Public Utilities (MPU) for TGU to be placed under the ambit of the RIC. Any restructuring of the sector rests with the Government, but the RIC is not averse to providing its views on these areas.

Many commentators also strongly advocated for the Government to allow members of the public to generate renewable energy (RE) and connect to the grid. While the RIC understands the concerns, the promotion of RE requires the appropriate policy, legislative and regulatory framework and incentives to be set by the Government, which lies beyond the ambit of this Price Review. It is expected that the Government will finalise a Feed-in-Tariff Policy within the coming months, which will allow customers (up to a specific size) to sell renewable energy to the grid. Notwithstanding, the RIC has proposed various actions for consideration to enable the transition to renewable energy in Trinidad and Tobago in the staff paper **"Towards Renewable Energy Deployment in the Electricity Sector of Trinidad and Tobago"** published in 2019.

T&TEC has also advised that the purchase price of energy from the two Solar PV plants has increased owing to higher construction costs, and the additional cost has been included in the allowed conversion costs.

Table 7.7 shows the conversion costs projected by T&TEC, inclusive of the revised solar costs and the application of the RIC's allowance of those costs.

Table 7.7: Allowed Conversion Costs, 2023–2027($Million)

	Capacity Cost		Energy Cost			Total Conversion Cost	
Year	**T&TEC's Requested**	**98% RIC Allowed**	**Traditional IPP**	**Solar PV**	**Total (100% RIC Allowed)**	**T&TEC's Requested**	**RIC Allowed**
2023	1,764	1,729	36	0	36	1,800	1,765
2024	1,787	1,752	37	0	37	1,824	1,788
2025	1,816	1,780	38	119	157	1,973	1,937
2026	1,835	1,798	39	121	160	1,995	1,958
2027	1,860	1,823	40	121	161	2,021	1,984
Total	**9,062**	**8,882**	**190**	**361**	**551**	**9,613**	**9,432**

Calculated by the RIC

Note: The projected Contracted Capacity for 2023–2027 is 1,754 MW. T&TEC pays for Available Capacity which may be less than or equal to the Contracted Capacity, depending on the availability of the generating machines at the IPPs.

The RIC's decision is to use the allowed conversion costs shown in Table 7.7

7.5.2.9 Fuel Costs

Under the terms of the Power Purchase Agreements (PPAs), T&TEC has to pay for the fuel that is converted into electricity by the generators. T&TEC buys fuel from the National Gas Company (NGC) at a pre-determined price that is influenced by the Government. The RIC has used a fuel price in keeping with T&TEC's assumption in its Business Plan[31] (T&TEC has indicated it is based on guidance it has confirmed it has received from the Government) and an escalation factor of 3% per annum in its revenue calculation.

T&TEC's fuel costs are dependent on the unit price paid for the fuel and the volume of fuel consumed in the generation of electricity. The volume of fuel consumed depends on both the demand for electricity and the efficiency of the conversion of the fuel to electricity. The heat rate is a measure of the thermal efficiency of a generation plant to convert fuel into electricity. It is the amount of heat supplied (from the fuel source) per

[31] The RIC and T&TEC have to comply with Government's policy on fuel cost. The Government will determine the final price of natural gas for use in the generation of electricity.

kilowatt of energy produced, and is commonly expressed in BTU per kWh (or KJ per kWh). Improving the efficiency of the conversion process allows for a reduction in the volume of fuel consumed and consequently, the expenditure on fuel. The RIC had allowed 90% pass-through of fuel costs for PRE1 and had identified several areas for improvement in the heat rate in order for T&TEC to save on fuel costs.

Since PRE1, there have been changes in the generation matrix and T&TEC had put measures in place for the improvement in the overall system heat rate. T&TEC has also made reasonable efforts to contractually obligate the generators to be as efficient as possible. Consequently, the corresponding amount of fuel consumed by the generation plants, to meet the overall electricity demand, was lower than previous requirements. The changes and measures instituted by T&TEC included:

- negotiating with PowerGen to reduce the overall heat rate of its plants from 14,700 kJ/kWh down to 14,000 kJ/kWh or to face a penalty;
- reducing the amount of electricity taken from PowerGen to meet the overall demand and making up the demand from generators with more efficient machines;
- the full commissioning of the TGU combined cycle operations in 2012, which yielded an optimal heat rate for the plant in the range of 10,000 kJ/kWh, and
- utilising the Cove Plant in Tobago with a maximum capacity of 64 MW and a plant heat rate of approximately 9,000 kJ/kWh.

Hence, the RIC in the Draft Determination had proposed to allow a fuel cost pass-through of 95% which is greater than the amount allowed in PRE1, as shown in Table 7.8.

Table 7.8: Allowed Fuel Costs, 2023–2027($Million)

Year	T&TEC Projected	RIC Allowed Fuel Cost (95%)
2023	1,844.46	1,752.22
2024	1,957.62	1,859.74
2025	2,129.87	2,023.37
2026	2,252.12	2,139.51
2027	2,380.12	2,261.13
Total	10,564.19	10,035.97

Calculated by the RIC

Stakeholder Comments and Final Decision

In response to the Draft Determination, T&TEC suggested that the existing Quality of Service Scheme for the Generators should include a guaranteed standard for the heat rate in the same way the current Guaranteed Standards Quality of Service Scheme is operated for T&TEC.

The RIC acknowledges T&TEC's suggestion and advises that in the formulation of the current Quality of Service Scheme for Generators, it had explained why a Guaranteed Standards Scheme was not suitable. A Guaranteed Standards Scheme is one in which standards of performance are set for specific outputs of the utility. The utility is required to meet these minimum standards in its service delivery to individual customers or a group of customers. Failure to comply with these standards is recorded as a breach, and the utility may be required to make a pre-defined compensatory payment to customers. The compensatory payment is meant to incentivise the service provider to improve performance rather than to compensate the customer for any loss or inconvenience suffered. The scheme is best suited where there is a monopoly service provider serving many customers who, individually, have little market power. Under this scheme, the payout by the service provider can be very significant in cases where a large group of customers is affected, and the service provider is incentivised to avoid breaches. The generators have one customer, T&TEC, which, it can be argued, wields significant market power through its position as a single buyer. Therefore, a Guaranteed

Standards Scheme would not be appropriate for these generators. Further, the existing PPAs contain incentives/penalties related to the heat rate. When the RIC established the existing Quality of Service Scheme for generators (which does not rely on penalties), the RIC had chosen to limit the number of indicators, and confine the scheme to quality of service indicators and thermal efficiency (heat rate). Under this scheme a service provider is incentivised to improve performance through reputational incentives, as performance is publicised. The RIC, in keeping with its normal practice, will review the scheme periodically to ensure that it is meeting objectives and T&TEC will be invited to participate at that time.

T&TEC had also argued that the pass-through of fuel costs should be treated similarly to the 100% allowed for energy costs.

The RIC has sought to balance the interests of consumers with those of the utility by allowing less than 100% of the fuel costs to pass through. The dynamic nature of supplying electricity to consumers presents the opportunity for T&TEC, as the *de facto* system operator, to determine measures to improve the overall system heat rate.

The RIC decision is to allow a fuel cost pass-through of 95%. The allowed costs are presented in Table 7.8.

It is expected that since the RIC has made provision within the revenue requirement for payments to NGC, that T&TEC would keep its NGC's commitments current, and the RIC will monitor the situation over PRE2.

Final Decision

The RIC received no dissenting views on this issue.

Therefore, the RIC's final decision is that T&TEC must provide the RIC with a quarterly report on the status of its debt to NGC as part of its quarterly submission of its Regulatory Accounts (RAGs). The report must include details related to the timeliness and status of its payment to NGC. The RIC will assess the Report to determine what if any regulatory action is necessary.

7.5.2.10 Conclusions on Total Opex

The RIC's judgment is that the forecasts of Opex provided by T&TEC did not reflect the efficient cost of service in some areas. The RIC has, therefore, prepared its own forecast of efficient costs sufficient for T&TEC to provide services at higher than current levels. The RIC has allowed increased expenditure in the operational areas, where necessary, and increased expenditure levels for repairs and maintenance. However, the RIC has also made a number of significant reductions in the Opex amounting to $2,222 million overall for the period 2023–2027 (or $444 million annually), notably in relation to:

- generation (conversion) costs, which have been lowered by $181 million for the period 2023–2027 (or $36 million annually);
- fuel costs, which have been lowered by $528 million for the period 2023–2027 (or $106 million annually);
- total projected payroll costs, which have been lowered by $1,055 million for the period 2023–2027 (or $211 million annually);
- marketing/sponsorship expenditure amounting to $6.73 million for the period 2023–2027 has been disallowed; and
- the RIC has also included a 2% (non-compounding) efficiency factor, based on the operating efficiency improvements expected for the period 2023–2027, thereby reducing the T&D costs by $105.1 million.

The approved operating expenditure is set out in Table 7.9. These forecasts are used in the calculation of the total revenue requirement in Chapter 11. The RIC believes that it has allowed for a reasonable overall level of operating costs likely to be incurred in improving the level of service provided to customers.

Table 7.9: Total Operating Expenditure (Requested versus Approved), 2023–2027 ($Million)

	T&TEC Requested	RIC Approved	2023	2024	2025	2026	2027
Conversion Costs	9,612.93	9,431.67	1,764.99	1,788.45	1,936.61	1,957.72	1,983.90
Fuel Costs	10,564.19	10,035.97	1,752.22	1,859.74	2,023.37	2,139.51	2,261.13
Total T&D	6,663.11	5,150.13	1,013.73	1,051.54	1,046.33	1,030.73	1,007.80
Total Opex Charged to Revenue	26,840.23	24,617.77	4,530.94	4,699.73	5,006.31	5,127.96	5,252.83

Calculated by the RIC

7.6 REPORTING FRAMEWORK FOR OPEX

During its review of Opex, the RIC experienced some challenges attributable to the lack of clear separation of some cost items by activity and the need for Opex costs to be split into individual costs/activity. To address these issues, and as part of its efforts to ensure that T&TEC improves the quality and reliability of its RAGs, the RIC will be collaborating with T&TEC to establish a more comprehensive reporting framework for Opex costs. Furthermore, as an input to determining efficient costs and setting of price controls in the future, it would be useful to benchmark T&TEC's Opex expenditure against some additional areas of expenditure incurred by similar utilities. For example, three measures of unit Opex costs that may be appropriate are: Opex per network length (kilometre); Opex per GWh; and Opex per customer. Inadequate information is available at this time to derive reasonable estimates of these efficiency indicators, and the RIC will work with T&TEC to improve this area. The RAGs that have been agreed to with T&TEC are included in the Annex 3, and these will be updated as required.

8 CAPITAL EXPENDITURE

8.1 INTRODUCTION

The allowance for capital expenditure (Capex) within the revenue requirement is provided *ex-ante*[32] and the quantum is based on a detailed review of the service provider's historical performance and a rigorous examination of forecast Capex. When setting the Capex allowance, the RIC must have regard to its duties and obligations as defined in the RIC Act. In particular, the RIC must strike a balance between incentivising efficient behaviors and ensuring that service providers are able to finance their Capex programme and earn sufficient return. In addition to the allowed Capex, adjustment mechanisms are also included in response to changes in the proposed Capex. At each price control period, the RIC can also undertake an *ex-post* efficiency assessment[33] of Capex and can retrospectively allow or disallow Capex that was efficiently or inefficiently incurred.

Capital related costs can account for a very significant portion of total costs of a service provider. As a result, such costs can have a notable impact on the final prices paid by customers. Capex enters the revenue requirement of the service provider indirectly through the return on capital and through the return of capital (or depreciation). More specifically, past Capex, deemed to be efficiently incurred, is included in the starting RAB and the forecast Capex is added to the starting RAB to derive the forecast of the annual RAB. The inclusion of only efficient and prudent Capex in the RAB, ensures that customers do not pay for Capex that is incurred from poor investment decisions. Therefore, the regulator's decision vis-à-vis the appropriate level of Capex to be allowed into the RAB, is a critical one. To determine the amount of past and forecast Capex that should be included when rolling forward the value of the RAB, the RIC assessed whether:

- past Capex was prudent, and
- forecast Capex for PRE2 is also prudent and efficient.

[32] Allowances for Capex set in advance of when the expenditure on capital projects actually occurs.
[33] Assessment of events after they have occurred, inclusive of the results/outcomes.

8.2 CAPEX REVIEW PROCESS

In establishing Capex requirements for T&TEC, the key issues for the RIC are to ensure that:

- Capex reflects the level of capital expenditure that would be undertaken by an efficient service provider;
- there is no evidence of unnecessary or inappropriate Capex;
- there was evidence of, and consistency with, a well-developed asset management plan, and processes that demonstrated that forecasts took account of the planning horizon which extends beyond the five-year control period;
- the service provider quantifies the reduction in Capex through improved efficiency;
- Capex requirements are consistent with the service provider's demand forecasts, service targets and other obligations;
- the service provider's Capex forecasts are credible in light of the outturn results; and
- the proposed programme of Capex is deliverable within the five-year control period.

As in the case of Opex (Section 7.2), the expenditure review process for Capex consists of the same three stages; set-up stage, facilitation stage and assessment stage. T&TEC was, therefore, required to provide details of Capex forecasts, together with supporting explanations and information for:

- demand-driven (or reinforcement) Capex to meet growth in demand;
- non-demand related or replacement Capex to replace assets at the end of their economic lives;
- improvement expenditure to improve reliability and quality of service through an ability to outperform quality of service standards already set; and
- expenditure for other purposes, including non-network general assets and network control.

After preliminary analysis of the information, the RIC identified a number of anomalies and aberrations that required clarification. Subsequently, the RIC discussed the submission with T&TEC to improve its understanding. The process to eliminate the anomalies was protracted, as supporting information, such as demand forecasts, remaining asset lives, network reliability, quality targets and long-term asset management plans, had to be sourced from T&TEC to ensure that the expenditure forecasts were internally consistent and reconcilable with the information submitted.

8.3 APPROACH TO ASSESSING CAPEX

The overall aim of assessing the service provider's Capex is to ensure that proposed investments are necessary, efficient and should be funded within the price limits. The assessment is generally undertaken utilising a number of tools and methods.

The common forms of incentive-based regulation set *ex-ante* allowances for Capex when calculating the price limits. The standard approach is to review the service provider's Capex forecast submitted in its business plan, primarily through bottom-up analysis. An adjustment for achievable efficiencies is applied, generally using benchmarking.

In order to assess T&TEC's proposed Capex, the RIC adopted a relatively intensive review of the proposed projects. The steps undertaken included:

- Evaluating the reasonableness of the proposed Capex by performing:
    (i) **Efficiency Tests** – to determine if the proposed Capex was representative of the best way to meet customers' needs for services.
    (ii) **Prudency Tests** – to establish whether the decision to invest is prudent, given the particular and specific circumstances at the time.
    (iii) **Used and useful Tests** – to examine whether the particular assets/equipment /plant are utilised in, and contribute to, the provision of the particular service.

- Engaging with T&TEC throughout the exercise to obtain the necessary information to undertake a thorough assessment. This facilitated the bottom-up assessment of the capital programme and provided the rationale for the decisions taken, concerning the selection and execution of projects under the programme.

- Categorising the Capex according to four major categories: Transmission, Distribution, Other Network Related and Non-Network Related projects, thereby allowing an in-depth analysis of the level and the timing of the proposed investments.
- Undertaking an *ex-post* review of T&TEC's Capex for PRE1.

A detailed discussion of the RIC's overall approach can be found in the document, **"Approach to Assessing Capital Expenditure for Price Reviews"**, **(May 2021).**

8.4 REVIEW OF CAPEX OUTTURN

8.4.1 First Regulatory Control Period (June 01, 2006 to May 31, 2011)

The main objectives for the review of T&TEC's historical Capex were to assess whether the Capex had been efficiently incurred, and the expected benefits had been achieved. T&TEC spent approximately $1,944.04 million on capital works/projects over the period, of which, $738.60 million was spent on projects under the Government's Public Sector Investment Programme (PSIP), and for ring-fenced projects.[34]

The amount spent by T&TEC on RIC allowed Capex projects for PRE1 exceeded the quantum allowed by the RIC for the period. More specifically, while the RIC allowed a total of $800.00 million for Capex over PRE1, T&TEC reportedly spent $1,205.44 million, approximately $405 million over the allowed amount. T&TEC provided no rationale for exceeding the RIC's total Capex allocation for the allowed list of projects by 50.7%. However, the variance of actual to forecasted expenditures may be attributed to a number of reasons including:

- higher than anticipated prices of materials and components/or services used in the undertaking or delivery of projects;
- under-estimation of expected project costs; or
- poor implementation of the capital programme.

[34] Typically, a ring-fence is a virtual barrier that segregates a portion of an individual's or company's financial assets from the rest. For PRE1, some projects were ring-fenced to ensure that no tariff monies were expended on those projects and the projects were explicitly identified.

T&TEC was not able to complete several projects that were viewed by the RIC as critical to service delivery. T&TEC undertook just over 64% (or 69 of 107) of the projects that the RIC had allowed for the entire period. Thus, 38 allowed capital projects were not undertaken. Further details of the Capex for PRE1 were presented in the Draft Determination.

8.4.2 Lag Period (2011–2020)

The main objectives in reviewing T&TEC's Capex, for the lag period (2011–2020), were to assess whether the out-turn Capex was prudent, and to determine whether customers benefited from the capital works which were financed by tariff revenues.

T&TEC's total capital expenditure over the period January 2011–December 2020 amounted to approximately $3,454.15 million. Approximately $2,383.08 million (69% of total Capex) was funded by tariff revenue, and $1,071.07 million (31% of total Capex) financed by the Government either through the Public Sector Investment Programme (PSIP) or other Government derived funding. By way of comparison, the total capital expenditure for PRE1 amounted to approximately $1,944.04 million, with funding of approximately $1,205.44 million derived from tariff revenue (62% of total Capex).

As seen in Table 8.1 the annual total out-turn Capex funded from tariff revenue, varied between $41.53 million in 2020 (January to May) (minimum) and $399.23 million in 2018 (maximum). The out-turn Capex under the different investment categories funded by tariff revenue also varied significantly on an annual basis. There is no indication that T&TEC had attempted to smooth the spending levels over the period. As the distribution network constitutes a major portion of T&TEC's installed infrastructure there was significant capital expenditure on these assets which amounted to approximately 58% of the total Capex funded from tariff revenue every year during the period 2011 to 2020.

Table 8.1: Tariff Revenue Funded Capex Out-turn by Investment Category 2011–2020 (TT$ Millions)

Category / Year	Transmission	Distribution	Other-Network Related	Non-Network Related	Total
2011	39.05	154.44	2.89	9.95	**206.33**
2012	53.12	124.80	4.17	8.38	**190.47**
2013	77.95	127.32	8.98	39.78	**254.03**
2014	129.15	149.47	18.06	15.47	**312.15**
2015	31.02	136.62	4.66	10.57	**182.87**
2016	81.06	168.88	10.7	20.83	**281.47**
2017	61.31	139.28	9.21	22.26	**232.06**
2018	66.81	187.85	17.65	126.92	**399.23**
2019	52.67	107.19	10.92	8.79	**179.57**
2020*	6.04	22.35	5.29	**7.85**	**41.53**
Total	**598.18**	**1,318.20**	**92.53**	**270.8**	**2,279.71****

Compiled by the RIC

*** T&TEC's Business Plan provided a Capex breakdown for January–May, 2020.**
**** The total for 2011–2020 presented in Section 8.4.2 differs from the total presented in Table 8.1 because the total for the tariff-funded capital expenditure reported in Section 8.4.2 covered the period January to December, 2020, while the breakdown of the tariff-funded capital expenditure covered the period January to May, 2020.**

The expenditure for the period (2011–2020), while not covered via a price review, has benefitted customers through enhanced service and reliability. Therefore, the Capex has been included into the RAB because the investments are considered to be prudent and useful.

8.5 ISSUES AND PROPOSALS ARISING FROM CAPEX ASSESSMENT

8.5.1 Use of Tariff Revenues for Government Driven (Non-Allowed) Projects

Approximately $704.9 million of tariff revenue was expended on projects in PRE1 which should have been financed by Government. This may have affected T&TEC's ability to undertake and complete the projects that were allowed by the RIC. In the Draft Determination, in an effort to ensure that tariff revenue would not be used for purposes other than those specified in PRE2, the RIC proposed that the Board of T&TEC should provide self-certification assurances, in writing, for projects listed under the heading "Use of Tariff Revenues". This was intended to provide a documented commitment (certification assurances) by T&TEC's Board to fulfil regulatory mandates, and to desist from using tariff revenues for activities not approved by the RIC.

Stakeholder Comments and Final Decision

T&TEC indicated that its management was very committed to meeting the RIC's directives, including the use of tariff revenues for the projects specified for PRE2, but had no intention of asking its Board to sign off on self-assurance certificates.

The RIC notes that self-assurance is important in building trust and confidence, and is a key element in the regulatory framework for monitoring of utilities, and is used by regulators such as Ofwat.[35] Ofwat maintains that companies are expected to have processes in place to ensure that the information they provide can be trusted. Under Ofwat's self-assurance requirements, the Boards of these water companies must provide:

- explicit sign-off of the assurance that they are providing to give stakeholders the confidence that the information they publish is accurate and reliable.
- full transparency on the audit procedures.
- a summary of the outcome of the assurance that their company has carried out.

The RIC understands that such a measure may seem novel but maintains that assurance is an important cornerstone of the new regulatory framework.

The RIC's decision is that the General Manager (Chief Executive Officer) of T&TEC must provide assurance, through certification, that T&TEC will fulfil regulatory mandates and desist from using tariff revenues for Capex activities not approved by the RIC, unless there is an over-riding reason to reprioritise the Capex projects.

[35] The regulator of the water sector in England and Wales.

8.5.2 Under or Over-spend on (RIC Allowed) Capex Projects, and Incomplete (RIC Allowed) Projects

T&TEC's total spending on the RIC's allowed projects in PRE1 was higher than the allowed amounts, yet there were many projects that were either incomplete (and/or over budget) or not commenced. To address this issue, there is a need for a mechanism(s) to account for; (1) the under and over-spend on projects, (2) projects not undertaken and (3) projects not completed.

With respect to **over-spends** on allowed Capex, as a result of cost overruns, the possibilities for adjustment of the RAB are as follows:

- **(a)** Where over-spends are determined to be inefficient, the associated excess spend may not be allowed in the RAB, thus consumers will not have to fund that expenditure into the next period.
- **(b)** Where over-spends are determined to be efficient the associated excess spend will be allowed in the RAB.

With respect to **under-spends** on Capex, which arise when expenditure is less than the allowed amounts, either due to efficiencies or if a project is not undertaken, the corresponding options for adjustment of the RAB are as follows:

- **(a)** Where allowed projects **are not undertaken**, excess returns can be clawed back[36] at the end of the regulatory period.
- **(b)** Where allowed projects **are undertaken** and the associated expenditure is less than the allowed amount, two options may be used, as follows:
    1. The RAB can be adjusted downward at the end of the period. The service provider would have benefitted from the savings during the past period and customers would now benefit from a lower than anticipated increase at the beginning of the new control period, when the RAB is adjusted; or
    2. The approved expenditure is retained in the closing RAB with no adjustment for actual spending. This option provides strong efficiency incentives, as utilities benefit from earning a return on forecast rather than the actual RAB and are not

[36] Claw back results in downward adjustment of the revenue requirement for the subsequent regulatory period.

disadvantaged if they reduce their actual spending on the approved capital programme. However, in such a case there is also a strong incentive for inflated Capex projections to be presented.

For PRE1, T&TEC's inability to execute the allowed capital programme resulted in 38 projects not being undertaken. The RIC's allocation for those projects was $170.1 million, hence excess returns (on capital) of about $13.6 million accrued to T&TEC. The RIC is cognisant that considerable time has elapsed between PRE1 and the conduct of PRE2; however, if this occurs in the future, the RIC will consider the following three actions:

(a) Adjusting the revenue requirement for the subsequent regulatory period, as is the common practice of regulators, in similar circumstances. However, such an approach may have the unintended consequence of signaling to customers that the cost of delivering the service has decreased, which would not be accurate.
(b) Providing rebates to customers to account for the excess returns realised. This option would send strong signals to T&TEC about the importance the RIC places on the completion of priority projects, and the consequences of not undertaking them.
(c) Identifying specific projects that any excess returns would be spent on, in order to improve the quality of service to customers. However, this would introduce issues relating to appropriate project selection, as any project selected would have to be such that there is no perceived bias in terms of the beneficiaries thereof.

With respect to the **substitution of projects** under the allowed Capex with other projects, on the basis that the new projects achieved better outcomes than the originally allowed ones. The RIC's view on the treatment of investment funds provided *ex-ante*, for projects which have been cancelled or delayed, is that the service provider should retain the revenue associated with such projects, provided that the decision was based on sound reasoning, and that the overall outcome of such a decision, is beneficial to customers.

Final Decision

The RIC will consider the options outlined in Section 8.5.2 for dealing with under-spend, over-spend and the substitution of projects in the future (PRE3 and beyond).

8.5.3 The Capex Incentive Mechanism

Government or State-owned and -run utilities often do not respond to financial incentives like private firms, which generally seek to maximise their profit. This may be largely due to the way in which the Government perceives and executes its ownership function, and the type of financial support/arrangements provided. If a Government-owned utility is operated as a commercial enterprise, where its viability depended on its ability to recover costs and improve efficiency, it would respond more favourably to efficiency incentive mechanisms. Even though T&TEC is State-owned, the RIC favours the use of some tools to incentivise the utility, whether via efficiency carryover or other types of incentives mechanisms. Such mechanisms can include:

- **Capex Triggers** – when rates and charges have been set for a control period, a guaranteed level of revenue is allowed based on projected levels of Capex and as such, there may be an incentive for the service provider to delay the investment. Hence, the RAB-based approach unintentionally incentivises firms to overstate their investment plans at the time of a review in order to influence the size of the RAB and defer investments during the control period to benefit from the "saving". A Capex trigger can address this issue by making allowances in rates and charges conditional on the achievement of project milestones. Triggers can be positive or negative, thereby either increasing or decreasing revenues if an event occurs. The use of triggers would be most suitable for large, clearly identifiable projects. Capex triggers can be complex to design and, determining the proportion of revenue that should be at risk for failure to meet the target or project milestone is a challenging process.
- **Provisions for the inclusion of Contingent Projects in the revenue determination** – contingent projects are those that may be necessary, but which are excluded from the *ex-ante* allowance in the revenue requirement, based on uncertainty of the projects themselves or of their costs. The provision is exercised only if such contingent projects are actually undertaken, in which case, the service provider will be allowed the revenue, with the regulator's approval. The cost of such contingent projects must exceed a minimum amount (expressed as a percentage of the allowed revenue) before it is considered for inclusion in the allowed revenue. This mechanism is viewed as less suitable to distribution expenditure than it is to transmission expenditure, given that

distribution expenditure tends to be smaller and can be less discrete than transmission capital expenditure. Further, it can also be administratively burdensome.

- **Logging Up** – this allows for the inclusion of Capex not previously funded in the current price control to be included and accounted for in the subsequent price control period.
- **Capex Information Quality Incentive** – under this incentive, the service provider will be rewarded for its accuracy in forecasting, that is, if the service provider's forecast is within 10% of the RIC's assessment, the service provider will be provided additional income at the beginning of the next control period, equivalent to the allowed cost of capital multiplied by the difference in the RIC's allowed Capex and T&TEC's proposed Capex.

Final Decision

The RIC received no dissenting views on this issue.

The RIC's decision is to utilise "logging up", as required, and employ a Capex Information Quality Incentive as described above for PRE3.

8.5.4 The Capex Reporting Framework

Monitoring, and reporting on projects, are critical to ensure the successful execution of T&TEC's capital programme and in the Draft Determination, the measures that the RIC proposed to apply were as follows:

- Implementation of a system of regular engagement with T&TEC to monitor Capex projects and ensure that Capex spend is in line with the RIC's allowances.
- Establishment of a semi-annual reporting framework in which T&TEC will be required to submit Capex reports, which are suitable for public release. The RIC is hopeful that the conditionality of public reporting will motivate T&TEC to conscientiously undertake and complete the allowed capital programme. Specifically, these reports will include information on the status of projects, particularly timing and cost variances. The format of these reports will be determined by the RIC inclusive of the level of granularity.

- Provision by T&TEC of detailed data on **each project** annually (to be called **Annual Investment Return**[37]). The information to be submitted in the Return will include:
    - forecast and actual project spend for the year;
    - explanations of financial variances;
    - total forecast spend on the project; and
    - physical progress of the project against defined milestones.
- Establishment of fixed dates by which T&TEC must meet and achieve Capex-related Directives. Where deadlines are not met T&TEC will be held accountable.
- Conduct of a mid-term review of Capex at the RIC's discretion.
- Implementation of a Capex Safety Net – this allows for the review of the Capex allowance where the Capex underspend/overspend in any given year of the control period, is greater than 20% of the allowed Capex.
- Employment of Public Disclosure of Non-Compliance and/or Public Register notices on the RIC's website. Through these notices, the RIC will publish the occurrences and the way T&TEC has not complied with any targets set for its achievement, inclusive of allowed capital investment projects.

Stakeholder Comments and Final Decision

T&TEC queried the use of Public Disclosure of Non-Compliance and/or Public Register Notices, stating that it should be provided with an opportunity to provide reasons for non-compliance and the non-compliance should not be published where valid reasons are provided. It was also not in favour of quarterly returns to facilitate ongoing monitoring of its Capex through the Annual Investment Return and requested clarification on the data requirements for that Return.

The RIC, consistent with the approach taken with its other regulatory policies, will discuss all of these matters prior to implementation. The RIC notes that it has always carefully reviewed T&TEC's explanations in instances where it is considering possible non-compliance with respect to any of its existing policies and it will continue to do so in the future. Additionally, with respect to the data requirements, it has always been the intent to institute a formalised

[37] T&TEC will also be expected to submit quarterly returns to facilitate ongoing monitoring.

reporting framework, as exists for other policies, inclusive of the provision of relevant templates. With respect to quarterly reporting, the RIC expects that T&TEC, as part of a robust internal framework for monitoring its projects, would either have or be eager to establish appropriate systems to do so in the shortest possible timeframe.

The RIC's decision is that Capex Reporting Framework will be as described in Section 8.5.4.

8.5.5 Other Issues

In order to improve the quality of Capex submissions and to treat with the other issues that had arisen in PRE1, or may arise in future price reviews, relating to T&TEC's execution of the allowed capital programme, the RIC, in the Draft Determination, stated that it may require:

- The use of a self-assurance process, the details of which must be submitted by T&TEC to the RIC at the time of a submission of a Business Plan, in which there is an assurance by T&TEC's Board that the Capex projections accurately reflect the underlying information base. This is an internal process which does not necessarily entail external scrutiny or assurance.
- The employment of a "Reporter" (independent consultant/engineer) to interrogate T&TEC's proposed Capex for PRE3. The RIC will take the Reporter's proposals into account. The service provider will pay the Reporter's costs, but the Reporter is approved by the RIC and will report to the RIC.
- The development and submission of detailed Asset Management Plans alongside longer-term capital investment plans, with a view to assess how T&TEC's proposed Capex relates to, and corresponds with same. The RIC may also require the service provider to include in its business plan a review of "unit cost" trends, where possible.
- The continuation of detailed *ex-post* efficiency reviews of T&TEC's performance with respect to capital expenditures.

Stakeholder Comments and Final Decision

T&TEC in its comments, noted that it had no intention of asking its Board to provide this assurance and will endeavor to ensure that its Capex projections are accurate. T&TEC also expresses strong disagreement with the use of a "Reporter" (independent consultant/engineer) to interrogate T&TEC's submission of its proposed Capex for future price reviews.

The RIC has considered T&TEC's views and had already discussed the importance of assurance under the comments provided in Section 8.5.1. The RIC notes that where similar regulatory frameworks have employed this initiative, the response by companies is markedly different from T&TEC. For example, Northumbrian Water Limited stated its full support for this measure.[38] The RIC notes that the use of Reporters is a common and long-standing feature of regulatory frameworks in jurisdictions such as the UK, similar to the framework that exists here. Indeed, the appointment of a Reporter is a licence condition for Ofwat.

The RIC's decision is that it will utilise the requirements listed under Section 8.5.5 as it sees fit for future reviews, except that assurance certification is to come from the General Manager (Chief Executive Officer), of T&TEC after it is approved by its Board.

8.6 REVIEW OF FORECAST CAPEX

8.6.1 Overview

The objective of the review of the Capex programme for PRE2 was to ensure that the Capex is necessary and represents value for money for the customers. To achieve this objective, the RIC reviewed:

- T&TEC's strategies to ensure that the planned Capex is needed, can be delivered in the timeframe and represents best value for the customers;
- the benefits that the Capex programme will bring to the network and whether these benefits are valued by the customers;

[38] See "Company monitoring framework- further consultation - Northumbrian Water Limited response", undated.

- the cost drivers and nature of the projects making up the forecast Capex Programme; and
- the potential efficiencies in the delivery of the forecast Capex programme.

The RIC believes that there are opportunities for T&TEC to achieve efficiencies/savings in Capex, although at a lower level than what may be achievable for T&TEC's operational activities, as a large portion of Capex costs may be related to materials and contractors. The benefits that result from Capex efficiencies achieved in terms of avoided asset related costs, that is, reduction in depreciation and return, will be passed on to customers within PRE2.

8.6.2 T&TEC's Proposed Capex

T&TEC submitted a Capex programme valued at $2,238.7 million, for PRE2. The disaggregated Capex submitted by T&TEC is shown in Table 8.2 below. The Capex programme is aimed primarily at the rehabilitation and replacement of assets to ensure they perform at a level that meets the standards established for customers and customer expectations. The following sections present the review and assessment of the requested Capex and provide details on the RIC's decisions.

Table 8.2: T&TEC's Capex Submission for 2023–2027, $Million

Category	2023	2024	2025	2026	2027	Total
Transmission-Sub-transmission - Refurbishments and Replacements	41.6	72.1	78.0	55.8	24.7	**272.2**
Transmission and Sub-transmission – New Substations	0.0	20.8	27.5	40.0	9.7	**98.0**
Distribution	209.9	126.6	90.0	89.9	80.5	**596.9**
Street Lighting	21.2	11.8	8.8	10.3	5.8	**57.9**
Other Network Related	10.0	5.0	4.0	4.0	4.0	**27.0**
Non-Network Related	306.6	295.3	352.2	159.9	72.7	**1,186.7**
Total	**589.3**	**531.6**	**560.6**	**359.8**	**197.4**	**2,238.7**

8.6.3 Assessment and RIC's Allowed Capex

Tables 8.3 and 8.4 summarise T&TEC's submission and the RIC's decision for Capex in PRE2. The RIC's allowed Capex for PRE2 is $1,677.3 million, which is $561.4 million, or 25% less than that requested by T&TEC. Some of the main considerations in determining the allowed Capex were the:

- reduction of Capex for projects that were deemed not to be prudent;
- exclusion or ring-fencing of projects to be funded by Government;
- revaluation of expenditure on projects that were too loosely defined, and lacking supporting information and project detail;
- adjustment for expenditure on projects with similar scopes of works/materials but with inconsistencies in costing; and
- exclusion of expenditure for projects whose duration extended beyond the second control period, and inclusion of only the costs associated with the parts of the project works which will be completed within the control period.

Table 8.3: T&TEC's Requested and RIC's Allowed Capex, 2023–2027 (TT$Million)

	Projects													
YEAR	Transmission - Refurbishment and Replacements		Transmission & Subtransmission new Substations		Distribution		Street-Lighting		Other Network-Related		Non-Network Related		Grand Total	
	Req. $	All. $	Req. $	All. $	Req. $	All. $	Req. $	All. $	Req. $	All. $	Req. $	All. $	Req. $	All. $
2023	41.55	**36.08**	0.00	**0.00**	209.93	**178.48**	21.22	**6.25**	10.00	**9.70**	306.56	**86.35**	589.26	**316.86**
2024	72.15	**50.53**	20.80	**10.00**	126.55	**109.11**	11.80	**21.46**	5.00	**4.85**	295.28	**193.19**	531.58	**389.14**
2025	78.05	**56.33**	27.50	**5.00**	90.05	**81.64**	8.80	**11.16**	4.00	**3.88**	352.24	**168.81**	560.64	**326.82**
2026	55.77	**44.58**	40.00	**11.20**	89.86	**81.05**	10.30	**10.00**	4.00	**3.88**	159.89	**158.13**	359.82	**308.83**
2027	24.70	**24.50**	9.70	**6.20**	80.51	**76.17**	5.80	**5.64**	4.00	**3.88**	72.72	**219.27**	197.43	**335.66**
Total	**272.22**	**212.02**	**98.00**	**32.40**	596.89	**526.45**	57.90	**54.50**	27.00	**26.19**	1,186.69	**825.75**	2,238.72	**1,677.30**

Calculated by the RIC

The Capex allowance set by the RIC reflects assumptions about load growth and new connection numbers. As seen during PRE1, outturn Capex can be different from the allowed Capex as, ultimately, it is the service provider's responsibility to plan and develop the network system efficiently. While the RIC's Capex allowance is based on T&TEC's submission for PRE2, given the possibility of changing circumstances, the onus is on the service provider to determine which projects are progressed, which new projects (not included in its submission) are necessary and efficient, and which projects are deferred subject to the overall cap on Capex. The RIC will review the outturn at the end of PRE2 and only efficient and necessary Capex will be added to the RAB.

Table 8.4: Assessment of T&TEC's Capex Forecast, 2023–2027

Project Area	Total Amounts ($Million)		Remarks
	Forecast	Allowed	
Transmission – Sub-transmission Refurbishments and Replacements	$272.2	$212.0	Adjustments were made to the Capex forecast to correct for inconsistencies in the costing of projects with similar scopes and based on the RIC's determination of an average unit cost for major plant/equipment, and application of such costs to projects with a degree of similarity.
Transmission & Sub transmission – Development Projects	$98.0	$32.4	Adjustments were made to the Capex forecast to correct for inconsistencies in the costing of projects with similar scopes and based on the RIC's determination of an average unit cost for major plant/equipment, and application of such costs to projects with a degree of similarity.
Distribution	$596.9	$526.4	Adjustments were made to the Capex forecast as follows: • Projects with similar scopes were adjusted according to an average unit cost for major plant/equipment. • Forecasted growth and other criteria unique to the Distribution Area were used to adjust "blanket projects" with inadequate information.
Street Lighting	$57.9	$54.6	Adjustment for projected efficiency gains in project execution was made to the Capex forecast.
Other Network Related	$27.0	$26.2	Adjustment for projected efficiency gains in project execution was made to the Capex forecast.
Non-Network Related	$1,186.7	$825.7	Adjustments were made to the Capex forecast as follows: • Projected efficiency gains in the execution of most of the projects in this category. • Fifty percent of the Capex required to finance the portion of the AMI replacement project, to be carried out during PRE2, has been allowed from 2024. The existing AMI was implemented in 2007–2009, notwithstanding concerns expressed by the RIC. Some features, such as the Outage Management System (OMS) have not yet been fully implemented. This has delayed the automatic payment for breaches of the Guaranteed Electricity Standard, GES1. The RIC is of the view that the planned replacement of approximately 50% of all meters during PRE2 will allow for proper planning of the project's rollout and the sourcing of a robust system with full OMS capability and which supports advanced rate options.
Total	**$2,238.7**	**$1,677.3**	

Calculated by the RIC

The RIC's annual Capex allowances for the control period are rolled forward into T&TEC's regulatory asset base (less depreciation and disposal). The annual RAB values for PRE2 are listed in Table 8.5.

Table 8.5: RIC's Allowed Regulatory Asset Base for 2023–2027 ($'000)

	2023	2024	2025	2026	2027
Opening RAB	5,415,045	5,700,732	6,026,476	6,198,458	6,350,224
Inflation Adjustment	249,092	216,628	126,716	123,969	120,654
Capex	316,870	389,140	326,820	308,830	335,660
Less Depreciation	(279,275)	(279,024)	(280,554)	(280,033)	(280,835)
Less Disposals	(1,000)	(1,000)	(1,000)	(1,000)	(1,000)
Closing RAB	5,700,732	6,026,476	6,198,458	6,350,224	6,524,703

Calculated by the RIC

Stakeholder Comments and Final Decision

T&TEC requested that the RIC identify specifically the Capex that has been disallowed or reduced and the reason for so doing.

The RIC disallowed four (4) projects, amounting to $11.3 million and the reasons were varied. The RIC will, as part of its formalised reporting framework, provide templates detailing the allowed projects.

The RIC's allowed Capex is as detailed in Tables 8.3 and 8.4 and the allowed RAB is as shown in Table 8.5.

9 INCENTIVES AND PERFORMANCE MONITORING

9.1 INTRODUCTION

An important consideration for the regulator is to set challenging and achievable levels of performance for the service provider to promote customers' interests. Consequently, the regulator must monitor progress against the minimum acceptable performance level that it sets, and verify that service levels do not decline as a result of any action by the service provider to reduce costs. During the regulatory control period, it is important to monitor T&TEC's progress in reducing costs and improving service levels. Performance reporting enables stakeholders to assess compliance with regulatory determinations and compare the performance of service providers. Consequently, it is important for proper service delivery that the RIC effectively monitors T&TEC's performance in accordance with the regulatory framework.

Incentive regulation includes mechanisms within the regulatory framework to maintain or improve service quality. These incentive mechanisms include:

- specifying service standards and obligations to be met during a regulatory period;
- reporting performance against service standards/obligations as part of the performance monitoring and reporting regime;
- designing financial incentive mechanisms to reward and penalise the service provider for performance that varies from pre-determined benchmarks/standards; and
- any combination of the above.

In PRE1, the RIC utilised a combination of mechanisms; non-financial incentives (e.g. performance monitoring and reporting), and financial incentives (such as an efficiency carryover mechanism and the guaranteed standards of service scheme). The RIC intends to continue with many of the existing incentives and to propose a number of additional mechanisms and tools to encourage specific desirable behaviour by the service provider.

This chapter will discuss T&TEC's past performance in relation to the non-financial and financial incentives utilised by the RIC in PRE1. It will identify the existing incentives that the RIC will continue with and the additional mechanisms and tools that will be utilised to encourage specific desirable behaviour on the part of the service provider during PRE2. It will also describe how the RIC will continue to monitor, analyse and report on T&TEC's performance in PRE2.

9.2 ROLE OF INCENTIVES IN GOVERNMENT-OWNED UTILITIES

Some of the more intractable problems associated with incentive-based regulation occur where the utility is State-owned. These problems can be exacerbated when the government, as owner, is not focused on performance, as would occur under private ownership. Compared with private sector companies where directors are accountable to shareholders, the Board/management of the government-owned entities may pursue their own objectives more freely in the absence of these checks and balances. Although some accountability mechanisms exist in the public sector, once the Board/management has the freedom to pursue its own objectives, incentive-based regulation becomes less effective for several reasons, including:

- board/management is less incentivised because the penalties for failure are minimal, and the rewards for success are also smaller;
- public sector managers are often not subject to performance management systems and associated rewards and consequences as obtains in the private sector;
- there is no real bankruptcy threat as even a poor-performing entity can expect to be bailed out by the State; and
- the market for corporate control is also absent.

The poor performance of entities with government ownership is also due to a number of other factors, including:

- complex and sometimes conflicting social, political and economic objectives;
- short-term focus because of changing political objectives;
- pressure from ministerial intervention at the expense of accountability; and
- selective representation of customer needs.

Some measures have been implemented to align management incentives in Government-owned entities with the regulatory regime. Strengthening the governance regime to better align the incentives of the Board and management to clear service quality and financial performance objectives is critical to improving performance and encouraging positive action in a State-owned entity. The impact of the incentives can be both financial and reputational, that is, where poor service quality performance is prominently reported in the media. Therefore, for government-owned entities, where the profit-motive is absent, management is likely to be more focused on achieving outputs as this will directly impact the reputation of the entity and its senior management.

The RIC believes that the performance targets being established for PRE2, both existing and new, are challenging but achievable, and will encourage T&TEC to maintain or improve its performance.

Stakeholders who require further information should refer to the RIC's documents, **"Regulating Quality of Service", "Performance Monitoring and Reporting", and "Incentive Mechanism for Managing System Losses".**

9.3 SERVICE RELIABILITY INDICATORS

The RIC did not establish any financial incentive mechanism to improve supply reliability in PRE1. However, T&TEC was required to collect information on three reliability measures (generally referred to as a **"paper-trial" S-factor**). The three reliability measures are the: System Average Interruption Frequency Index (SAIFI), which measures the average number of interruptions per customer, System Average Interruption Duration Index (SAIDI), which measures the average number of minutes of interruption per customer and the Customer Average Interruption Duration Index (CAIDI), which measures the average outage duration per customer.

Based on the data collected from T&TEC over PRE1, the calculated values for both SAIDI and SAIFI are approximately three to four times larger than the average of the US Distribution System. Tables 9.1 and 9.2 below show T&TEC's performance regarding quality of supply to its customers.

Table 9.1: Network Reliability Indicators for T&TEC, 2005–2016

Indicator	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	USDS*
SAIFI (No. per Customer)	11.43	9.93	10.1	6.94	5.55	6.61	5.68	5.71	5.21	4.42	4.4	4.7	1.082
SAIDI (minutes)	1116	996	1020	603	487	563	486	464	398	326.2	307.8	400	119.8
CAIDI (minutes)	98	100	100	93	87	85	86	81	76	73.8	70	86	110.7

Compiled by the RIC
*USDS – Reliability Metrics of U.S. Distribution System (2016).
Source: U.S. Energy Information Administration.

Table 9.2: Network Reliability Indicators for T&TEC, 2012-2021

Indicator	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	USDS**
SAIFI (No. per Customer)	5.71	5.21	4.42	4.4	4.7	4.5	3.9	4.8	5.01	3.75	1.039
SAIDI (minutes)	464	398	326.2	307.8	400	417	389	463	483.0	308.4	125.7
CAIDI (minutes)	81	76	73.8	70	86	93	99	97	96.41	82.24	120.9

Compiled by the RIC
** USDS – Reliability Metrics of U.S. Distribution System (2021).
Source: U.S. Energy Information Administration.

In its document, **"Regulating Quality of Service"**, the RIC discussed in detail the complexity of implementing an S-Factor scheme. Among other things, the RIC also noted the difficulty of measuring service standards, calibrating the level of service into a dollar measure based on customers' values and designing a scheme to reward or penalise the service provider. Further, other issues of concern were the accuracy and availability of data and the observed variability of the service performance indicators of T&TEC. Given the issues discussed, the RIC is concerned that the S-factor scheme, if introduced, at this time, might not work as intended.

Instead, the RIC will continue to monitor the performance indicators and standards of service introduced in PRE1 and to publish T&TEC's performance accordingly in the RIC's

Performance Indicator Report. The RIC will also continue its guaranteed service standards scheme, and will continue to monitor and publish annually T&TEC's performance under this scheme. Further, the RIC is of the view that there is a strong case for introducing new regulatory measures to encourage improved service performance. Hence, in the Draft Determination the RIC had decided to ensure that reliability improvements are a central operational issue for T&TEC. Therefore, the RIC provided funding in the revenue requirement to undertake works on the network during PRE2 to aid such improvements. To further reinforce the issue, the RIC had stated that both management and supervisors must be continuously briefed, inclusive of the financial implication of outages for the utility. The RIC also made suggestions with respect to measures which could be undertaken to ensure that improving reliability would be a core concern at the operational level. These included:

- making reliability a core issue for discussion at monthly management meetings in each distribution area;
- a change of practice whereby outages are planned for half a day instead of a whole day, where possible and feasible;
- greater utilisation of live-line working techniques alongside strict adherence to the highest levels of safety practices; and
- setting performance targets for each area, and increasing supervisory and operational staff awareness of the real financial cost of customer interruptions and lost service hours.

In addition, T&TEC is required to report semi-annually on its efforts in areas described above.

Stakeholder Comments and Final Decision

T&TEC indicated that half–day outages were not cost-effective in all instances.

The RIC noted T&TEC's concern, but in the Draft Determination had only requested a change in the practice where it is possible and feasible. The RIC expects that T&TEC will make its best effort to reduce the length of planned outages.

T&TEC also preferred to report on an annual basis on their efforts to improve reliability.

The RIC is of the view that semi-annual reporting strikes a reasonable balance between the reporting burden placed on T&TEC and the need for appropriate compliance monitoring to assure accountability.

The RIC's final decision is to continue to monitor the performance indicators and quality of service standards introduced in PRE1 and to publish T&TEC's performance on both. T&TEC is also required to report semi-annually on its efforts to improve reliability, inclusive of the measures outlined in Section 9.3.

9.3.1 Improving Service to Worst-Served Customers

While SAIFI and SAIDI targets incentivise the service provider to reduce the total levels of interruptions to customers, many areas in the country experience frequent outages. Outages in these areas have only a negligible impact on the overall interruption statistics. Table 9.3 below shows the areas with the most outages for 2021. The computed average number of outages experienced in these areas range from two (2) per month to over twenty-nine (29) per month. T&TEC has indicated that most of the outages occur because of animals coming into contact with overhead lines as well as contact made by vegetation. To reduce these outages, T&TEC must examine the root causes for these outages and undertake appropriate measures, including:

- installing overhead line covers;
- installing tall insulators and short pins;
- increasing the use of covered conductors;
- replacing porcelain insulators with polymeric insulators;
- installing new auto reclosers;
- an aggressive approach to line clearing (tree-cutting/trimming); and
- maintaining the equipment in each substation to set schedules.

Table 9.3: Annual Outages in Different Areas for 2021

SOUTH		NORTH		CENTRAL		EAST		TOBAGO	
Area	**Outages**	**Area**	**Outages**	**Area**	**Outages**	**Area**	**Outages**	**Area**	**Outages**
Princes Town	211	Maraval	223	Chaguanas	189	Sangre Grande	359	Scarborough	98
Penal	189	Diego Martin	200	Couva	167	Arima	357	Mason Hall	79
Mayaro	180	Santa Cruz	158	Cunupia	166	Toco	194	Mt. Irvine	64
Point Fortin	132	Morvant	114	Freeport	159	Manzanilla	179	Plymouth	63
San Fernando	125	Laventille	91	Grand Couva	104	St. Joseph	169	Bon Accord	57
Rio Claro	119	San Juan	72	Claxton Bay	80	Wallerfield	140	Moriah	44
La Romain	106	Petit Valley	71	Carapichaima	75	Valencia	122	Bethel	39
Moruga	106	Blanchisseuse	65	Carlsen Field	59	Cumuto	118	Patience Hill	38
Barrackpore	105	St. James	63	Charlieville	59	Arouca	115	Hope	37
Siparia	94	Cascade	62	Longdenville	56	Matelot	100	Mt. St. George	35

Prepared by the RIC

The Guaranteed Standards Scheme (GSS) is effective in ensuring a minimum level of service but provides little incentive for the service provider to improve beyond that threshold level. While the GSS protects all customers, inclusive of these worst served customers from long outages, it does not address the number of outages and thus, there is a need to take a more proactive approach to reduce the frequency with which these customers experience outages.

In the Draft Determination, the RIC had proposed to use the Direct Revenue Adjustment mechanism[39] for the "Number of Customer Interruptions per month" (Interruptions Incentive Scheme). This indicator is closely linked to approved projects in the Capex programme and was to be assessed annually to provide a continuous incentive to improve performance. Consequently, the target provided for no more than three (3) interruptions per month in any area of the country to improve service to worst-served customers over PRE2.[40] The total incentive payment to T&TEC for this mechanism was capped at $7.5 million during the relevant year, and the total penalty for this mechanism was capped at $10 million during the relevant year. This penalty cap ensures that the service provider's continued operation is not endangered in any way. The RIC also stated that it would adjust T&TEC's allowed revenue yearly before setting/approving T&TEC's tariffs for each subsequent year. This mechanism was to commence from the third year of the control period, thereby giving enough time for T&TEC to put systems in place (inclusive of an appropriate system to facilitate the submission of quarterly reports to the RIC).

Stakeholder Comments and Final Decision

T&TEC questioned the target of no more than three (3) interruptions per month by area and wanted to be assured that funding was provided to improve reliability.

The RIC acknowledges T&TEC's concern and recognises that clarity is needed on the manner in which this would be implemented. The RIC will require T&TEC to report performance in terms of outages at the level of the feeder; as such the target will be no more than three

[39] This mechanism rewards or penalises the service provider by directly adjusting allowed revenue in response to differences between the expected or target service level and the actual service level.

[40] An interruption is defined as "an operation of a fuse or switchgear, resulting in an outage to customers where the outage is unplanned and not of momentary duration as a result of the opening and successful automatic closing of the interrupting device.

interruptions per month by feeder. This would allow T&TEC to identify the specific networks where measures need to be taken to improve operational performance. As is the norm with other quality of service standards, the RIC will carefully consider the reason for breaches of the target before the application of penalties, which may be directed to finance reliability improvement projects on the worst performing feeders. The issue of reliability is a core concern for the RIC and sufficient funding was allowed for T&TEC to improve reliability.

The RIC's decision is that the Direct Revenue Adjustment mechanism for the "Number of Customer Interruptions per month" (Interruptions Incentive Scheme) will apply in instances where T&TEC fails to meet the target of three interruptions per month by feeder. The total incentive payment to T&TEC for this mechanism is capped at $7.5 million during the relevant year, and the total penalty for this mechanism is capped at $10 million during the relevant year. This mechanism is to commence from the third year of the control period, thereby giving enough time for T&TEC to put systems in place (inclusive of an appropriate system to facilitate the submission of quarterly reports to the RIC). The RIC will adjust T&TEC's allowed revenue yearly before setting/approving T&TEC's tariffs for each subsequent year. However, the RIC will consider what if any penalty may be directed to finance improvement projects on the worst performing feeders. T&TEC is also required to conduct a Study within 18 months of the publication of the Final Determination evaluating its performance on its worst performing feeders and the actions and resources needed to improve performance. Along with submission of the results of the Study, T&TEC will be required to submit and to action, no later than 18 months of the publication of the Final Determination, a management plan detailing the main factors that contribute to the performance on these feeders, the specific measures and resources required to improve performance, and the plan of action for T&TEC to meet the incentive target.

9.4 CUSTOMER RESPONSIVENESS AND SERVICE

In PRE1, the RIC introduced three major initiatives aimed at improving the quality-of-service customers receive from T&TEC:

- The Codes of Practice – a set of guiding principles that T&TEC must consistently use in dealing with specific consumer issues. They are designed to improve the delivery and quality of service to customers. The Codes were revised in early 2022 and can be found on the RIC's website;
- Benchmarking and monitoring the quality of supply – involves quantitative measures to be monitored regularly. The RIC publishes annual reports on these performance metrics, which are made available through the RIC's website; and
- The Customer Satisfaction Survey – a qualitative survey conducted at the beginning of each price control period by the RIC. The survey for PRE2 is scheduled to take place at the start of PRE2 and be completed by the end of the second quarter 2024.

T&TEC was required to establish a suitable system to track their Call Centre performance in PRE1, given the importance of the telephone as a medium of communication for T&TEC's customers, and to commence the collection of data against the specified customer service parameters listed below:

- total number of calls;
- number of calls not answered within 30 seconds;
- average waiting time before a call is answered;
- number of complaints received and resolved by type; and
- resolution time (average, minimum and maximum by complaint).

The RIC observed a reduction in the number of complaints in many areas and improved customer satisfaction over the period 2006–2020. However, although T&TEC undertook steps to establish and implement a system to capture the information, there were data accuracy and reliability issues in their Call Centre performance.

The RIC has initiated the process of establishing the appropriate Call Centre metrics for T&TEC. The selected key performance indicators (KPIs) are expected to transform the customer service experience and ultimately improve customer satisfaction. The KPIs will be grouped into the three (3) broad categories below:

- **Service Responsiveness –** a measure of how efficiently calls are being handed by Call Centre agents.
- **Call Quality –** a measure of the efficiency and effectiveness of conversations between the agent and customers. It is considered one of the most effective and efficient approaches to improving customer experience.
- **Customer Satisfaction –** a measure of how pleased customers are with the most important aspects of a positive Call Centre experience: fast call resolution, real–time support, and the agent's friendliness. The utility evaluates this category via a survey instrument.

The RIC considers the KPIs listed below, which fall under Service Responsiveness, to be of critical importance:

- **Service Level** – this metric commonly defines X amount of output in Y amount of time. Service Level (SL) is an effective KPI used to assess Call Centre efficiency. It is often used as a good indicator of customer service quality.
- **Average Handle Time** – one of the most commonly measured metrics. It indicates the length of time an agent spends working on a task and, therefore, cannot deal with a new work item.
- **Average Speed of Answer** – a metric that shows the amount of time it takes for an agent to answer a typical call once it has been routed to the contact centre, that is, from the ring tone up until the time an agent answers the call. It is one of the main factors affecting how customers judge the level of service, and it is often associated with customer satisfaction.
- **Call Abandonment Rate** – the percentage of inbound phone calls that are abandoned by customers before speaking to an agent. The rate is usually a reasonable gauge of the customer service experience. It measures how many customers terminate their call before it is answered in the call centre.

A comprehensive analysis is required to determine and establish the appropriate performance standards for the KPIs selected. T&TEC will be required to report quarterly to the RIC on its performance and thereafter the RIC will publish T&TEC's performance periodically as it sees fit. The project of establishing Call Centre Metrics for T&TEC is anticipated to be completed in 2023 and is expected to be implemented by the second year of PRE2.

The RIC will conduct a Customer Satisfaction Survey at the start of PRE2, to obtain general feedback from customers on the various aspects of the utility's service delivery. In addition, the Draft Determination required T&TEC to undertake an annual Customer Satisfaction Survey, commencing from the third year of PRE2. The survey must be administered by a third party but commissioned by the service provider, and should cover at least four areas: Voltage Complaints; Unplanned Outages; Planned Outages and New Connections. The survey must capture the customer experience and their perception of how their matter was handled rather than the nature of the issue itself. A random sample of customers who interacted with the service provider in the previous year will be interviewed, and T&TEC must submit a copy of the survey report to the RIC.

Stakeholder Comments and Final Decision

T&TEC noted that the proposed KPIs should align with the statistics of a utility industry as well as the capabilities/configuration of T&TEC's current Call Centre system. They were concerned, for example, whether the statistics pertain only to calls where the customer has opted to speak with an agent, as the system allows customers to make outage reports and receive outage information without talking to a T&TEC representative.

The RIC's approach to introducing any new regulatory policy has been, and will always be, to engage T&TEC before finalisation, and the implementation of the Call Centre Metrics would be no exception. A preliminary discussion has already been initiated, and information has been provided for guidance.

The implementation of Call Centre metrics and the Customer Satisfaction Survey will proceed as detailed in Section 9.4.

9.5 SYSTEM LOSSES

System losses are generally divided into technical and non-technical losses. Technical losses arise due to physical reasons and depend on the energy flowing through the network, the materials used to construct transmission and distribution lines, transformers, and the way the network is configured and operated. Non-technical losses, sometimes called commercial losses, arise when energy is delivered to customers, but no revenue is collected. These losses usually result from measurement errors, recording errors, and theft. Any reduction in energy losses will have positive economic and environmental benefits, as the generation of less electricity will lower the volume of greenhouse gases produced.

As part of PRE1, the RIC instituted a measurement and incentive mechanism for managing system losses to encourage T&TEC to manage its transmission and distribution network efficiently. This decision was a critical area for the RIC as, ultimately, consumers pay for energy losses throughout the network via their tariffs. Although some of the losses are unavoidable, they can be reduced (but never completely eliminated) by utilising suitable techniques and equipment. Other elements of the losses are avoidable, with accurate measurement of electricity consumption and good management of the network.

The specific directives on managing transmission and distribution losses in PRE1 defined the formula for calculating system losses and the terms and conditions of the incentive mechanism. The RIC used the following formula for the calculation of the total system losses:

$$\textbf{Total System Losses} = 1 - \left\{ \frac{\textbf{Energy Units Billed}}{\textbf{Energy Units Purchased}} \times \frac{\textbf{Collection in \$}}{\textbf{Billing in \$}} \right\}$$

The calculated system losses in Trinidad and Tobago were benchmarked against the system losses of selected countries.[41]

The RIC stipulated five conditions in the incentive mechanism for total system losses:

[41] The RIC, based on availability of data, looked at the following jurisdictions: Australia, Austria, Belgium, Botswana, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Jamaica, New Zealand, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, USA.

- The RIC adopted an initial level of total system losses of 7.9% for T&TEC based on the average value computed over 1999–2003, which at the time compared favourably with some developed countries. A target for reduction in loss levels for PRE1 was then set at 6.75%.

- T&TEC was allowed to keep 90% of the gains derived from savings realised, if the total system losses fell below 6.75%, with the sharing of these gains set to occur at the end of the regulatory control period.

- The RIC indicated support for the principle of taking into account the value of loss reduction measures into the asset base when it is to be rolled forward into the succeeding regulatory control period, to encourage investment in loss reduction equipment.

- T&TEC was required to install appropriate metering/monitoring equipment at strategic locations of its network during PRE1.

T&TEC's total system losses varied from year to year for the period 2006 to 2011, as presented in Table 9.4.

Table 9.4: T&TEC's Transmission and Distribution Losses 2006–2011

Year	**2006**	**2007**	**2008[42]**	**2009**	**2010**	**2011**	**Average**
% Losses	7.73	8.45	7.84	9.40	6.46	6.50	7.73

Calculated by the RIC

T&TEC was not able to achieve any sustainable reduction of total transmission and distribution system losses during the period. The annual system losses were above the 6.75% target for all years except 2010 and 2011 and averaged 7.73%, with the highest annual loss of 9.40%

[42] All computations for 2008 were based on data from the first three quarters of that year. The data for the last quarter was not used because T&TEC had conducted a retroactive billing exercise which resulted in the reporting of more **Energy Units Billed** than **Energy Units Purchased** for that quarter, thereby, resulting in a considerable and inaccurate decrease in the value of total system losses for the entire year of 2008.

recorded in 2009. Although the annual system losses showed improvement in the last two years, in aggregate, T&TEC did not achieve the set target of 6.75% for the reduction in loss levels for PRE1.

In the period that followed, 2012 to 2020, system losses averaged around 7.85%, as shown in Table 9.5. Except for 2012, all annual values were above the 6.75% level.

Table 9.5: T&TEC's Transmission and Distribution Losses 2012–2020

Year	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**Average**
% Losses	6.67	7.08	6.93	7.40	7.99	8.08	8.26	9.22	9.05	**7.85**

Calculated by the RIC

The initial improvement observed for this period may have been influenced by the use of the higher transmission voltage of 220 kV on part of the network, and this was introduced with the commissioning of the 720 MW combined-cycle power plant in La Brea, as well as the upgrade from 66 kV to 132 kV of the transmission lines from the Bamboo substation in Valsayn to the Gateway Substation in Port of Spain. It is estimated that if the set target of 6.75% was achieved and maintained throughout the entire period of 2006 to 2019, the reduction in total system losses would have saved T&TEC at least TT$315 million, or approximately TT$23 million per annum. System losses have been trending upward since PowerGen closed its power station in Port of Spain at the end of 2015. The average over the years 2016 to 2020 was 8.52%. Overall, the incentive mechanism was unsuccessful in stimulating T&TEC to reduce the total system losses either by the benefit derived from cost savings, or the additional benefit of retained gains that could have been realised by surpassing the target of 6.75% set by the RIC for PRE1.

The RIC posits that the level of losses on T&TEC's transmission and distribution system translates into higher prices for all customers, as T&TEC must purchase greater quantities of energy than that which is being consumed by its customers. This underscores the need to pay attention to this metric and take steps to reduce it as much as is technically and commercially possible. After initially reviewing the original formula for calculating the total system losses, the RIC was of the view that less emphasis could be placed on non-technical (commercial) losses because T&TEC had substantially reduced meter reading/recording errors on the network after Advanced Metering Infrastructure (AMI) was implemented. However, the RIC, having engaged T&TEC on its proposals for metering in PRE2, noted that most existing AMI meters were approaching the end of their useful life and meter accuracy has started to decline. Hence, the RIC proposes the continuation of the application of an incentive mechanism for managing the total system losses for PRE2, as a measure to encourage T&TEC to minimise those losses.

In the Draft Determination, the RIC stated that it believed that establishing an **annual reduction target,** instead of a target to be achieved over the full regulatory period, was more practical and would encourage compliance with the set target. **Failure to achieve the annual reduction target in any given year would incur a penalty of $10 million for that year.**

The incentive mechanism outlined in the Draft Determination required T&TEC to:

- Calculate **Total System Losses** as**:** $$\mathbf{1 - \left\{ \frac{\text{Energy Units Billed}}{\text{Energy Units Purchased}} \right\}}$$

- Set the base value of total system losses for the next regulatory control period as the average monthly value computed over the year preceding the commencement of the period, and set a target for an annual reduction in loss levels for the control period at 0.25% towards an overall target of 6.75% by the end of PRE2;
- Keep 90% of the gains if total system losses fall below the target set for that year, and share the gains at the end of the regulatory control period. However, given the current uncertainty in relation to the measurement of losses, no incentive payment will be made until the data has been verified to be accurate;
- Include in the capital expenditure programme, projects which entail:

    - The installation of appropriate metering/monitoring equipment at strategic locations of its network; and

- Network modification to reduce the level of total system losses, which include but are not limited to shortening the lengths of long distribution lines and the installation of capacitors on feeders.

The execution of these projects is to be given high priority during PRE2.

- Take into account the value of loss reduction equipment in the asset base when it is rolled forward to encourage investment in loss reduction equipment. The full cost incurred would be incorporated into the asset base if the annual target for actual total system losses is achieved, and the cost will be prorated for the partial achievement of the target. However, if the total system losses increase above the initial and successive values calculated by the RIC, T&TEC will be penalised by not having the value of installed loss reduction equipment included in the asset base, and a directive will be issued to institute loss reduction measures at no cost to customers in the following control period; and
- Report annually to the RIC on all the proposed initiatives taken to reduce losses beyond the investment in its capital programme.

Stakeholder Comments and Final Decision

There were a number of responses related to the issue of system losses with some lamenting the existence of commercial losses through theft, and the need for T&TEC to reduce such losses. One respondent emphasised that T&TEC must reduce losses to below 9% with a target of 7.5% being suggested, to be achieved mainly through reduction in commercial losses. T&TEC proposed an overall system losses target of 7.25% for PRE2 and a set base (2023) value of 8.5%, which was used to calculate an annual reduction target of 0.25%[43] however, T&TEC did not provide data or rationale to support its proposal adequately.

In establishing the incentive mechanism for PRE2, the RIC had to consider the target and mechanism set for PRE1, T&TEC's performance during PRE1 and its performance since that time, as well as the factors that impacted T&TEC's performance. The RIC thus believed that

[43] (Base value – Target Value)/number of years in control period, that is, (8.5%-7.25%)/5.

emphasis should be placed on an annual reduction target rather than a final target to be met at the end of PRE2 and this was reflected in the Draft Determination. In the five years covered by PRE1, T&TEC met the target of 6.75% for two of the five years. T&TEC was also able to out-perform that target at least once in the period between the end of PRE1 and 2020.

The RIC, therefore, carefully evaluated stakeholders' submissions and presents the following:

- Under the RIC's methodology for establishing the base year, in keeping with a 2023 start for PRE2, the average value for system losses for 2022 is 8.03%.
- The base value chosen under T&TEC's method does not represent the actual performance of the utility at the chosen reference point in time. Hence, it cannot be a fair basis on which to establish the base year value.

The focus of the mechanism for PRE2 is the rate of annual reduction, which was set at 0.25% or 25 basis points (that is one quarter of one percent). The RIC also clearly established that the base value of total system losses for the next regulatory control period would be the average monthly value computed over the year preceding the commencement of the period. Therefore, the core issues with respect to the system losses incentive mechanism for PRE2 are whether the RIC's proposal for the calculation of the base year is fit for purpose and that the chosen rate of reduction is reasonable.

While there may have been some efforts to reduce system losses, there has been no indication that T&TEC currently has in effect a comprehensive loss reduction programme and that the components of the technical losses are being measured, calculated and evaluated by T&TEC on a systematic basis. T&TEC will be required to submit to the RIC, no later than 10 months after the publication of the Final Determination, a comprehensive loss reduction programme detailing the measurement of the total system losses in terms of the technical losses on the Transmission, Sub-transmission and Distribution networks and the non-technical losses, the forecasted trajectory in the total system losses from the second year to the final year of PRE2, without the intervention of the loss reduction programme, and the proposed projects/initiatives to reduce the annually computed base values by the set annual rate. The implementation of the loss reduction programme shall commence from the start of the second year of PRE2 and the annual reporting requirement shall commence from the end of the second year of PRE2.

The RIC's final decision and <u>revised System Losses Incentive mechanism</u> will be as follows:

- The RIC to Calculate **Total System Losses** as: $$\mathbf{1 - \left\{ \frac{\text{Energy Units Billed}}{\text{Energy Units Purchased}} \right\}}$$

- The RIC to set the base value of total system losses during PRE2, annually, as the average monthly value computed over the preceding year. The RIC to set a target for an annual reduction in total system losses over the control period at 0.15% or 15 basis points (i.e. the rate of 3/20th of a percentage point of the computed base value);

- T&TEC to share in the gains at the end of the regulatory control period, if total system losses fall at a rate which exceeds the set annual reduction rate. T&TEC will be allowed to retain 90% of the gains and 10% will be passed on to customers;

- T&TEC to identify the scheduled capital projects to reduce system losses which may entail:
  - The installation of appropriate metering/monitoring equipment at strategic locations of its network; and
  - Network modification to reduce the level of total system losses, which include but are not limited to shortening the lengths of long distribution lines and the installation of capacitors on feeders; after appropriate cost benefit justification.

The execution of these projects is to be given high priority during PRE2.

- The RIC to take into account the value of loss reduction equipment in the asset base when it is rolled forward to encourage investment in loss reduction equipment. The full cost incurred would be incorporated into the asset base if the annual target for actual total system losses is achieved, and the cost will be prorated for the partial achievement of the target. However, if the total system losses increase above the initial and successive values calculated by the RIC, T&TEC will be penalised by not having the value of installed loss reduction equipment included in the asset base, and a directive will be issued to institute loss reduction measures at no cost to customers in the following control period;
- T&TEC must report annually to the RIC on all the proposed initiatives taken to reduce losses beyond the investment in its capital programme; and
- T&TEC to have the loss reduction programme document and the annual reports verified by the "Reporter", the independent consulting expert.

The RIC will employ the System Losses Incentive Mechanism as described under the final decision for the revised System Losses Incentive Mechanism. T&TEC will be required to submit to the RIC, no later than 10 months after the publication of the Final Determination, a loss reduction programme detailing the measurement of the total system losses in terms of the technical losses on the Transmission, Sub-transmission and Distribution networks and the non-technical losses, the forecasted trajectory in the total system losses from the second year to the final year of PRE2, <u>without</u> the intervention of the loss reduction programme, and the proposed projects/initiatives to reduce the annually computed base values by the set annual rate of 0.15% or 15 basis points. The implementation of the loss reduction programme shall commence from the start of the second year of PRE2. T&TEC must report annually, commencing from the end of the second year of PRE2, on its performance to reduce the total system losses detailing the components of the technical losses, report on any adjustment in the forecasted trajectory based on relevant developments in the preceding year, and report on the loss reduction activities undertaken in the year of review and the capital investment on relevant works that was beyond the works identified in its approved capital programme.

9.6 GUARANTEED PAYMENTS

The RIC implemented a GSS in 2004 which outlined standards/targets. The standards are divided into guaranteed and overall standards. In the case of guaranteed standards, if the service provider fails to meet these targets, it makes a payment to the affected customers. This scheme provides both an incentive for the service provider to improve performance and guarantees payments to customers who receive poor service against any of the guaranteed standards. The standards have been revised since inception with the most recent version implemented in 2021. The current scheme includes a new overall standard which targets reliability indicators and modifies the guaranteed standards related to voltage irregularities and new connections of supply. Details regarding the RIC's Quality of Service Scheme can be found on the RIC's website. These arrangements have not been modified further as part of the price review for PRE2; they are mentioned here only for information purposes.

9.7 REGULATORY ACCOUNTING GUIDELINES (RAGs)

All businesses are required to comply with a range of reporting requirements, inclusive of statutory accounts. Regulated utilities are normally required to submit regulatory accounts, in addition to statutory accounts. These accounts are required for specific regulatory purposes and differ from statutory accounts, as they incorporate accounting information as well as other performance indicators. Regulatory accounts are a critical source of information for the RIC, as they help ensure that the service provider is in compliance with the RIC's decisions, and can be used to inform customers and other stakeholders about the performance of the service provider.

Regulatory Accounts will enable the RIC to:

- measure actual performance against forecast;
- inform future price determinations;
- ensure the correct allocation of revenue and costs between customer classes;
- publish information on the performance of the service provider;
- improve the level of transparency in regulatory processes; and
- give effect to the objectives of the RIC, as stated in Section 6 of the RIC Act.

In its Final Determination for PRE1, the RIC indicated that it would publish regulatory accounting guidelines and require T&TEC to submit regulatory accounts. Pursuant to this decision, the requisite guidelines were published, and T&TEC was mandated to submit the information in the required format. However, upon review of the various submissions, it was clear that T&TEC has not yet been able to meet the RIC's expectations. T&TEC has indicated that this was due in part to the difference between the financial reporting year, in respect of its statutory accounts, and the regulatory year. The RIC will align the reporting requirement for **financial information** to T&TEC's statutory year-end accounts to mitigate this problem

The RAGs required for submission by T&TEC are shown in **Annex 3**[44] at the end of this document.

Publication of Regulatory Accounts

The RIC Act (Sections 56-60) attaches significant importance to improving transparency and accountability, and mandates that "information collected and the results of the research carried out, be furnished to any person." As a consequence, the RIC, in the Draft Determination proposed:

- placing approved regulatory accounts on its website and making hard copies available on request;
- publishing a condensed version of the regulatory accounts in a daily newspaper. The RIC is of the view that information about a monopoly business (in relation to regulatory accounts) should generally be subject to full disclosure and full publication of regulatory accounts would not damage the service provider's interests because the requested information is not commercially sensitive; and
- **requiring T&TEC to submit quarterly information in the format of the RAGs, and full-year regulatory accounts to the RIC by the end of the third month of each year within the regulatory control period.** The full-year regulatory accounts must be reconciled with the quarterly submissions, as necessary. The RIC considered this to be an appropriate time frame, as undue delays in publication would negate the benefits or,

[44] The information shown in the Annex is subject to change as and when policies e.g., Codes of Practice are updated/revised.

at minimum, reduce its immediate significance. The RIC also required that the regulatory accounting information be submitted in hard copy and electronic formats.

Information Verification and Independent Assurance

The Draft Determination also specified that the service provider should maintain reporting arrangements which would provide information that could be verified. The service provider should:

- Provide a responsibility statement, signed and dated by the General Manager or a designated senior officer of the service provider, confirming that the information being submitted was accurate and properly reflected its activities.
- From time to time, as required by the RIC, provide an independent assurance (audit) on information submitted. In this regard, the RIC will specify the required scope of any audit or other form of independent assurance. The audit must be undertaken by an independent expert nominated and paid for by the service provider but approved by the RIC.

Process for Revision of Regulatory Accounts

The Draft Determination also specified that the RIC would amend and expand the guidelines from time to time, when necessary, to meet the changing needs of the RIC, service provider or customers and to reflect evolving regulatory practice and experience. The RIC will, however, consult the service provider and other stakeholders as appropriate before making any adjustments to these guidelines.

Stakeholder Comments and Final Decision

In its response, T&TEC noted that to accommodate the requirements under the RAGs, it would need to maintain two (2) sets of accounts which imposes a significant administrative burden and also disagreed with providing the RAGS in hard copy. T&TEC proposed to submit the yearly RAGS by the end of the sixth month as opposed to the third month of each year, and requested further clarification on the numerous requirements of the RAGs report but did not specify any specific areas of concern. T&TEC also did not agree to the

RIC's proposed requirement of an independent assurance exercise on the information submitted, nor that it should be at T&TEC's cost.

The RIC understands the concerns but notes that there is not a single jurisdiction practising incentive regulation or otherwise, that does not require the submission of some type of regulatory accounts, as statutory accounts either do not provide the detail required or the information in the format required by the regulator to do its work. However, the RIC will accept the final RAGs as an electronic copy provided it is certified by T&TEC's General Manager or a designated senior officer, confirming that the information being submitted is accurate and properly reflects its activities in the format set by the RIC. It is also standard practice for the regulated entity to fund the cost of the expert and in the interest of the public, the RIC's position remains unchanged.

The RIC's decision is that T&TEC is required to submit regulatory accounts as detailed in Section 9.7. However, the submission can be electronic but must be certified by its General Manager or a designated senior officer of the service provider.

9.8 PERFORMANCE REPORTING

Information, reporting and compliance are and will remain central to effective regulation during PRE2. The RIC considers that performance reporting enhances the effectiveness of its regulatory regime, as it promotes the transparency and accountability of the service provider through:

- **Education** – Access to the information will encourage a greater understanding of and participation in the regulatory process. It will also educate stakeholders on the service provider's performance and the outcomes of regulatory processes.
- **Transparency** – Performance reporting promotes transparency and allows for comparisons to be made over time, and between service providers, where possible. It will also provide an insight into the service provider's operations, practices and decision-making.

- **Accountability** – Performance reporting enhances accountability through outcomes monitoring and provides information to all stakeholders with the opportunity to assess the actual performance of the service provider against the specified performance targets.
- **Improved Performance** – Performance reporting enables comparisons to be made over time, and encourages the service provider to adopt more efficient processes, thereby providing an incentive to increase service performance.

The information may be reported using internal or external benchmarks, and will afford the regulator an opportunity to "name and shame" the service provider for poor performance. The RIC has already established a **"Performance Monitoring and Reporting Framework (PMR)"**, which is a significant performance driver and a useful tool for:

- informing customers and other interest groups about the level of service they are receiving;
- providing information and data for developing regulatory standards where required and for on-going assessment of compliance with such standards;
- informing the decision-making processes of regulators; and
- identifying baseline performance of service providers as well as comparing relative performance with other utilities.

The RIC will continue monitoring the performance of T&TEC using the relevant performance indicators and T&TEC is to continue to supply all relevant information needed for this. However, in the Draft Determination the RIC indicated that it would initiate a number of measures to improve its monitoring and reporting activities. Among these were:

- reviewing and modifying the templates used to collect data from T&TEC to ensure greater relevance in the data reported;
- requiring T&TEC to employ an independent expert to review its data collection and dissemination process, and to verify that the data and computations used to derive the values of the indicators are both valid and reliable. The expert should be hired, and the report submitted to the RIC by the third year of PRE2. The RIC will also determine whether that the independent expert's report would be made public;

- the employment of all its enforcement powers contained in the RIC Act, to obtain timely and reliable information from the service provider, including:
  - caution letters;
  - publication of non-compliance notice in the media; and
  - any other action necessary to achieve compliance;
- reporting on an abbreviated list of major indicators at six-month intervals to give a snapshot of the performance and financial health of the service provider. In order to create a broad picture, "traffic signal" indicators were chosen to cover **financial health**, **reliability**, **operational efficiency** and **customer responsiveness**. The rationale behind the list of indicators chosen is to depict the overall health and performance of the service provider using no more than six (6) indicators – the RIC has selected five (5) – that are of interest to customers and other stakeholders and easily understood by them (see Table 9.6 below); and
- the inclusion of the above "traffic signal" indicators in the electricity bills of customers once annually.

Table 9.6: List of Major Indicators

INDICATOR	What it Measures
Total System Losses (Transmission & Distribution)	The amount of electrical energy that is lost in the system
Current Ratio	Financial Health – Liquidity
System Average Interruption Frequency Index (SAIFI)	Reliability
Customers per Employee Ratio	Operational Efficiency of the company
Written Complaints Response Rate	Customer Responsiveness

Compiled by the RIC

The RIC also indicated that it will continue to produce and publish on the RIC's website its Performance Monitoring Report, which scrutinises and provides an in-depth analysis of the T&TEC's operation in keeping with the RIC's regulatory role. In addition, a more reader-friendly version of the report that could generate public and media discussions will be prepared. This report will also be published in other media, including social media platforms like Facebook and Twitter, to allow readers to post their comments. As indicated, the service provider is subject to a range of incentive mechanisms against which it can earn rewards or face penalties. The service provider also faces a number of specific obligations/targets which can attract penalties if not met. Table 9.7 presents a summary of these incentives.

Table 9.7: Incentive Mechanisms in Effect/Proposed for T&TEC

Mechanism	Brief Summary
Opex and Capex Incentives:	
• **Efficiency Carry-over Mechanism**	Five-year rolling incentive for both Opex and Capex where the service provider retains the benefits from efficiency gains for a period of five (5) years, irrespective of the year in which the gains are made.
• ***Ex-post* Efficiency Review**	*Ex-post* Capex review to decide whether customers should be exposed to bearing costs based on prudency test.
• **Capex Safety-net (new)**	Annual review of allowed Capex to determine if the Capex underspend/overspend is greater than 20% of the allowance.
• **System Losses Incentive (revised)**	Penalty for not achieving a set target for reducing the level of losses on the system.
• **Capex Information Quality Incentive (new)**	Rewarding service provider for honesty in Capex forecasting.
Uncertainty Mechanisms:	
• **Re-openers**	Provision to open price limits during the price control period (e.g. if allowed revenue fell short by 10%).
• **Logging Up and Down**	Enables a revenue adjustment in the next control period for specified items or areas of expenditure.
• **Pass-through**	Provision for an uncontrollable cost pass-through.
Incentives Relating to Output Delivery:	
• **Reliability and Customer Service Incentives**	To improve performance in reliability and customer service (e.g. number and duration of interruptions, telephone call response).
• **Worst Served Customers (new)**	The incentive to improve service for those experiencing three (3) or more interruptions per month.
Guaranteed and Overall Standards Scheme:	Stipulating minimum binding targets in a number of areas (e.g., supply restoration, notice of planned outages, keeping appointments, etc.), with financial penalties.

Compiled by the RIC

Stakeholder Comments and Final Decision

T&TEC queried the need for an independent expert to verify its data collection and dissemination and also expressed concern that they were required to provide updates on the "traffic signal indicators" within bills, citing limited space on the bills.

The RIC wishes to point out that the use of independent third parties to provide assurance is normal practice in jurisdictions which utilise incentive frameworks. Further, the RIC wishes to clarify that T&TEC is to provide updates on the "traffic signal" indicators as a separate insert within the envelope containing the customer's electricity bill. In cases where customers access their bills digitally, the relevant updates can be presented as a pop-up feature on T&TEC's online portal.

The RIC's decision is that T&TEC is to adhere to the reporting requirements detailed in Section 9.8, inclusive of requiring T&TEC to employ an independent assurance expert to review its data collection and dissemination process, and to verify that the data and computations used to derive the values of the indicators are both valid and reliable. The expert should be hired, and the report submitted to the RIC by the third year of PRE2. The RIC will decide whether to make the independent expert's report public. The RIC will continue to produce and publish on its website its Performance Monitoring Report, which scrutinises and provides an in-depth analysis of the T&TEC's operation in keeping with the RIC's regulatory role. T&TEC is to provide updates on the "traffic signal" indicators as a separate insert within the envelope containing the customer's electricity bill once annually. In cases where customers access their bills digitally, the relevant updates can be provided as a pop-up feature on T&TEC's online portal.

9.9 ENFORCEMENT AND SANCTIONS

Designing and implementing sanctions are among the essential functions of any regulatory regime. A core function of economic regulation is the specification and enforcement of performance requirements. Performance requirements must be associated with sanctions of some kind for them to be effective. This is especially important in a regime using *ex-ante* price setting in which the service provider gains if it can find a way to reduce costs. There are a number of different types of sanctions, including:

- **penalties** – where the service provider pays a specified sum of money for each instance of non-compliance;
- **compensation to customers** – where the payments are made directly to the affected customers; and
- **an adjustment** – where the revenue requirement at the next control period is adjusted to reflect divergences of performance.

Some regulators adopt a regime of "deficiency points", where a pre-determined number of deficiency points accrue for each instance of a breach, and the regulator takes a specified action. The different levels of action corresponding to a different levels of deficiency points could involve:

- warning notice to the service provider;
- more intensive monitoring of performance at the service provider's expense;
- a requirement for the service provider to produce a remedial plan; and
- a full technical study by an independent expert at the service provider's expense.

The RIC experienced several challenges in incentivising T&TEC to implement and comply with some of the directives, critical decisions and recommendations for improved sector performance as articulated in RIC's PRE1 Final Determination. These challenges inhibited the sector's development and precluded the benefits envisioned for all stakeholders as embodied in the PRE1 Final Determination. The RIC is mindful that PRE1 was the first time that Incentive Regulation and a Revenue Cap were used in the regulation of the sector and that T&TEC may have required some time to become acquainted with the methodology. However, the RIC now considers that sufficient time has elapsed to allow the service provider to understand the methodology and become patently aware of the importance of meeting set targets. The RIC's experience provided useful insight into how positive incentives or "carrots" are sometimes inadequate, particularly in the case of utilities that are State-owned monopolies. The RIC is mindful that perhaps a combination of "carrots" and "sticks" may be more effective in such instances.

In this regard, the RIC has identified four (4) critical areas in which T&TEC's compliance and commitment must be paramount. These are:

- implementation of tariffs as and when approved by the RIC;
- meeting specific directives and targets;
- accountability, transparency and stakeholder participation; and
- submission of information as and when requested.

Where T&TEC fails to meet the required standards/obligations, the RIC will initiate an enforcement action consistent with best practices and within the provisions of the RIC Act. Some of the regulatory sanctions may include administrative actions and enforcement of the statutory powers as outlined below:

- **Additional Reporting** – Performance reports are generally undertaken annually. In case of repeated failures, the RIC will require more regular reporting by the service provider, outside the annual system. This may also include directives to the service provider to produce reports and make them public;
- **Investigation** – This will involve detailed investigation of the service provider's performance and data quality by the RIC's approved Expert; and
- **Enforcement and Fines** – The RIC will, if necessary, use this major sanction in keeping with Section 66 of the RIC Act.

10 MISCELLANEOUS AND OTHER REGULATED CHARGES

10.1 INTRODUCTION

T&TEC's revenue is derived from regulated and unregulated services, with the latter accounting for approximately 3.5% of total revenue over the last five years. Regulated services comprise electricity sales, miscellaneous services and incidental charges. Miscellaneous services include: disconnection/reconnection, meter installation and repositioning, visits for non-payments, repositioning of secondaries, and meter checks at the customer's request. Incidental charges include: service deposits, late payment fees, and capital contribution. Unregulated services currently include: the rental of poles and transformers, high voltage (HV) isolation, temporary supply, and installation/removal of pennants and banners.

Regulated and unregulated services are reviewed during a price review. Regulated services are examined to determine whether current charges remain adequate for the extant circumstances. The list of unregulated services is revisited to determine whether these should be brought under the purview of the regulator.

The sections below discuss specific issues relating to miscellaneous and other regulated charges.

10.2 MISCELLANEOUS SERVICES AND CHARGES

Miscellaneous charges are fees levied for non-routine services which are incidental to T&TEC's core service of providing electricity. The recovery of the cost of providing miscellaneous services is not usually factored under the price control mechanism used to set tariffs, as they do not collectively account for a significant proportion of T&TEC's total annual revenue (<1%). However, miscellaneous charges can significantly impact individual customers, particularly those in low-income groups. Therefore, the regulator protects consumers by ensuring that these charges are as reasonable as possible. Three issues must be considered when setting charges for miscellaneous services; these are discussed below.

A. Determining Miscellaneous Services

In PRE1, T&TEC had proposed that a procedure for introducing new services should be agreed upon. The RIC had argued that it did not seem possible, within the confines of its Act, to provide the flexibility to automatically adjust the list of services or charges within the price control period. The RIC's view was that the opportune time for changing the list of services was during a price review, owing to the process that had to be followed, including the need for public consultation. This view was reinforced by the impracticality of engaging in a separate determination exercise during the price control period to introduce a new service, given the very small proportion of income from miscellaneous charges relative to the total revenue of the service provider. Thus, the RIC's decision in PRE1 was to not provide the flexibility to automatically adjust the list of services or charges during the price control period. T&TEC did not raise this issue in its proposals for PRE2, but the issue remains relevant, as does the attendant concerns of the RIC.

Stakeholder Comments and Final Decision

The RIC received no dissenting views on this issue.

There will be no automatic adjustment to the list of current services or charges. The RIC's view remains that the list of miscellaneous services and their corresponding charges should be reviewed periodically.

B. Fee Structure for Miscellaneous Service Charge

In PRE1, T&TEC proposed the introduction of a price adjustment mechanism that could be utilised to allow for cost increases over the regulatory control period. The RIC maintains however, that any analysis of the "true cost" of delivering miscellaneous services would entail detailed and disaggregated cost analyses of the various operational and administrative activities required to deliver a particular service. This information would facilitate an appropriate cost allocation methodology to support the respective charges.

The RIC considered several options for the initial change in price (Year 1) and thereafter, the annual adjustment of these charges, including:

- by the annual change in the RPI. This option is the simplest approach and assumes that the costs of providing these services will change in line with general inflation;
- by the average annual increase in electricity prices under this determination. This option assumes that miscellaneous charges will increase at the same rate as overall costs; and
- by the annual increase in the operating expenditure portion of the revenue requirement. This option also assumes that miscellaneous charges will increase at the same rate as operating costs.

T&TEC did not propose any price adjustment mechanism or increase in Miscellaneous Services Charges, hence a detailed cost analysis of the disaggregated costs associated with miscellaneous charges was not available. Notwithstanding, since T&TEC's overall costs have increased over the last decade, it is reasonable to conclude that the cost to provide these services has increased since PRE1.

Therefore, the RIC, in the Draft Determination utilised the annual change in inflation as the basis for setting new starting charges for miscellaneous services, with the exception of Disconnection for non-payment. However, the RIC has reconsidered its position with respect to the Disconnection for non-payment and is of the view that the annual change in inflation will be the basis for all new starting charges for existing miscellaneous charges.

Final Decision

The RIC's decision is that the new charges to apply to the current list of Miscellaneous Services for PRE2 are as shown in Table 10.1.

Table 10.1: Miscellaneous Charges

List of Services	Existing Charges ($)	New Charges for PRE2 ($)
Meter check (at customer's request)		
- If found in working order	194.00	246.00
- If found defective	No charge	No charge
Visit for non-payment of account	234.00	297.00
Install meter and reconnect secondaries	194.00	246.00
Reconnect: disconnect and/or change meter	194.00	246.00
Reposition of secondaries	194.00	246.00
Change and/or reposition of meter	194.00	246.00
Disconnection for non-payment	118.00	150.00
Reconnection after disconnection for non-payment	118.00	150.00

Compiled by the RIC

Charges should reflect the full, efficient costs of providing these services. In the Draft Determination, the RIC required T&TEC to submit a detailed breakdown of the typical costs to provide the miscellaneous services that are on the current list, by the end of the second year of PRE2. At the same time, T&TEC should submit a customer impact analysis and must have regard to the impact of any changes on vulnerable customers, and ensure that customer impacts are not unreasonable. The information will be used to determine whether new charges for miscellaneous services are to be applied from the mid-point of PRE2. Changes to miscellaneous charges within PRE2 would only occur on evidence that existing prices do not cover the reasonable costs associated with the particular service, and after approval by the RIC.

Therefore, the charges will be established as follows:

Miscellaneous Charge = Base Cost + Direct Material Cost

Where:
- Base Cost is a portion of Business Unit Overheads (to be determined by the RIC in conjunction with T&TEC); and
- Direct Material Cost is the cost of materials used.

Stakeholder Comments and Final Decision

The RIC received no dissenting views on this issue.

The RIC's decision is that T&TEC must submit a detailed breakdown of the typical costs to provide the miscellaneous services that are on the current list, by the end of the second year of PRE2. At the same time, T&TEC must submit a customer impact analysis and must have regard to the impact of any changes on vulnerable customers, and ensure that customer impacts are not unreasonable. The information will be assessed to determine whether new charges for miscellaneous services are to be applied from the mid-point of PRE2. Changes to miscellaneous charges within PRE2 would only occur on evidence that existing prices do not cover the reasonable costs associated with the particular service, and after approval by the RIC. The RIC will utilise the following formula: Miscellaneous Charge = Base Cost + Direct Material Cost Where: - Base Cost is a portion of Business Unit Overheads (to be determined by the RIC in conjunction with T&TEC); and - Direct Material Cost is the cost of materials used.

10.2.1 Meter Checks

T&TEC tests the accuracy of meters at its discretion or at the request of the customer. Meter checks at the customer's request incurs a miscellaneous charge if the meter is found to be registering correctly.[45] In PRE1, the RIC decided that there should be at least one free meter test every five (5) years. The customer would be required to pay the fee established by the RIC for an additional meter check within the five-year period, depending on the outcome of the test. If the meter was found to be reading accurately, the customer would pay the fee but if the meter was found to be defective, there would be no charge.

The RIC engaged T&TEC on its proposals for metering in PRE2. On the basis of these discussions, the RIC noted that most existing AMI meters were approaching the end of their useful life and meter accuracy was starting to decline. The RIC has made provision in PRE2 towards the upgrade of the meter reading infrastructure and the replacement of 50% of meters over the five-year period. Because a significant number of existing meters will remain in use,

[45] Any meter found to be registering within a range of plus or minus 2% either fast or slow is considered as registering accurately.

the RIC will reduce the timeframe for a free meter check, since the probability of inaccurate meter reading will be heightened.

T&TEC must provide a free meter check every four (4) years instead of every five (5) years to customers. Where the customer makes another request for a meter check within the four-year period, the current policy will remain intact.

10.3 SERVICE DEPOSITS

A service/security deposit (SD) is a charge which safeguards the recovery of cost for electricity supplied to customers. Utilities impose SDs[46] for different reasons; the main rationale for having a SD is to minimise the risk of financial loss associated with bad debts arising from non-payment of bills by customers. Utilities and regulators worldwide consider the application of a SD as a fair and reasonable approach to mitigate such risks.

During PRE1, consumers raised two main areas of concern: the structure and value of the SD, and the payment of interest. The RIC addressed these issues following the recommendations from a Working Group which was established to discuss key regulatory issues. The RIC's decision in PRE1 was that the SD would attract no interest and the existing $95.00 charge would not be adjusted.

T&TEC proposed that for PRE2, the SDs for residential and commercial customers be increased to the value of two (2) billing periods, based on an average monthly kWh consumption of 627kWh for residential customers and 1,361 kWh for commercial customers. Also, for industrial customers, T&TEC proposed that the SDs should be double the existing rate (the higher of 75% reserve capacity and minimum kVA consumption).

In its consideration of T&TEC's proposals, the RIC, in the Draft Determination noted, the following:

[46] Most utilities include service deposits as part of their connection charging policy. A connection charging policy establishes how connection charges are set for customers for a new or modified connection to the network.

- Historically, some customers (tenanted and non-tenanted) of T&TEC have vacated their accommodation/building without settling their outstanding bills. T&TEC has already implemented measures to identify delinquent customers by assigning a unique customer number. Therefore, regardless of location, the payment history of the customer is identifiable by T&TEC thereby reducing the risk of bad debt. Also, with respect to tenanted arrangements, the RIC previously suggested that once it is legally permissible, T&TEC should advise the owner, at the time that a request is being made to change the name on the account to an occupier, that the owner (not the occupier) will be responsible for non-payment of the account.
- Some customers who have been responsible for illegal electricity consumption in the past may seek to be connected to a new supply. The RIC recognises that these customers are not typical. Therefore, appropriate risk-mitigating measures should be implemented by T&TEC to safeguard the utility from financial loss/risk presented by these customers when they request a new supply.
- In many jurisdictions[47], the SD is returned to the customers after a defined period where the customer has not defaulted in meeting its obligations to the utility. In several instances, this period is twelve (12) months for residential customers and twenty-four (24) months for businesses (inclusive of commercial and industrial). The RIC has also observed in other jurisdictions, that the accrued interest on the SDs held by the utility, is included in the funds that are eventually returned to the customer.
- T&TEC provided no basis for its proposal of the SDs being increased to the value of two billing periods, especially since all residential and commercial customers will be moving to monthly billing. The RIC notes that this change may require the timelines for disconnection to be reviewed.

The RIC recognises that SDs are linked to connection charging and will further consider this issue as part of the process of reviewing the feasibility of introducing connection charging. Notwithstanding, the RIC's view is that T&TEC's proposal[48] to increase the SD for residential and commercial customers is not reasonable, considering the quantum of the existing SD and

[47] These include various individual states in the USA.
[48] T&TEC proposed a service deposit of $580 for residential customers and $2,220.10 for commercial customers.

the impact of new rates on the proposed SD. Therefore, in the Draft Determination, the RIC had indicated:

- **For residential and commercial customers requesting a new account, T&TEC can increase the SD from the existing $95.00, to the value of one month's average bill for customers within the respective class** based on an average monthly kWh consumption of 627 kWh for residential customers ($234.30) and 1,361 kWh for commercial customers ($878.82). **This SD is to be retained by T&TEC for one year (12 months) and thereafter, returned to the customer.** The RIC and T&TEC will discuss how this is to be implemented including circumstances that may delay the return of the SD, conditions under which the requirement of an SD can be reintroduced, whether the SD should be returned to the existing account holder or applied to the account and other implementation issues. The SD will attract no interest for the period that it is retained by T&TEC. When implementing this new SD requirement for residential customers, T&TEC should use discretion when assessing customers that are considered to be vulnerable, such as, those in receipt of government pensions and other government grants.

- That there may be merit to doubling the existing requirement for industrial customers, given the greater financial loss that may be incurred by T&TEC if these customers default. However, the RIC's view was that effecting such a change may not be prudent at this time. **Therefore, for industrial customers requesting a new account, T&TEC could increase the SD to the value of one month's average bill (the higher of 75% reserve capacity or minimum kVA consumption). This SD is to be retained by T&TEC for one year (12 months) and thereafter returned to the customer.** The RIC and T&TEC will discuss how this is to be implemented. The SD will attract no interest for the period that it is retained by T&TEC.

Stakeholder Comments and Final Decision

T&TEC, in its comments, was of the view that the SD should correspond to the value of two bills as disconnections are only effected for customers with at least two outstanding bills. T&TEC also suggested that the value of the SD should be increased for tenanted

premises as these customers pose a higher risk of debt. T&TEC also indicated that it is limited in its efforts to recover debt from these customers as it is unable to force a landlord to provide a guarantee to their tenant's electricity account. T&TEC also asked the RIC to confirm if the SD for Commercial Rate B2 (formerly B1) is to be calculated using the minimum kWh of 5,000 kWh, and what would be the SD for High Density Customers. T&TEC also suggested that the SDs be returned to customers upon closure of the account and not after 12 months. T&TEC noted as well that they are unable to exercise discretion when implementing the new SD for customers that are considered vulnerable, but that the SD itself provides a level of protection from disconnection.

The RIC understands the concerns expressed by the Service Provider but is of the view that the average of one month's bill is suitable for most customers and strikes an appropriate balance between the needs of the customer (for affordability) and the service provider (reduce the risk of bad debt). Regarding tenanted premises, the RIC notes that these situations pose a greater risk to T&TEC; however, these are Residential accounts, and the requisite SD would be applicable. As a consequence, T&TEC may wish to explore other solutions to this issue.

The RIC agrees that the minimum bill of 5,000 kWh can be the basis of the SD for commercial rate B2 customers, which is equivalent to $3,385.00 (at the new rate). However, for High Density Customers, which is a new rating category, the RIC requires T&TEC to provide an appropriate recommendation for the SD charge, given the service characteristics of this category of customer. Once the SD for High Density customers has been approved by the RIC, it is to be retained by T&TEC until the account is closed, in keeping with current practice.

The RIC is cognisant that there are several implementation issues that must be resolved before the new charges for SDs become effective, and the RIC will consider the timeframe for return of SDs as part of this process. Other implementation issues to be resolved include how the new SD will affect existing customers and options for mitigating the impact of the new SD on low-income and vulnerable customers. However, until all implementation issues have been resolved, the current SDs remain in effect for residential, commercial and industrial customers.

The RIC's final decision is that the current SD charges and the conditions attached to these will remain in effect until such time that all implementation issues for the new service deposit charges are resolved, inclusive of the return of these SDs. The RIC agrees in principle that the service deposit for new residential and commercial B1 customers will be $234.30 and $797.16, respectively. This represents the value of one month's average bill at the new rates using an average monthly kWh consumption of 627 kWh and 1,361 kWh, respectively. The SD charge for B2 customers (formerly B1), in principle, will be $3,385.00, which represents, the minimum bill of 5,000 kWh. The SD charge for industrial customers, in principle, will be the value of one month's average bill (the higher of 75% reserve capacity or minimum kVA consumption). Further, T&TEC is to make an appropriate recommendation for the value of the SD for High Density Customers within one month of the publication of the RIC's Final Determination. Once the SD has been approved by the RIC for High Density Customers, it is to be retained by T&TEC until the account is closed. The new charges for SDs will become effective on date(s) to be determined by the RIC.

10.4 LATE PAYMENT FEE (INTEREST CHARGES)

The late payment of bills imposes costs on T&TEC, such as costs related to disconnections and field visits. In PRE1, the RIC introduced a late payment fee to allow T&TEC to recover the efficient costs incurred to treat with delinquent customers. The absence of a late payment fee would also reduce the incentive for customers to pay their bills on time. This could result in T&TEC having to send more reminder notices, thereby leading to longer delays between billing and collection. Late payment costs should be recovered from those customers who make late payments and not from all customers through tariffs. **Therefore, T&TEC is required to retain the late payment fee (interest charges) of 1.5% per month or part thereof and maintain the current conditions related to imposing a late payment fee**, that is, the late payment fee will only be levied:

- on or after a date at least 15 days after the due date;
- by informing the customer via a specific line item on the next bill; and

- where T&TEC seeks the recovery of undercharges for electricity consumption, in instances where the customer is deemed culpable, under the RIC's Code of Practice COP 4.4 (2).

However, the late payment fee must not be levied:

- during a period in which there has been an agreed extension of time between the customer and T&TEC;
- where a customer has made a billing-related complaint to T&TEC or the RIC, and that complaint has not been resolved;
- where a customer has entered into a deferred payment arrangement with T&TEC, in accordance with COP 2.4;
- where T&TEC seeks the recovery of undercharges for electricity consumption, in instances where the customer is not deemed culpable, under the RIC's Code of Practice COP 4.4 (1); and
- where a customer has been identified as experiencing payment difficulties under COP 2.3.

Stakeholder Comments and Final Decision

The RIC received no comments with respect to the continuance of the late payment fee.

The RIC's decision is that the late payment fee of 1.5% per month or part thereof will remain in effect. The current conditions related to imposing the late payment fee as described in Section 10.4 will continue to apply.

10.5 CAPITAL CONTRIBUTION

Capital Contribution is defined as an advance lump sum payment made to T&TEC by the customer to facilitate infrastructure works for an electricity supply. In essence, it is the customer's contribution to the capital cost of new network development. For instance, it may apply for partial or full payment of the capital cost to extend the network where a customer's premises are not located close to the existing network, or where the network is already fully used and new capacity is required.

A revised **Capital Contribution Policy (CCP) (2022)** is being rolled out in phases, beginning with industrial customers, and the RIC will monitor implementation of the CCP during PRE2.

Stakeholder Comments and Final Decision

Respondents raised two issues concerning Capital Contribution: one related to the payment of "rebates" and the second related to the contestability principle included within the Policy.

Like the CCP (2009), the CCP (2022) includes detailed tenets for the reimbursement of customers and T&TEC has responsibility to administer the reimbursement scheme. The CCP (2022) specified the conditions under which contestability applies and is intended to promote least cost provision of the service in the interest of the customer.

The Capital Contribution Policy (CCP) (2022) is to be rolled out in phases in agreement with the RIC and the RIC will monitor implementation during PRE2.

10.6 UNREGULATED CHARGES

Some services offered by the utility are currently unregulated by the RIC and these must be reviewed periodically, to determine whether they should be reclassified as regulated services. Services that are currently unregulated include pole and transformer rentals, high voltage (HV) isolation, temporary supply, and installation/removal of pennants and banners.

The RIC has examined the scope of these services against what is typically included under miscellaneous services and found that HV isolation, temporary supply, and transformer rentals are non-routine and incidental to T&TEC's core business. Therefore, in its Draft Determination the RIC had decided:

- that HV isolation, temporary supply and transformer rentals should be regulated going forward and further that T&TEC will continue to apply the existing charges that were set for these services as detailed in Table 10.2 below. Transformer rental services will continue at the existing rates.

Table 10.2: New Miscellaneous Services and Interim Charges

NEW Miscellaneous Service	Interim (2023) Charges TT$
HV isolation during normal working hours	4,689.36
HV isolation during weekends and public holidays	16,300.44
Direct single phase temporary supply	3,024.7
Direct three phase temporary supply	5,718.41
Temporary Supply (URD) "Stick in meter"	2,131.44
Transformer Rental Services	408.00-2,400.00*

* There is a range of monthly charges for transformer rentals, depending on size of the transformer.

- by the end of the second year in PRE2, T&TEC would be required to submit a detailed breakdown of the typical costs to provide HV isolation, temporary supply, and transformer rental services. This information would form the basis upon which the RIC may determine new charges to be applied by the mid-point of PRE2.

- that pole rentals and installation/removal of pennants and banners are not incidental to T&TEC's core business and, therefore, these services would remain unregulated in PRE2. It should be noted that even though pole rentals are generally considered non-distribution services and, therefore, are not subject to regulation, regulated assets (poles) that are paid for by customers of the utility are used to provide this service. Hence, customers who would have paid for these assets should benefit from this and the RIC has adjusted the revenue requirement in PRE 2 to account for income from pole rentals and other income not generally subject to regulation.

Stakeholder Comments and Final Decision

T&TEC disagreed with the RIC's decision to have these services regulated, citing the fact that customers can have these services provided by a contractor.

The RIC's decision, however, is based on the fact that these services are all incidental to T&TEC's core business and while T&TEC may have allowed for some contestability in the provision of some of these services, T&TEC remains with significant market power and has not demonstrated that contractors have had meaningful impact in any way.

The RIC's decision is that HV isolation, temporary supply and transformer rentals will be regulated, and T&TEC will continue to apply the existing charges for these services as detailed in Table 10.2. T&TEC must submit a detailed breakdown of the typical costs to provide these services by the end of the second year of PRE2. This information will form the basis upon which the RIC may determine new charges to be applied by the mid-point of PRE2. Pole rentals and installation/removal of pennants and banners will remain unregulated.

11 REVENUE REQUIREMENT

11.1 INTRODUCTION

One of the most important issues that must be considered when determining prices is the amount of revenue the service provider should be allowed to receive to provide services efficiently and earn a return on its asset base. This forecast (or notional) revenue requirement must be sufficient to cover:

- the operating and maintenance costs of the service provider;
- regulatory depreciation (or return of capital) to allow for the progressive use of assets;
- a return on the capital investment; and
- an allowance for working capital.

The RIC utilised the building-block approach to calculate the above cost items and allowances for the regulatory control period. This chapter combines the individual building-block components, discussed in detail in Chapters 3, 4, 7 and 8, to estimate the forecast revenue requirement. The incorporation of efficiency gains in the forecast revenue requirement allows the service provider the opportunity to fulfil its potential to improve the efficiency of its Opex and Capex, without reducing the quality of service. A well-defined and targeted efficiency intervention is considered an enabling factor to convert gains into cost savings. The efficiency savings that the RIC expects T&TEC should be able to achieve, are assessed in several ways, including through benchmarking with similar utilities. Any variations from forecast revenue, whether favorable or not, will either redound to the benefit or will be borne by the service provider.

11.2 CALCULATING REVENUE REQUIREMENT

Once the forecast/notional revenue requirement is established, any necessary revenue adjustments (either positive or negative) are made to arrive at the annual revenue requirement (ARR) forecasts upon which the price controls are based. These adjustments include offsetting non-tariff revenues and any other adjustments.

The functional form of the model utilised by the RIC for estimating the forecast revenue is shown below:

$$\mathbf{Rev._{Max} = WACC * (RAB + WC) + D + Opex_{TD} + PP + F}$$

where:

$Rev._{Max}$ = Maximum Revenue

WACC = Weighted Average Cost of Capital

RAB = Regulatory Asset Base

WC = Working Capital[49]

D = Depreciation

$Opex_{TD}$ = Operating and Maintenance expenditure for transmission and distribution (including internal generation)

PP = Purchased Power (conversion costs)

F = Fuel Costs

This functional form is consistent with the RIC Act, as Section 67(4) states that the RIC shall have regard to the following:

- replacement capital cost expended;
- least-cost operating expenses which may be incurred;
- annual depreciation; and
- return on the rate base.

In establishing the ARR for PRE2, the RIC utilised a cost of capital of 5.1%, straight-line depreciation (discussed in Chapter 3), operating and maintenance expenditure requirements, conversion and fuel costs (discussed in Chapter 7), and capital expenditure (discussed in Chapter 8). Table 11.1 summarises the major assumptions used in arriving at the revenue requirements.

[49] A detailed discussion on how Working Capital is calculated can be found in the RIC's Final Determination Document "Regulation of the Electricity Transmission and Distribution Document, June 1, 2006 to May 31, 2011," page 150, which is available on the RIC's website, www.ric.org.tt

Table 11.1: RIC's Major Assumptions for Determining Revenue Requirements

Variable	Main Assumptions
• Personnel Costs	Wages and salaries to increase by 2% per year.
• Repairs and Maintenance Expenses (R&M)	Set at 1.5% of gross fixed assets for transmission assets and 2.5% of gross fixed assets for distribution assets.
• Generalised Efficiency Factor	2% efficiency gains per annum on Opex (Transmission and Distribution).
• Cost of Capital	Set at 5.1%, to be applied to RAB, inclusive of new Capex.
• Return on RAB	No return on equity. No return on inflation indexed part of RAB.
• Macro-economic assumption	Inflation (core) rate of 4.7% per year.

To calculate the revenue to be recovered from tariffs, the RIC made a number of adjustments to the forecast (notional) revenue requirements. Consistent with PRE1, non-tariff income from shared assets (e.g. rental of poles) was removed from the revenue requirements.[50] Another adjustment was made to account for the periodic dividends received by T&TEC from its investment in PowerGen.[51] Since T&TEC received subventions from Government, the assets in question are essentially paid for by taxpayers who are also rate payers. As a result, the RIC has determined that any returns from these assets should be returned to the rate-paying base. Therefore, no return on capital was included in the forecast revenue for those assets.

Stakeholder Comments and Final Decision

One respondent suggested that the income from T&TEC's pole rentals should be "netted off" from the revenue requirement.

This has been the RIC's approach since PRE1 and it will continue in PRE2, as discussed above.

The annual revenue requirements for PRE2, 2023–2027 are detailed in Table 11.2 below and reflect the changes in operating expenditure discussed in Chapter 7.

[50] The revenue adjustments can also be made based on the service provider's "unders and overs" account, as well as for items such as disposal of assets, change in asset lives, etc. These deductions ensure that customers do not contribute twice to the revenue requirement.

[51] T&TEC's shareholding in PowerGen was derived from the sale of the generating assets from T&TEC to PowerGen in December 1994. Consideration for the generating assets was in the form of majority ownership (51% shareholding).

Table 11.2: T&TEC Requested and RIC Approved Forecast Revenue Requirements, 2023–2027 ($Million)

	T&TEC REQUESTED	**RIC APPROVED**	**2023**	**2024**	**2025**	**2026**	**2027**
Conversion Cost	9,612.93	9,431.67	1,764.99	1,788.45	1,936.61	1,957.72	1,983.90
Fuel Cost	10,564.19	10,035.97	1,752.22	1,859.74	2,023.37	2,139.51	2,261.13
T&D Cost	6,663.11	5,150.13	1,013.73	1,051.54	1,046.33	1,030.73	1,007.80
Depreciation	1,844.44	1,399.70	279.27	279.02	280.55	280.03	280.83
Return on Capital	1,466.88	1,447.90	282.97	287.35	290.00	291.82	295.76
Return on Working Capital	140.33	12.63	1.53	1.54	1.56	3.99	4.01
Unsmoothed Revenue Forecast	**30,291.88**	**27,478.00**	**5,094.71**	**5,267.64**	**5,578.42**	**5,703.80**	**5,833.43**
Less: Revenue from Non-Tariffs*	1,000.00	1,005.00	201.00	201.00	201.00	201.00	201.00
Unsmoothed Rev. Req. before NGC Debt	**29,291.88**	**26,473.00**	**4,893.71**	**5,066.64**	**5,377.42**	**5,502.80**	**5,632.43**
Add: NGC Debt	-	1,157.42	-	-	-	578.71	578.71
Unsmoothed Rev. Req.	**29,291.88**	**27,630.42**	**4,893.71**	**5,066.64**	**5,377.42**	**6,081.51**	**6,211.14**

***This includes dividends, capital contributions, pole and transformer rentals, asset disposal, etc.**

Calculated by the RIC

The RIC's approved revenue requirement, exclusive of NGC debt, is $2,818.88 million lower than T&TEC's proposal over the five years of this regulatory control period. This difference reflects a number of decisions to ensure efficiency and prudency, including reductions in:

- forecast of operating expenditure ($1,512.98 million):
- conversion ($181.26 million);
- fuel costs ($528.22 million); and
- depreciation charges ($444.74 million).

The RIC included $1,157.42 million into the revenue requirement to cover a portion of the outstanding sum of $3,832.50 million payable to the NGC for natural gas purchased over the period 2019–2022. The remainder of the debt, provided that no alternative arrangements are made to settle same, will be treated within the control period which follows PRE2. The total revenue requirement shown in Table 11.2 is considered sufficient for T&TEC to adequately meet the expenditure required to effectively exercise its core functions and comply with quality-of-service standards and other RIC requirements for improvement in customer service. As indicated above, prices are set for individual services to recover costs once allowed revenue is established.

11.3 IMPLIED AVERAGE PRICE CHANGES

As a broad guide to pricing impacts over the control period, the implied real and nominal price increases are shown in Table 11.3 below. These "prices" (¢/kWh) are calculated by dividing the annual revenue requirements by the forecast level of electricity consumption. This is a notional price only and does not represent differences across and within customer classes.

Table 11.3: Implied Average Annual Price Changes, 2023–2027

	2023	2024	2025	2026	2027
Annual Unsmoothed Revenue Requirement ($Million)	4,893.71	5,066.64	5,377.42	6,081.51	6,211.14
Year-on-Year Percentage Change (%)		**3.53%**	**6.13%**	**13.09%**	**2.13%**
Forecast Consumption (GWh)	**8,509**	**8,805**	**8,897**	**8,992**	**9,089**
Implied **Nominal** Price ($/kWh)	0.58	0.58	0.60	0.68	0.68
Year-on-Year Percentage Change (%)		**0.0**	**3.4**	**13.3**	**0.0**
Implied **Real** Price ($/kWh)*	**0.50**	**0.49**	**0.50**	**0.55**	**0.55**
Year-on-Year Percentage Change (%)		(2.00)	2.00	10.00	0.00

***Base year 2015 (core RPI 4.7)**

11.4 REVENUE SMOOTHING AND CALCULATION OF THE X-FACTOR

11.4.1 Introduction

After determining the revenue requirements for each year, the RIC calculated the amount by which T&TEC's revenue can be adjusted in each year of the regulatory control period to generate the calculated revenue requirements, to smooth the revenue over the control period. As can be seen from Table 11.3, there is an increase in the revenue requirement of 3.53% between 2023 and 2024. The increase in the annual revenue requirement fluctuates each year thereafter, eventually decreasing to 2.13% between 2026 and 2027. It must be noted that the actual revenue of T&TEC for each year will depend on actual sales of electricity and costs and therefore might be greater or lower than forecast revenue requirements.

Under RPI-X regulation, the regulator determines the X-factor. The X-factor is the real change (inflation adjusted) in revenue or prices each year. To determine this X-factor, the regulator must determine:

- the form of regulation – the variable to which the RPI-X adjustment factor is applied; and
- the form of the X-factor – the way the X-factor will change across the regulatory control period.

11.4.2 Form of the X-Factor and Smoothing

In Chapter 2 the RIC indicated its preference to continue with a fixed (total) revenue cap form of regulation for PRE2. The fixed amount (cap) is usually subject to an annual adjustment for productivity gains (called the X-factor) and inflationary effects.

A core issue in setting the trajectory of prices is the relative value of X and the starting price level. By changing the value of X, the price control formula profiles the distribution of revenue over time, while maintaining the same net present value (NPV) of revenue. Therefore, the X-factor is used to smooth-out the allowed revenue over the control period, so customers are not faced with volatile tariffs.

The X-factor can be a constant value over the regulatory control period or a different value each year, or there could be an initial adjustment (commonly referred to as a P_0 adjustment) followed by a different X-factor in subsequent years. If the X-factor is to be the same for each year, the regulator must decide how the total revenue requirement must be "smoothed" over the regulatory control period to allow for the use of a stable X-factor.

In considering any revenue smoothing, the RIC must consider conflicting objectives. In particular, the RIC Act specifically requires that the service provider can earn sufficient return to finance necessary investment (that is, over the regulatory period and not necessarily in any given year), while having regard to the ability of consumers to pay rates.

There are four alternative approaches for calculating the amount by which revenue may be adjusted to deliver the forecast revenue requirements to the service provider over the regulatory period. These include:

- Net Present Value approach (NPV) – where a single X-factor is applied such that the service provider's expected revenue equals its forecast revenue requirement in NPV terms throughout the regulatory control period.

- NPV approach with P_0 adjustment – where revenue is allowed to move by a fixed amount in year one and then an X-factor is applied to revenue in the remaining years so that, in total, revenue value is maintained in NPV terms;
- Straight-line smoothing – where a single X-factor is applied so that prices change smoothly from the first to the last year (ignoring the intervening years) to ensure that the service provider's expected revenue equals its forecast revenue requirement in the final year of the regulatory period; and
- Hybrid P_0 adjustment with straight-line smoothing – where an initial revenue adjustment is allowed in the first year of the control period to move the expected revenue closer to the forecast revenue requirement. An X-factor is then set to target the service provider's expected revenue so that it equals its forecast revenue requirement in the final year of the control period (as under the straight-line approach).

In deciding which approach to use, the implications of each approach must be considered, including price stability; revenue recovery; incentives for efficiency and transitional issues going into the next regulatory period. A revenue-cap plan must begin from a "fair" starting point, providing the utility with a reasonable opportunity to recover its just and reasonable cost of doing business, including cost of capital.

Straight-line smoothing and net present value (NPV) smoothing methods are more commonly used in calculating a constant X-factor. The information requirements for both methods are similar and calculated in a similar manner. Straight-line smoothing solves for the level of X so that the smoothed revenue requirement for the last year equals the unsmoothed revenue in the last year of the regulatory period. In this approach, the service provider's revenue requirements during the intervening years may be higher or lower than the forecast revenue requirements.

NPV smoothing solves for the level of X so that the total smoothed and unsmoothed revenues are equal in NPV terms, where average revenue grows by RPI-X every year. In other words, NPV smoothing balances costs and revenues over the entire regulatory period and not just in the last year, as in the case of straight-line smoothing. Equating expected revenue and forecast revenue requirements in NPV terms, takes account of any timing differences in receipts and costs. For example, if a service provider is expected to earn more revenue than the forecast revenue requirement in the early years of the control period, then under this approach, the potential interest it can earn on the difference is effectively deducted from the forecast revenue requirement in later years. There is also the simpler "Average Growth Rate Smoothing" method which can be utilised to meet the stated criteria of price stability, revenue recovery and treat with transitional issues to the next control period.

Ideally, any smoothing approach should leave the service provider no worse off in real terms. To be fully consistent with the principles of incentive regulation, the revenue expected over the forthcoming regulatory control period should equate with the unsmoothed revenue requirements in NPV terms over the same period. It should also provide price stability and sustainability over the regulatory period and arrive at a revenue requirement in the final year that offers a prospect of a smooth transition into the next regulatory control period. These objectives may not always be met.

Stakeholder Comments and Final Decision

The RIC, as discussed in Chapter 2, only received one comment requesting further details on the X factor which were provided. However, the RIC received myriad comments requesting that consideration be given to reducing starting prices.

Considering this request, the RIC has made certain necessary adjustments to the trajectory of the smoothed revenue requirements.

The comparison of outcomes under the three methods is presented in table 11.4.

Table 11.4: Comparison of Outcomes of Smoothing

	NPV Smoothing	Straight Line Smoothing	Average Growth Rate Smoothing
Constant X-Factor (includes RPI)	6.0%*	6.1%*	6.2%*
Level of Revenue Recovery ($Million) (Unsmoothed)	($Million)	($Million)	(Million)
2023-4,893.71	4,893.83	4,897.47	4,902.20
2024-5,066.64	5,189.51	5,197.23	5,207.27
2025-5,377.42	5,503.06	5,515.34	5,531.33
2026-6,081.51	5,835.54	5,852.91	5,875.55
2027-6,211.14	6,188.12	6,211.15	6,241.20
Total -27,630.42	**27,610.07**	**27,674.10**	**27,757.56**
Revenue Recovery Over 5 years	**Almost full in NPV Terms**	**Over by $43.68**	**Over by $127.14**
Final Year Revenue Recovery	**Under by $23.02**	**Equal**	**Over by $30.06**

*Figures rounded to one decimal point

Calculated by the RIC

The results show that the NPV method would require revenues to go up by 6.0% (RPI+ X) for each year of the control period and the X factor is 1.3%, given that the RPI used is 4.7%. In the case of straight-line and average growth rate methods, it would require revenue increases of 6.1% and 6.2%, respectively. However, both the straight-line smoothing and average growth rate smoothing will over recover revenue by $43.64 million and $127.1 million, respectively, over the regulatory control period.

In essence, the NPV smoothing provides a more reasonable and acceptable balance of the interests of all stakeholders. In light of the above, the RIC utilised the NPV smoothing approach which achieves an equivalent NPV to the unsmoothed revenues.

NPV smoothing of T&TEC's annual revenue requirements eliminates year-to-year volatility while still returning the same amount of revenue (in NPV terms) over the regulatory control period, see Table 11.5.

Table 11.5: NPV Smoothed Annual Revenue Requirements, 2023–2027

	2023	2024	2025	2026	2027
Unsmoothed Revenue Requirement:					
- **$Millions**	4,893.71	5,066.64	5,377.42	6,081.51	6,211.14
% Change		**3.53%**	**6.13%**	**13.09%**	**2.14%**
Smoothed Revenue Requirement:					
- **$Millions**	4,893.83	5,189.51	5,503.06	5,835.54	6,188.12
% Change		**6.04%**	**6.04%**	**6.04%**	**6.04%**

Calculated by the RIC

Under the NPV smoothing approach the average revenue will increase by 6.04% per year (in real terms). Within this average revenue outcome, there will potentially be price changes for some customers on either side of this average. The price increases over the regulatory control period are expected to be matched, in broad terms, by improvements in service quality, in particularly the guaranteed quality of service standards.

The RIC's decision is to adopt the NPV smoothing approach as it allows the service provider to fully recover its revenue requirements, and minimise price volatility for customers.

11.5 ASSESSING FINANCIAL VIABILITY

11.5.1 Importance of Financial Viability Analysis

In this section the financial viability analysis of the price control settlement is undertaken. The central principle of financial viability analysis is that revenue requirements should allow the service provider a reasonable level of revenue to cover its operating costs, depreciation and provide a reasonable return on its capital base.

A key element here is the cost of capital. The cost of capital is the minimum rate of return that investors require on their investment, given the risk profile of such investment. Therefore, from a theoretical standpoint, an efficiently financed utility should be expected to attract sufficient funds to finance its functions, given an appropriate rate of return on both equity and debt.

However, capital investment programmes may be "lumpy", and an extensive Capex programme might leave a utility with temporarily low interest cover ratios. Consequently, regulators often use financial indicators and tests to adjust allowed returns.

There are two objectives of the financial indicator analysis. The first objective is to monitor the ability of the service provider to attract equity and its ability to raise debt financing and service its debt. Since no provision was made for equity, this is not a concern for the RIC at this time. The second objective focuses on the credit worthiness of the regulated business. This objective will be met if the cash flows implied by the regulated revenues can sustain a commercially satisfactory credit rating. The results of the financial analysis can also be utilised as a "check" on the initial RAB. For instance, if the service provider's initial RAB provides a level of financial performance that is high in comparison to other utilities, this could indicate that the initial RAB and associated revenue requirements are high.

11.5.2 Indicators of Financial Viability

The focus of an assessment of financial viability is the ability of an entity to meet its cash obligations. Therefore, the most relevant financial indicators are those that reflect the cash needs of the service provider. The financial indicators that reflect accounting identities, such as provisions and accruals are influenced by the entity's use of generally accepted accounting policies, and are likely to provide a misleading impression of the actual cash-based needs of the service provider. In fact, cash-based financial ratios are used by regulators and rating agencies in their assessment of the financebility of privatised utilities which are required to maintain strict credit ratings. Complying with all the ratios would not only be challenging but may not be appropriate for a State-owned entity, funded entirely by tariffs and debt. The RIC expects T&TEC to be broadly compliant with the target value for these ratios (see Table 11.6).

The cash flow-based indicators generally measure the ability of a service provider to service its debt burden. The trend of such financial indicators, considered as a package, is generally more important than the absolute figures for any indicator in any specific year. The revenue requirements have been set to allow T&TEC to maintain both an adequate level and trend of critical financial indicators, as well as to ensure that T&TEC can earn, on average, a return at least equal to the assessed (5.1%) cost of capital. There may be variations in the cash-based indicators from year to year, despite being allowed an adequate return on capital. This is due to the relative amount of debt at the beginning of the regulatory control period, as well as its type (for example, fixed or floating rate), maturity and cost.

Table 11.6: Projection of Key Financial Ratios for T&TEC, 2023–2027

Ratio	Purpose	Target	2023	2024	2025	2026	2027	Outcomes
Funds Flow Interest Cover (times) – [(FFO + Net Interest) / Net Interest]	Measures the level of protection the entity must meet its interest cost after paying its cash operating expenses.	>3	4.90	7.01	3.36	5.14	8.25	Values for all years above target. Hence, the ability to meet interest payments is satisfactory.
Debt Payback Period (years) – [Net Debt / FFO]	Measures the length of time that the entity could retire its debt if it devoted all funds from operations.	Between 5-7	24.84	18.07	17.43	11.94	8.34	Values for all years exceed the target but declining. Improvement should be realised.
Internal Financing Ratio (%)– [(FFO – Dividends) / Net Capex]	Measures the extent to which an entity has cash remaining to finance prudent capital expenditure.	>40%	11.%	13%	15%	23%	28%	Values for all years less than target but improving.
Return on RAB (%)- [FFO / RAB]	Net cash flow returns on the regulatory asset base. (Similar to the return on capital).	≥9	6%	8%	8%	11%	14%	Generally, values are satisfactory when compared to target.

Calculated by the RIC

Given T&TEC's current financial position and the fact that the cash-based ratios are mainly used by privatised utilities whose shares are traded on the stock markets, the ratios set out in Table 11.6 show that T&TEC's financial position is expected to be sustainable when considered as a package over the length of the regulatory control period. Even though all the cash-based financial ratios do not fully comply with target ratios, the majority are trending in the right direction.

12 ESTABLISHING PRICE CONTROLS

12.1 INTRODUCTION

A key step in the price review process is to identify the broad pricing approaches utilised to translate the revenue requirement into prices and to assess their impact on customers and the service provider. The RIC Act outlines the matters that it must consider in determining price levels, including the service provider's financial viability and the impact of prices on customers.

This chapter sets out the issues related to rate design and tariff structure. It also discusses how the service provider's revenue is allocated to recover costs from each end-user category. Finally, it presents the starting tariffs (base tariffs) for the first year of PRE2 and their impact on customer bills, T&TEC's financial viability, and the wider economy.

12.2 COST ALLOCATION

Cost allocation refers to setting prices for a particular group or class of customers to recover the service provider's costs. It includes determining the proportion of the total costs of the service provider that is recovered from a particular group or class of customers and particular components of a price (for example, fixed and variable charges) that a particular group or class of customers pays for the service.

Cost allocation normally involves assigning costs by utility function (e.g. generation, transmission, distribution), rate components (e.g. energy, demand, customer[52]), costing periods (e.g. peak, off-peak, non-time differentiated), and customer classes (residential, commercial, industrial). Three common approaches are used to allocate costs and set prices; a marginal cost approach, an average/embedded cost/fully distributed approach, and the avoidable cost/equity and social rate-making approach. All methods have advantages and disadvantages, and no unique method is used internationally and accepted as best practice.

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[52] Demand charges reflect the cost of meeting maximum demand; these costs may include the cost of capital and other fixed expenses associated with generating plants, transmission lines, substations, and part of the distribution system. Energy charges reflect the costs associated with the amount of kilowatt hours consumed, while customer charges incorporate the cost to the utility of a customer having access to its system.

The common approaches to cost allocation are outlined below:

- ***Marginal Cost-based Approach*** – the service provider's revenue requirement is achieved using marginal costs as the basis for class revenue development. This is done by determining what the revenue realisation would be if marginal costs[53] were charged as prices to each class and then comparing the total to the utility's revenue requirement. Almost certainly, the two totals will differ, as marginal cost pricing under conditions of natural monopoly, leads to the marginal price being less than the average price.

- ***Average/Embedded/Fully Distributed Cost Approach*** – revenue responsibility is assigned using the results of a cost-of-service study based on the historic, embedded costs of the utility. Generally, this method allocates costs by attributing them to a particular class of customers, and for costs that are of a common or shared nature, allocating those by cost-allocation rules/factors. This is the most common method used for cost allocation.

- ***Avoidable Cost/Equity and Social Ratemaking*** – costs recovered from each customer to cover at least the avoidable cost of providing the service, and that common costs be allocated so that each user bears a "fair" share of those costs.

T&TEC uses the Fully Distributed Cost Method for undertaking its Cost-of-Service Study. The costs directly associated with a customer class are assigned to that class and the remaining costs are then apportioned based on three steps:

- **Functionalisation** – assignment based on functional categories, e.g. generation, transmission and distribution.
- **Classification** – assignment by energy usage, peak demand and number of customers within the functional categories.

[53] The marginal concept in economics refers to the rate at which one quantity changes with respect to extremely small increases in another quantity. Marginal Cost is often distinguished between short-run marginal cost (SRMC) and long-run marginal cost (LRMC). SRMC is defined as the change in short run total cost (when at least one of these costs are fixed) for an extremely small change in output and long run marginal cost (LRMC) (when all costs vary) for an extremely small change in output.

- **Allocation** – assignment to customer groupings or classes after the costs have been functionalised and classified.

After functionalisation, deciding what predominant criteria should be employed to classify the cost is necessary. Under this method, if an account is predominantly (>51%) energy-related, it is classified as energy costs, and likewise, for demand-related accounts and costs. Accordingly, the network costs are divided into customer, energy (volumetric) and demand (capacity) costs. However, the allocation of demand cost is a complex issue. There are three methods for allocating demand cost:

- **Coincident System Peak Responsibility Method** – in this method the entire capital costs are imputed to those services that are rendered at the time of the system peak.
- **Non-coincidental Demand Method** – this method apportions capacity entirely based on kilowatts of load rather than on the basis of kilowatt-hours of energy in proportion to the maximum demands of the different classes, even though they may not coincide with the system peak.
- **Average and Excess Demand Method** – this method apportions costs based on two criteria, namely the average demand and the excess demand of the class. The average demand cost represents the cost of plant and other "capital type" expenses required to serve the system's average demand. This cost is divided among customer classes in proportion to their average demand. The excess system demand cost represents the additional costs to serve demand above the average. These costs are divided so that those customer classes with high excess demand in relation to their average demand bear the larger share. Utilities widely use the average and excess demand method, and is arguably the fairest method of allocating demand costs.

The revenue allocation for each class of customers, based on the fully distributed cost method is presented in Table 12.1. The fully distributed cost method is akin to the "impactor pays principle", in which costs are allocated to users of the service in proportion to the contribution that each group of users makes to creating the costs or the need to incur the costs. This principle ensures that electricity users meet the costs they impose on the system. This principle is slightly different from the "beneficiary pays principle", where charges would be paid by users on the basis of them benefiting from the service.

Table 12.1: Revenue Allocation by Class of Customer

	2023	2024	2025	2026	2027
Residential (45.40%)					
Allocation ($Million)	**2,222.01**	**2,356.27**	**2,498.64**	**2,649.60**	**2,809.69**
Customers (No.)	464,148	471,141	478,134	485,127	492,120
Consumption (kWh '000)	3,257,000	3,308,000	3,358,000	3,408,000	3,458,000
Commercial (11.40%)					
Allocation ($Million)	**557.86**	**591.56**	**627.30**	**665.20**	**705.39**
Customers (No.)	56,801	57,171	57,667	58,689	59,702
Consumption (kWh '000)	952,000	955,000	959,000	963,000	966,000
Industrial (37.85%)					
Allocation ($Million)	**1,851.94**	**1,963.83**	**2,082.48**	**2,208.30**	**2,341.73**
Customers (No.)	4,018	4,086	4,154	4,221	4,289
Consumption (kWh '000)	4,164,000	4,404,000	4,439,000	4,478,000	4,519,000
Street Lighting (5.35%)					
Allocation ($Million)	**262.02**	**277.85**	**294.64**	**312.44**	**331.31**
Consumption (kWh '000)	136,000	138,000	141,000	143,000	146,000
Total Revenue Requirement ($Million)	**4,893.83**	**5,189.51**	**5,503.06**	**5,835.54**	**6,188.12**

Calculated by the RIC

Stakeholder Comments and Final Decision

One stakeholder was of the view that the RIC should produce its own cost-of-service study and queried the use of the Fully Distributed Cost Model.

The RIC welcomes the query and wishes to point out that the RIC in its Draft Determination thoroughly explained the methodological approach used to determine the pricing principles and its method for determining the revenue requirements that apply to PRE2. In accordance with the RIC Act, the RIC must take the specific costs of T&TEC into consideration in its decision making.

The Fully Distributed Cost approach is the most common method for cost allocation in other jurisdictions and it is generally accepted that a service provider submits its cost-of-service study. The RIC is unaware of any regulator in the Caribbean that produces its own cost-of-service study and considers the Fully Distributed Cost approach acceptable for use in PRE2.

The RIC's decision is to use the revenue allocation as outlined in Table 12.1.

12.3 CROSS-SUBSIDY

The term cross-subsidy is often used to refer to a situation where one group of customers is charged more to lower the price for another group. However, this situation is not necessarily a cross-subsidy but can be variations of price differentiation not justified by costs. A more formal definition of cross-subsidy has been developed in economic literature and is based on the work of Gerald Faulhaber[54] who defined subsidy-free pricing and presented two tests for the existence of cross-subsidisation:

- a service is the recipient of a cross-subsidy if the revenue generated by producing the service is less than the incremental cost (IC)[55] of providing the service.

- a service is a potential source of subsidy if the revenue generated by providing the service is greater than the stand-alone cost (SAC)[56] of providing it. Whether or not such

[54] Faulhaber, G.R. (1975) Cross-subsidisation: Pricing in public enterprises, American Economic Review, 65(5) December, p. 966-77.

[55] **Incremental cost** – is the additional cost incurred by producing that service (in addition to other services the entity produces). Another way to define it is to ask, "what costs would be avoided, in the long run, if the service was no longer offered" Faulhaber, G.R. (1975). If revenue from each service is at least as great as the incremental cost of that service, then no cross-subsidy exists.

[56] **Stand-alone cost –** is the cost of producing that service in isolation. In the case of **common costs**, Faulhaber's tests require considering not only each individual service, but also each group of services. Common costs are defined as costs that are borne by a multiproduct firm that cannot be causally attributed to variations in the output of any single product or subset of products.

a service is an actual source of subsidy depends on whether or not the above first test is satisfied.

The incremental cost test is a **floor test** with two parts:

- Revenue from each service must at least equal its incremental cost for the service to not be the recipient of a subsidy.
- The combined revenue from all possible combinations of a firm's services must at least equal the incremental cost of providing those services.

The stand-alone test is a **ceiling test** with two parts:

- Revenue from each service must not exceed its stand-alone cost for the service to not be a potential source of a subsidy.
- The combined revenue from all possible combinations of a firm's services must not exceed the stand-alone cost of providing those services.

In the Draft Determination, the RIC discussed the calculation of cross subsidies and whether cross-subsidies existed as at 2022.

12.4 OBJECTIVES OF A TARIFF STRUCTURE AND KEY ISSUES

The most important issue to consider is the structure of electricity prices and the resultant impact/implications for both the service provider and customers in terms of:

- equity and fairness for customers;
- incentives for efficient use of electricity;
- the link between prices and costs and, therefore, economic efficiency;
- revenue risks and volatility for the service provider;
- the level of revenue raised from fixed charges relative to volumetric charges, including step increases in volumetric charges; and
- the impact on the environment.

The objectives of tariff structure and rate design generally include:

- **simplicity** – the tariff structure should be easy to understand. It is more likely that customers who understand the tariff structure will respond more appropriately to the price signals given by the structure;
- **social equity** – the tariff structure should be consistent with the social needs of the society. For instance, the price of electricity for essential use[57] should not be excessive, where excessiveness is defined in terms of the maximum bill that an individual pays as a percentage of their income;
- **cost recovery** – the prices should fully recover the costs of an efficiently operated utility (including an adequate return on capital/investment) but not over-recover costs; and
- **economic efficiency** – the tariff structure should encourage productive, allocative and dynamic efficiency, including the optimal use of scarce resources.

While the RPI-X formula provides the broad framework within which individual tariffs are set, it is the structure of the tariffs that has a more direct impact on consumers and consumption patterns. Thus, the tariff structure is fundamental and equally important as the change in the average tariff. In accordance with its mandate, the RIC has decided to establish a well-defined framework within which T&TEC must set tariffs and translate the RPI-X price direction into final prices paid by consumers.

The RIC Act contains a number of regulatory objectives that relate specifically to the establishment of price controls. Therefore, the principles/objectives that must be considered while designing the tariff structure have to be consistent with the Act as well as regulatory best practice. These objectives are detailed in Table 12.2 below.

[57] Affordability describes the condition whereby consumers can pay for utility services without foregoing the purchases of other goods and services that are essential to their livelihood.

Table 12.2: RIC Act - Objectives of Tariff Determination

Objective in the Act	Mechanism to meet the Objective
• Promote efficiency and economy **[Sections 6(1) (d) and 6(3) (a)]**	- Recovery of only reasonable costs of operation from customers (i.e. forward-looking costs). - Providing incentives to reduce costs and improve performance. - Designing tariffs that promote optimum level of consumption and avoid wastage. - Promoting quality and reliability of supply and service to customers.
• Ensure the financial viability and sustainability of the service provider **[Section 6(1) (c) and 67(3) (a) (b)]**	- Recovery of reasonable costs of operation and maintenance. - Recovery of capital costs including a reasonable return on investment. - Stable revenue stream.
• Tariff should be fair, just and non-discriminatory **[Section 6(3) (b) (c)]**	- Tariff should reflect the cost of supply of service provision. - No discrimination against any consumer(s) to burden them with unjustified costs. - Cost of providing different services should be shown separately.
• Ability of consumers to pay rates **[Section 67(1) (c)]**	- Promoting social equity and value for money. - Provision of targeted subsidies for lower income groups.

The above issues are discussed at length in the RIC's paper **"Principles of Rate Design and Tariff Structures"**.

12.5 TARIFF RE-BALANCING AND SIDE CONSTRAINTS

The RIC is required to consider several factors in arriving at its price control decisions, including the impact on consumers and economic efficiency. It is, therefore, common for regulatory arrangements to include a "rebalancing control" or "side constraint" that is intended to limit the extent of annual price increases to customers. Without side constraints, individual customers could face significant price movements from year to year.

Although the side constraints provide price stability for customers, they can have adverse effects in terms of the ability of the regulated firm to fully recover its revenue requirement.

The RIC's decision is that it will continue to incorporate a rebalancing control (side constraint) as part of PRE2 to provide price stability.

12.6 PROCESS FOR ANNUAL TARIFF APPROVAL

An integral part of establishing the tariff structure and the annual revenue requirements over the regulatory control period, is the process for annual tariff approval for T&TEC. This section discusses matters that need to be addressed for adjusting prices within the regulatory control period.

The price control mechanism/formula sets out the way prices will be adjusted annually to meet the forecast revenue requirements over the regulatory control period. At a minimum, the prices in each year of the regulatory control period will have to be adjusted by the rate of inflation and the X-factor. There may also be a case for adjusting prices where an unforeseen event that is outside the control of the service provider, impacts significantly on its costs during the regulatory control period. The RIC had proposed a Trigger mechanism to cater for such events.

An important feature of incentive regulation is that once the pricing mechanism/formula is established, the regulator does not adjust it within the regulatory control period, in the event of differences between the actual and forecast revenue requirements. Consequently, the service provider has to manage any differences between forecast costs, determined by the regulator, and actual costs during the regulatory control period. To the extent that costs differ, the service provider retains the benefits or bears the loss.

The RIC will require T&TEC to submit proposed prices at least three months before the beginning of each year of the regulatory control period and the RIC will give its decision within two months of the submission.

The service provider will be responsible for demonstrating compliance with the established pricing principles and any other requirements of the RIC's Final Determination. Therefore, its **"Annual Tariff Approval Submission"** must include the method of calculation and other necessary information for understanding the objectives and rationale of the tariffs to be implemented. Once the RIC approves new tariffs, the RIC's position in its Draft Determination had been that the service provider must inform its customers of the new tariffs at least two (2) weeks before implementation.

Finally, T&TEC must produce a report, on an annual basis, explaining how the tariffs had been implemented. The report must provide information on whether the RIC's recommendations/directives made in pricing policy reviews have been implemented, and reasons must be given for any non-implementation thereof.

Stakeholder Comments and Final Decision

There were no dissenting views on these issues. However, the RIC has reconsidered it position that the Service Provider must inform customers at least two (2) weeks in advance and has increased this to twenty-one (21) days so that customers are assured of adequate notice.

The process for the annual tariff approval will be as outlined in Section 12.6; however, customers must be informed of new tariffs twenty-one (21) days prior to implementation. T&TEC must also produce a report, on an annual basis, explaining how the tariffs have been implemented. The report must provide information on whether the RIC's recommendations/directives made in pricing policy reviews have been implemented, and reasons must be given for any non-implementation thereof. The report must be submitted one month after the end of the regulatory year.

12.7 OTHER TARIFF ISSUES

As part of its pricing submission for PRE2, T&TEC has proposed changes to the current tariff structure. The RIC also discussed a number of tariff issues and published its document **"Principles of Rate Design and Tariff Structures" for public comments in March 2022**.

The issues of demand-side management, time-of-use pricing, electric vehicle (EV) charging rates and the matter of a fuel adjustment mechanism are discussed in this section.

Demand Side Management

Demand side management (DSM) refers to measures or programmes undertaken by a utility that are designed to influence the level or timing of customers' demand for energy. This is done to optimise the use of available supply resources, thus postponing or deferring the need to add generating capacity. While there is currently excess capacity locally, T&TEC has indicated in its Business Plan that by 2029, it intends to enter into negotiations to contract more generation capacity. Any progress in DSM can help to defer the acquisition of additional capacity, which will redound to the benefit of customers. Therefore, DSM options can be a cost-effective way of relieving network capacity constraints and can improve capital efficiency with a flow of benefits to customers through lower costs. However, DSM raises issues that extend beyond the regulator's immediate role and requires action by the Government, service provider, and customers.

DSM programmes aim to achieve three broad objectives:

- **Energy Conservation** – the reduction of the overall consumption of electricity by modifying behaviour and habits;
- **Energy Efficiency** – encouraging customers to implement technology that require less energy to perform the same function; and
- **Load Management** – providing incentives to use electricity during off-peak periods, thereby reducing the quantum of additional capacity required to serve customers during periods of peak demand.

The RIC's primary focus is on using non-price DSM techniques[58], which are briefly discussed below.

[58] The RIC will continue its inclining block structure for residential customers to encourage conservation.

Non-Price Related DSM Techniques

- **Efficient Energy Use**

  Energy efficient appliances save energy, cost less to run and are environmentally friendly. The use of these appliances should be encouraged when customers are contemplating the changing out of these appliances.

- **Consumer Tips for Energy Conservation**

  The Service Provider must devise a comprehensive plan outlining its approach to educating the public about energy conservation techniques. Listed below are some basic examples of energy conservation techniques:

  - avoid leaving appliances on standby;
  - replace regular (incandescent) light bulbs with energy-saving ones (CFLs, LEDs);
  - fill electric kettles with just enough water for required needs;
  - keep air conditioned rooms closed and curtains pulled across windows;
  - set water heater thermostat at 60°C/140°F as hot water does not need to be scalding; and
  - encourage industrial customers to use three-phase instead of single-phase machinery and encourage them to employ power factor correction techniques.

The RIC is also doing its part by publicising conservation tips for consumers. However, the service provider can also implement initiatives for reducing household and commercial energy consumption. These initiatives can include:

- providing reasonably priced energy assessments, power saver kits and advice (currently there is a 150% allowance on the cost of energy audits if these are carried out by a certified energy efficiency consultant); and
- rebates to small businesses/households installing small-scale solar photovoltaic (PV) systems.

Stakeholder Comments and Final Decision

The issue of energy efficiency and conservation are important. One respondent indicated that the RIC should mandate that T&TEC roll-out energy efficiency and conservation programmes to the public to reduce electricity consumption.

The RIC understands the concern and had communicated this expectation to T&TEC. Nonetheless, the RIC has mandated that T&TEC devise a formal plan outlining its approach to educating the public about energy conservation techniques. The Plan, inclusive of specific measures/initiatives to promote efficiency and conservation, is to be submitted within six months of the publication of the Final Determination.

T&TEC must submit its plan outlining its approach to educating the public about energy conservation techniques, including specific measures/initiatives to promote efficiency and conservation, within six months of the publication of the Final Determination.

Time-of-Use Tariffs (TOU)

TOU rates fall under the umbrella of a time-varying rate structure[59], and they provide an alternative to traditional flat or linear rates.[60] **T&TEC is required to undertake and complete a comprehensive study on the feasibility of implementing TOU rates and provide the RIC with a report on its findings.**

Stakeholder Comments and Final Decision

One respondent was of the view that TOU rates should be included at the very start of the control period as it was believed that data for this analysis should already exist, as T&TEC annually creates a load duration curve to assess their loss of load expectation (LOLE).

[59] Time-varying rates consist of a few different forms that range in complexity, from the simplest (TOU rates), to more complex programmes such as Critical Peak Pricing (CPP) and Peak Time Rebates, and to the most complex and arguably most difficult to implement, Real Time Pricing (RTP). It is important to note that in some countries, such as Great Britain, the term "TOU" is used to broadly refer to all time-varying rates, inclusive of real time pricing. This is not the case in other jurisdictions such as the USA.

[60] This rate can also be defined as a flat, unchanging charge that allows the user to consume energy and pay a fixed amount to the utility. These rates are also sometimes called fixed rates.

While the RIC understands the view, it does not agree that TOU rates can be implemented from the onset of PRE2. In seeking to introduce a TOU rate programme, careful consideration must be given to how this programme is to be designed and implemented, both fairly and effectively. In general, utilities must ensure they educate customers on the operation of TOU rates, and explain how they can benefit from taking control of their energy use. In order to facilitate the rollout of TOU rates appropriate infrastructure must also be in place. Therefore, the regulator must make decisions on the following issues:

- Which class of customers should be offered TOU rates;
- Should TOU rates be mandatory (opt-out) or voluntary (opt-in);
- Should the rate periods adopted reflect hourly marginal costs. Consideration should also be given to how peak prices will incentivise behavioural changes and what impact this will have on the required revenue of the utility; and
- What should be the price differential between peak and off-peak? Consideration should also be given to customers with limited flexibility to shift or reduce consumption and special needs.

T&TEC must make a robust proposal to the RIC before implementing TOU rates. Such work should be undertaken after the implementation of starting tariffs for PRE2, as this will allow T&TEC to consider the impact of price changes on its load profiles. Moreover, it is understood that the existing AMI cannot support the rollout of TOU, and T&TEC would need to implement the necessary metering and network infrastructure to facilitate the effective deployment of TOU rates.

The RIC's decision is that T&TEC is required to undertake and complete a comprehensive study on the feasibility of implementing TOU rates and provide the RIC with a report on its findings within 24 months of the publication of the Final Determination. The RIC also reserves the right to require T&TEC to make appropriate proposals for TOU rates in due course. Such proposals, if and when required, should provide sound rationale and justification, clearly indicating which classes of customers are being considered for TOU, whether the TOU rates are optional or not and specifying the number and duration of the price-differentiated periods.

Electric Vehicle rates

Trinidad and Tobago is in the initial stages of EV adoption, with fewer than two hundred (200) EVs on the nation's roads at this time. In keeping with its commitment to reduce greenhouse gas emissions in the electricity generation, transportation and industrial sectors, effective January 1, 2022, the Government removed motor vehicle tax and value-added tax on the importation of battery-powered electric vehicles. Since Government policy is to promote the uptake of EVs locally, the RIC has addressed various regulatory issues below. It is hoped that the eventual replacement of some vehicles with internal combustion engines with hybrid or electric vehicles, will result in the consumption of less fossil fuels and reduce the emission of greenhouse gases.

Currently, individual EV owners can charge at home, subject to the applicable charges for residential customers. The RIC is mindful that over PRE2 the local scenario can change, and two areas need to be considered: the implementation of an appropriate EV charging rate for residential customers and applicable rates for a public EV charging network. In its Business Plan: 2022–2026 to the RIC, T&TEC made proposals regarding tariffs for EV charging. T&TEC's proposals and the RIC's response/views are outlined below:

- **T&TEC proposed that where any upgrade to the local network is required to facilitate EV charging, the customer should bear the cost entirely.** The RIC is not convinced that upgrades to the local network are required to facilitate EV charging in the near future. The RIC believes that Level 2 chargers[61] (which typically carry a 40-amp load), can easily be incorporated into existing household electricity infrastructure. Some customers have installed Level 2 chargers with the approval of the Government Electrical Inspectorate (GEI) and have safely operated this installation for sole use with no apparent burden on their local networks. The RIC is aware that where upgrades to the local network are required to facilitate EV charging on a commercial basis or for a

[61]The amount of electricity used to charge an EV is based on the size of charger used and the charging rate assigned to that specific EV model. EVs are charged by three main types of chargers: Level 1 and Level 2, and Level 3 Direct Current (DC)/fast chargers. Level 1 and Level 2 chargers use standard 110/120 and 240 volt outlets, respectively and are generally used for domestic/private charging. DC fast chargers use a 480-volt outlet and take a much shorter time to fully charge EV batteries.

private fleet of EVs (more than 2 EVs), the costs associated with same will conform to the principles outlined in the RIC's Capital Contribution Policy (2022).

- **T&TEC proposed that all tariffs for EV charging (residential and commercial) be based on energy usage that is measured by a separate meter, used solely for EV charging.**

  T&TEC's proposal that EV charging (for sole use) be billed by a separate meter will impose significant costs to these customers. Installing a separate meter can require costly upgrades to the customer's electrical wiring installation. Additionally, not all residences and businesses are owned by their inhabitants; installing a separate meter in such instances is an administratively burdensome process for the tenant and landlord, apart from the cost for electrical upgrades. Whenever tenants vacate these premises, removal of these installations is expected to will pose similar challenges. The additional burden and cost surrounding installation of a separate meter for sole-use EV charging may even preclude many potential customers from considering the purchase of an EV.

  The RIC views T&TEC's proposal of installing a separate meter as an unnecessary imposition of significant costs on customers, which will most likely be a disincentive to purchasing an EV. Notwithstanding, where customers own a private fleet of EVs – more than two (2) EVs – a separate meter must be installed, and the customer must bear the associated costs.

- **T&TEC proposed that initially, EV charging tariffs for public EV charging does not contain a demand charge component.**

  T&TEC proposed that Level 3 charging (service stations) be initially billed at the new B2 (formerly B1) rate, and not include a demand charge (at this time). The rationale is that "demand charges were designed for commercial and industrial customers" and "demand charges may unfairly penalise such owners (service stations) for brief and occasional demand spikes." T&TEC's proposal is that as EV penetration and utilisation of the Level 3 chargers increase, then a demand charge can be considered.

  In keeping with the principle that the rating categories should consider similarly placed customers, customers (commercial or industrial) who wish to offer public EV charging will have the relevant rate (and its components) applied to them, including any demand charge. Therefore, all non-residential charging stations are to be billed at commercial (which do not carry a demand charge) or higher rates depending on the rating category applicable to that customer.

- **T&TEC proposed that TOU rates be established for EV charging in the future.** The RIC understands that there are benefits to the electricity network and the environment from establishing TOU rates and has directed that T&TEC undertake a comprehensive study on the feasibility of implementing TOU rates twenty-four (24) months after the start of PRE2.

Stakeholder Comments and Final Decision

T&TEC indicated that if circuit augmentation is required for the additional load of EV charging, the costs should be fully borne by the customer. Additionally, T&TEC disagreed with the rates proposed by the RIC for EV charging, that is, where customers are charged based on their existing rate category. T&TEC provided no detailed justification for their position with regard to pricing.

The RIC's CCP 2022 states that the avoided cost principle will apply as the basis for sharing augmentation costs to residential and commercial customers, under this principle any costs associated with reinforcing or augmenting the network that would not have otherwise been incurred but for the new connection is the responsibility of the commercial or domestic customer in question and not T&TEC. This position accords with T&TEC's request.

With respect to rates, until such time as TOUs come into effect, the RIC maintains that customers (commercial or industrial) who wish to offer public EV charging will have the relevant rate (and its components) applied to them, including any demand charge.

The RIC's decision with respect to EVs remains as outlined in Section 12.7, that is, where customers own a private fleet of EVs (more than two (2) EVs), a separate meter must be installed, and the customer must bear the associated costs, and all non-residential charging stations are to be billed at commercial (which do not carry a demand charge) or higher rates depending on the rating category applicable to that customer.

<u>Fuel Adjustment Mechanism</u>

T&TEC in its comments has requested the re-introduction of a fuel rate adjustment clause.

In PRE1, the RIC had removed the fuel clause which had existed under the Public Utilities Commission, citing the fact that such a clause was not usually part of incentive regulation, especially in the context where the fuel price was not market driven. The RIC understands that Government, as a matter of policy, may wish to link the price of fuel paid by T&TEC to NGC to more closely reflect market prices in the near future. The Final Determination already provides for certain mechanisms to deal with uncertainty in cost items; however, the RIC wishes to reserve the right to introduce such a fuel adjustment mechanism, if the situation warrants. The RIC will detail and provide an opportunity for the public to comment on any proposed mechanism.

The RIC reserves the right to introduce a fuel adjustment mechanism, and will issue same for public comment before implementation.

12.8 RIC'S TARIFF PROPOSALS

12.8.1 Inclining Block Tariffs

The RIC continues to support an inclining block tariff (IBT) structure as it is likely to discourage wastage at higher levels of consumption, send better conservation signals and provide incentives for the sustainable use of electricity, while at the same time cater for the needs of the lowest consumers of electricity. These reasons were key drivers for the RIC's decision when it first introduced an IBT structure in 2006. However, because the IBT has been operational for some time, it is necessary to ascertain if the current configuration of the IBT remains fit for purpose.

Internationally, while applying IBTs has resulted in benefits to low income/low usage customers, the research is inconclusive as to whether inclining block structures have effectively achieved reduced electricity demand. In fact, electricity customers' consumption patterns are more likely to respond to changes in their incomes rather than to changes in the price of electricity. Therefore, the appropriate configuration for each jurisdiction will depend upon the number of customers, their associated average usage patterns, and the multiple priorities to be achieved by the tariff structure.

The analysis of IBT application in several jurisdictions shows that while IBTs have varied widely, there are some similarities in design across many jurisdictions, such as, in the choice of the number of blocks or tiers in the structure. In most jurisdictions where IBTs have been implemented, the number of blocks has been restricted to between two and three blocks. The choice of two or three blocks has been mostly to keep in line with the design principle of administrative simplicity. The outcome should ensure that each block/tier applies to a significant number of customers. Whether or not an additional block encourages conservation will depend on the distribution of customer usage, magnitude of price changes and the price elasticity of demand for electricity.

Based on experience from several jurisdictions, another common rule of thumb in IBT design is that the tariff applied to the largest block should be about two to three times the rate applied to the first block. This design feature is crucial to achieving energy conservation and encouraging efficiency, as the block should be significant enough to be noticed by customers. The steeper the rise between tiers, the more apparent the price differences are to customers, hence the greater the possibility of encouraging energy conservation and efficiency initiatives.

IBT implementation for T&TEC (2006–2020)

The inclining block tariff structure implemented by the RIC in 2006 (Table 12.3), was designed to achieve three main objectives. It was structured to ensure the protection of low-income consumers that are "generally" also classified as low-consumption customers. The first tier of the three-tiered structure offered a low tariff to cover households' bi-monthly basic needs for electricity. The IBT was also structured to promote energy conservation and efficiency, as higher tariffs were imposed for higher (above average) levels of residential consumption. Further, the tariff structure sought to achieve cost recovery for the residential customer class and to ensure revenue neutrality to the utility.

Table 12.3: Residential Block/Tier Structure Trinidad and Tobago, 2006 (bi-monthly)

Block (Tier) 1	Block (Tier) 2	Block (Tier) 3
Basic needs electricity consumption	Average Usage[62]	High electricity consumption
1-400 kWh	401-1000 kWh	> 1000 kWh
27 cents	31 cents	34 cents

At that time, 28% of residential customers used less than 400 kWh bi-monthly. The RIC considered benchmarking information and analysed the energy consumption of appliances in a typical household to meet basic needs, to establish the upper threshold of the lifeline (basic-needs) block. The second block was set at 401-1000 kWh, accounting for 45% of residential customers. The third block (>1000 kWh) accounted for the remaining 27% of customers. However, this situation changed with time as seen in Table 12.4 below for consumption data at the end of 2010.

Table 12.4: Residential Consumption Analysis for the Bi-Monthly Period November–December 31, 2010

kWh Range	No. of Customers	% of Total Customers	Cumulative %	kWh-Units	% of Total Units	Cumulative %
1-400	77,193	20.92	20.92	17,804,716	4.56	4.56
401-1000	160,466	43.48	64.41	108,238,167	27.69	32.25
1001-1500	62,845	17.03	81.43	76,506,986	19.58	51.83
1501-2000	28,606	7.75	89.18	41,891,763	10.72	62.55
>2000	39,957	10.82	100.00	146,389,526	37.45	100.00
TOTAL	**369,067**			**390,831,158**		

Source: T&TEC

Over the next ten (10) years, there were noteworthy changes in the consumption profile of residential customers, especially at the higher levels of electricity consumption, as shown in Table 12.5 below.

[62] Average bimonthly residential usage was 911 kWh in 2005.

Table 12.5: Residential Consumption analysis for the Bi-Monthly Period November–December 31, 2020

kWh Range	No. of Customers	% of Total Customers	Cumulative %	kWh-Units	% of Total Units	Cumulative %
1-400	80,304	18.59	18.59	16,436,654	2.87	2.87
401-1000	145,808	33.75	52.34	100,469,748	17.53	20.40
1001-1500	76,086	17.61	69.95	93,505,874	16.32	36.71
1501-2000	46,276	10.71	80.66	80,055,137	13.97	50.68
>2000	83,548	19.34	100.00	282,653,564	49.32	100.00
TOTAL	**432,022**			**573,120,977**		

Source: T&TEC

The data from Tables 12.4 and 12.5 show that the number of residential customers increased by 17%, from 369,067 in 2010 to 432,022 in 2020. This trend was also observed as kWh demand increased from 390.8 million kWh to 573.1 for the same period. There was a considerable shift in the number of customers and kWh consumption across the consumption bands of the inclining block. The percentage of the residential customer base that typically consumed 1000 kWh or less, decreased from 64.4% in 2010 to 52.3% in 2020. Correspondingly, the percentage of residential customers that consumed over 1000 kWh bi-monthly increased from 35.6% in 2010 to 47.7% in 2020.

In 2020, 83,548 or 19.34% of the 432,022 residential customers consumed >2000 kWh of electricity bimonthly. Notably, this group of customers consumed 49% or 282.6 million kWh of cumulative residential electricity consumption. This fact is significant considering that in 2010, 39,957 customers were consuming more than 2000 kWh, and these customers accounted for 37.5% of cumulative residential electricity consumption.

As noted in the RIC's March 2022 technical paper on tariff design, on the one hand, the RIC considered that maintaining the current consumption thresholds (the blocks and their existing limits) and adjusting the corresponding prices would elicit an adequate conservation response. On the other hand, for customers enjoying a significant amount of discretionary consumption, maintaining the current tiered structure, even with price adjustments, may not have elicited the response required. Hence, to further incentivise conservation and send a price signal that better reflected the higher long-run cost that would be incurred to procure additional electricity capacity, the RIC believed that it was necessary to introduce an additional block to the existing IBT structure.

The RIC initially proposed[63] that:

- the first two blocks of the existing structure be maintained. The 225,000 customers that currently consume electricity within the lifeline and those within the 401–1000 kWh block comprise 52% of the residential customer base but consume only 20 percent of the total electricity used by domestic customers.
- the last block could be split into two, to distinguish different consumption levels of larger users, and encourage more efficient use of electricity by these customers through pricing. Further, the additional block/tier in the tariff structure at the higher end of the consumption spectrum should discourage wastage of electricity and conserve natural gas resources as this remains the primary fuel for electricity generation in Trinidad and Tobago.[64]

Based on a monthly billing cycle, the RIC's initial four-block IBT structure for residential customers is shown in Table 12.6 below. Residential customer consumption data for 2020 was used to reallocate the 48% of customers that currently consume more than 500 kWh monthly or 1000 kWh bi-monthly into two tiers.

Table 12.6: IBT Tiers for Monthly Residential Consumption Initially Proposed[65]

	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**	
kWh Range	**0-200**	**201-500**	**501-1200**	**>1200**	**TOTAL**
% Total Customers	18.6%	33.8%	34.9%	12.7%	**100%**
% of kWh	2.9%	17.5%	41.4%	32.2%	**100%**

Calculated by the RIC

[63] See the RIC's **"Principles of Rate Design and Tariff Structures" (March 2022).**
[64] The price for natural gas to be paid by T&TEC is a policy matter for the Government and has historically been subsidised.
[65] The customer and kWh data are relevant to the bimonthly period November 1– December 31, 2020.

In the Draft Determination, the RIC widened the second and third tiers. This widening provided an opportunity for consumers whose real incomes may have fallen, to maintain their electricity consumption with moderate increases in their bill. The new proposed structure for residential customers, in which these customers will be billed monthly, now consists of:

- a customer (fixed) charge;
- a variable component for the first 200 kWh consumed (Tier 1);
- a variable component for the next 500 kWh consumed (Tier 2);
- a variable component for the next 700 kWh (Tier 3); and
- a variable component for consumption thereafter (Tier 4).

The fixed component is consistent with the fixed costs of providing electricity. The variable components are likely to provide efficient price signals, promote efficient demand management, and promote better economic use of resources.

Table 12.7: Revised IBT Tiers for Monthly Residential Consumption[66]

	Tier 1	**Tier 2**	**Tier 3**	**Tier 4**	
kWh Range	**0-200**	**201-700**	**701-1400**	**>1400**	**TOTAL**
% Total Customers	18.6%	48.5%	22.9%	10.0%	**100%**
% of kWh	2.9%	30.7%	33.6%	32.8%	**100%**

Stakeholder Comments and Final Decision

One respondent proposed the creation of a fifth tier and was of the view if this could not be done, that these households should fall into the industrial sector as their consumption outweighs the lowest consumption for the industrial sector.

The RIC had discussed this issue of the creation of multiple tiers in its Principles of Rate Design and Tariff Structures consultative document, and had noted that the degree to which increasing block rates discourages consumption depends on the distribution of customer usage across tiers of consumption and the magnitude of the price changes across the tiers as well as the billing

[66] Data relevant to the period November 1– December 31, 2020.

frequency. The RIC has already introduced a fourth tier in the inclining block and has switched to monthly billing. The RIC is cognisant that as a regulator it needs to balance the incentive to conserve electricity against the potential loss of revenue to the service provider (a fifth tier can be viewed as punitive) and is of the view that an appropriate balance has been struck.

The RIC agrees that after new rates are implemented, closer monitoring needs to be done by T&TEC on those residential customers whose consumption is excessively high, and appropriate investigations conducted to determine whether they need to be reclassified.

The RIC's decision is that the tiers for residential customers will be as shown in Table 12.7.

The RIC will continuously focus its attention on aligning the rates for all categories of consumers with the cost of supply and will be examining other options for addressing affordability and broader hardship issues more effectively in the future. This may involve examining how T&TEC's policies and practices currently deal with customers who are generally unable to pay their bill, especially vulnerable and disadvantaged groups. It will also include requirements for T&TEC to assist customers who have payment difficulties, through the provision of flexible payment plans where appropriate.

The smallest increase has been proposed for lower income groups. With respect to low-income groups, the RIC's two main initiatives for reducing the impact of increased prices are:

(a) **Discount/Tariff Mechanism:** A lifeline tariff which allows households to pay a lower rate for electricity usage up to a specified (monthly) consumption level.

(b) **Service Provider Support Programme:** T&TEC must be proactive and assist customers before their financial obligation to the Commission reaches a crisis stage by:

- offering preventative measures such as payment plans, in accordance with the Codes of Practice; and
- advising them about Government-sponsored support.

As discussed previously, T&TEC will also be mandated to implement an Energy Efficiency Programme to ensure consumers take steps to reduce and/or manage energy consumption, thereby mitigating the impact of rising electricity costs. Education is an important component of an efficiency programme to help customers make wise electricity usage choices which can lead to lower bills.

Other measures to assist low-income groups that are available to the service provider include:

- waiving of interest payments on outstanding accounts;
- protection from service termination; and
- extended payment arrangements by providing the option of arranging alternative payment schedules and paying bills in smaller installments (this is to be agreed between the customer and service provider).

There are also Government-sponsored Assistance Programmes:

- Customers registered with the Ministry of Public Utilities can receive assistance for the payment of the electricity bills under the Utility Assistance Programme (UAP). Assistance is also provided for electrical repairs.
- Government also currently provides a 35% rebate to T&TEC residential customers on bills that are $300.00 or lower (inclusive of value added tax).

Stakeholder Comments

The RIC received a number of comments/concerns related to the UAP and the Bill Assistance /Rebate programme. These included:

- **how the rebates would be applied given the move towards monthly billing,**
- **the lack of accessibility to the UAP by some vulnerable groups,**
- **the lack of public education related to the requirements to access the UAP.**

Both the UAP and the rebate programme are administered by Government, through the Ministry of Public Utilities (MPU), and the RIC is not responsible for either of these. The UAP is a means-tested programme (applicants must meet certain criteria unrelated to consumption) while the Rebate Programme is not. The RIC has published its views on subsidy programmes, noting that regulatory bodies generally prefer targeted subsidies (see the RIC's document **'Addressing the Affordability of Regulatory Prices' – 2021**). In this context, the RIC would be providing further direct comments to the Ministry of Public Utilities on how to make this programme more cost efficient.

The RIC has also communicated the concerns raised by respondents to the MPU, which has indicated that with respect to the UAP, it will make an effort to reduce the timeframe for the approval process. Notwithstanding, the Government has also indicated that it is developing a "utility card" programme to assist in mitigating the impact of rate increases for low-income and vulnerable customers. The Government has also indicated that the Bill Assistance/Rebate programme will continue and will reflect changes in the billing cycle.

12.8.2 High Density Load or High Load Factor Customers

T&TEC proposed a new customer rate class for High Density or High Load Factor industrial customers. These customers operate high-density technological businesses such as, server farms and data or cryptocurrency mining facilities. The RIC supports this addition of a new rate class "C" with a uniquely predefined energy and demand charge given the markedly different characteristics to other industrial customers. T&TEC will enter into a supply contract with these customers and generally, the supply will be via Overhead Lines/Underground Cables at 12,000, 33,000 or 66,000 volts ± 6%, 3 phase, 4 wire, 60 Hertz. For the purpose of capital contribution, the RIC's 2022 Policy will apply, and this class will be treated as industrial customers.

The RIC's decision is that matters related to High Density or High Load Factor industrial customers will be as detailed in Section 12.8.2.

12.8.3 Commercial (Rate B1 and B2)

In PRE1, the RIC had agreed to divide the commercial class into Rate B and B1. For PRE2, T&TEC has proposed that the categories be reclassified as B1 and B2, respectively. Hence, existing B customers will be reclassified as B1 and existing B1 as B2 customers.

The RIC Decision is that the commercial rate B and B1 customers will be reclassified as B1 and B2, respectively.

12.8.4 Billing Frequency for Residential and Commercial B (now B1) customers, E-billing and minimum bills

The RIC had extensively discussed the merits of moving to monthly billing for all customers in its paper **"Principles of Rate Design and Tariff Structures"**. T&TEC is also in favour of the move to monthly billing. Hence, in the Draft Determination the RIC had proposed that all customers will be billed monthly under the new tariff structures. However, the RIC had not been in favour of a two-tiered customer charge to encourage e-billing nor had the RIC specified minimum bills for all categories of customers.

Stakeholder Comments and Final Decision

There were mixed views with respect to the movement to monthly billing.

The RIC had discussed the frequency of the billing cycle in its paper "**Principles of Rate Design and Tariff Structures**". Therein the main arguments for monthly billing, included:

- from a customer standpoint, monthly billing can ease the burden on low-income consumers, on the basis that they would be able to better align their monthly expenditure on utilities with their monthly (weekly or fortnightly) earnings. More frequent billing also allows consumers to make quicker adjustments to their consumption; and
- it improved the cash flow position of the utility;

The RIC believes that there are distinct advantages to monthly billing and is in favour of monthly billing.

T&TEC also noted that the RIC had not agreed to its proposal for a two-tiered customer charge to encourage customers to move to e-billing.

At this time, the majority of T&TEC's customer base still operate on paper-based billing. The RIC's initial thinking was that customers should be encouraged to move to e-billing rather than through differential charges as proposed by T&TEC. The RIC has reconsidered its position and requires that T&TEC, at the time of the first Annual Tariff Adjustment, submit an appropriate cost-based proposal for a differential customer charge for those customers who choose to receive a paper bill. Until such time as differential charges are effected, T&TEC must increase its efforts to encourage customers to move to e-billing.

T&TEC also noted that the RIC had only specified a minimum bill for B2 (formerly B1) customers but had not specified a minimum bill for other customers and requested that the RIC specify the minimum bill for all customers including industrial and High Density customers.

For PRE1 the RIC had allowed T&TEC to establish minimum bills for all rate classes except for B2 (formerly B1) customers. In their Business Plan, T&TEC did not propose new minimum bills, nor did they express a desire for the RIC to establish these charges. However, the RIC has no objection to placing minimum bills under close regulatory scrutiny. The RIC notes that typically a minimum bill is designed to recover a minimum level of revenue, recognising that some costs are still incurred to maintain service even if a customer does not use energy or uses very little. T&TEC must, therefore, provide a proposal within two (2) months of the publication of the Final Determination for minimum bills for each rate category, which must be cost justified. In the interim, the current minimum bills will continue to apply.

The RIC's decision is that all T&TEC's customers are to be billed monthly, effective from the publication of the Final Determination. However, T&TEC will determine the specific dates for implementation and advise customers accordingly. The RIC, in order to encourage customers to migrate to e-billing requires that T&TEC, at the time of the first Annual Tariff Adjustment, submit a cost-based proposal for a differential customer charge for those customers who choose to receive a paper bill. T&TEC must also provide a proposal, within two (2) months of the publication of the Final Determination, for minimum bills for each rate category, which must be cost justified. In the interim, the current minimum bills will continue to apply.

12.8.5 Cross-subsidies and proposed tariffs

In the Draft Determination the RIC noted that had there been regular price reviews following the expiry of PRE1 the resultant price increases would have been sufficient to offset any cost incurred by T&TEC to provide services.

In the circumstances, the RIC sought to balance the initial impact of full cost recovery on residential customers by allowing some cross-subsidies to them by industrial customers. Further, the RIC noted that ideally, these cross-subsidies should be unwound in the shortest possible time and the RIC intended to "phase-in" tariffs so that residential customers would pay cost-reflective prices by the end of PRE2.

Stakeholder Comments and Final Decision

The RIC's proposed tariffs for 2023 elicited the most responses from commenters and those views are outlined below:

- **Residential customers held the view that any increase to their rates would be unfair and undeserved, given the current economic climate.**
- **Commercial and industrial customers, though often understanding the need for tariff adjustments requested that consideration be given to "phasing in" of the adjustments or sought "special rates".**
- **At least one respondent felt strongly that there should be no cross subsidies from industrial to residential customers.**

The RIC has given due consideration to the concerns raised, and as discussed in Chapter 11 has adjusted its smoothed revenue requirements to bring relief. With respect to the tariffs, certain reductions were made to the industrial and commercial rates, however, no adjustments were made to the residential tariffs. The new rates for residential customers meet the criteria established for affordability. Further, this class will benefit from the provision of cross-subsidies by industrial customers, which will be unwound in due course. With respect to cross subsidies the RIC understands the concern however, in the absence of an alternate source of subsidy this remains the only option.

RIC's decision is that the tariff structure and charges for 2023 will be as detailed in Table 12.8.

Table 12.8: RIC's Proposed Tariffs for 2023

Rate Class		Energy Charge ($/kWh)	Customer Charge ($)	Demand Charge ($/KVA)
Residential (Monthly) kWh Range			7.50	NA
1	200	0.2800		
201	700	0.4000		
701	1400	0.5400		
>1400		0.6800		
Commercial (Monthly)				NA
B1		0.5600	35.00	
B2		0.6700	35.00	
Industrial (Monthly)				
C1		0.6269	50.00	93.00
C2		0.5858	50.00	93.00
C3		0.5487	50.00	93.00
C4		0.5114	50.00	93.00
D1		0.3145	50.00	79.00
D2		0.3508	50.00	80.45
D3		0.3126	50.00	72.00
D4		0.2723	50.00	65.20
D5		0.2608	50.00	60.31
E1		0.3306	100.00	97.01
E2		0.3306	100.00	95.04
E3		0.3306	100.00	93.74
E4		0.3306	100.00	92.40
E5		0.3306	100.00	91.43
Public Lighting (Monthly)				
Street Lights		82.50		
Traffic Lights		71.50		
Recreation Grounds		306.50		

*** B1 (formerly B) customers**
****Minimum Bill of 5000kWh applies to B2 (formerly B1) customers.**
N/A – not applicable

12.9 IMPACT OF RIC'S PROPOSED PRICING DECISION

In this section, the RIC considers the impact of its pricing decision on customers, especially the low income and disadvantaged groups, household expenditure and welfare, the country's competitiveness and the service provider. In essence, the RIC sought to balance the need for T&TEC to recover its efficient costs with the goal of achieving fair and acceptable outcomes for all stakeholders. Therefore, in assessing the impact of tariffs, the RIC focused both on potential impacts on users and on T&TEC's forecast level of cost recovery. Consequently, the RIC has been conscious of the need to select an optimal pace for tariff adjustments, to avoid excessive revenue risk exposure to T&TEC, and rate shock to the consumer. The efficiency improvement factor imposed on T&TEC in the form of mandating savings through the adoption of efficiency improvement requirements was aimed at transformation in the desired direction. A provision for sharing gains from productivity improvements in excess of the X-factor requirement between consumers and T&TEC has also been outlined.

The RIC's analysis concentrated on the overall effect on customers' total bills. It examined how the increased prices would impact bills and the energy consumption of customers.

Impact on Customers

The impact on individual customers will depend on a number of factors, of which the proposed price path adjustment is just one. Affordability outcomes would be particularly influenced by changes to the tariff structure such as the low usage (lifeline) charge, as changes in these have the potential to impact individual bills significantly.

In general, relative increases in the customer (fixed) charge will create a greater percentage change in bills for small consumers, compared to relative increases in the volumetric charge.
As can be seen from table 12.9, a typical **residential** customer using 400 kWh would currently pay $110.00 bi-monthly. After the new consumption bands and corresponding rates are implemented, this customer (assuming a consumption level of 200 kWh monthly) will now pay $127.00 over two (2) months. However, as discussed above, all customers will be on a monthly billing cycle, therefore, this customer's actual monthly bill for 200 kWh consumption will be

$63.50. It is useful to note that customers using up to 400 kWh bi-monthly currently comprise about 20% (or 90,685 customers) of T&TEC's total residential customer base. Residential customers whose average consumption is 627 kWh per month, for instance, will receive a bill of $234.30 per month or 18% increase when compared on a two-month basis. Since the residential tariff structure is an inclining block, it should be noted that the percentage increases in monthly bills can vary for customers whose consumption fall within the higher tiers. For instance, consumers who are currently using 3,000 kWh bi-monthly will experience a 36% increase over a two-month period.

For customers reliant on government pensions, or falling into similar low-income groups, whose monthly expenditure is about $3,000.00 and consume about 200 kWh monthly, their total monthly expenditure on electricity of $63.50 will be about 2.1% of their monthly income, well below the internationally accepted benchmark of about 10%.

Table 12.9: Impact of Price Increases on Bills of Typical Residential Customers, 2023

Bi-monthly Consumption (kWh)	Current Total Bill Bi-Monthly	New Rates Total Bill Bi-Monthly	Change		Monthly Consumption (kWh)	New Rates Monthly Bill
			Bi-Monthly	Bi-Monthly		
	TT $	TT $	TT $	%		TT $
200	58.00	71.00	13.00	22%	100	35.50
400	110.00	127.00	17.00	15%	200	63.50
600	174.00	207.00	33.00	19%	300	103.50
800	238.00	287.00	49.00	21%	400	143.50
1500	487.00	581.00	94.00	19%	750	290.50
3000	1,042.00	1,419.00	377.00	36%	1,500	709.50
7000	2,522.00	4,139.00	1,617.00	64%	3,500	2,069.50

NB: Bi-monthly information for new rates is presented for comparative purposes only. All customers will now be on a **monthly** billing cycle.
Calculated by the RIC

The impact of the RIC's decisions on commercial and industrial customers will generally vary depending on their level of usage. Commercial and industrial customers are much more diverse in terms of their usage patterns than residential customers, therefore, it is difficult to draw general conclusions about the impact of this decision on these customers. Notwithstanding, a **commercial** B1 (formerly B) customer (Table 12.10) using 500 kWh bi-monthly currently pays $232.50. After the new rates are implemented, this customer will effectively pay $350.00 over two months, but will actually incur a monthly bill of $175.00 for 250 kWh of electricity consumed per month.

Table 12.10: Impact of Price Increases on Bills of Typical B1 Commercial Customers, 2023

Consumption (kWh)	Current	New Rates	Change			
	Bi-Monthly	Bi-Monthly	Bi-Monthly		Monthly Consumption	New Rates Monthly
	TT$	TT$	TT$	%	kWh	TT$
500	232.50	350.00	117.50	51%	250	175.00
800	357.00	518.00	161.00	45%	400	259.00
1200	523.00	742.00	219.00	42%	600	371.00
1500	647.50	910.00	262.50	41%	750	455.00
2500	1,062.50	1,470.00	407.50	38%	1,250	735.00
5000	2,100.00	2,870.00	770.00	37%	2,500	1,435.00

NB: Bi-monthly information for new rates is presented for comparative purposes only. All customers will now be on a **monthly** billing cycle.
Calculated by the RIC

The impact on typical bills of B2 (formerly B1) customers will be in the range of 10-11% monthly, as seen in Table 12.11 below.

Table 12.11: Impact of Price Increases on Bills of Typical B2 Commercial Customers, 2023

Consumption (kWh)	Current Monthly TT$	New Rates Monthly TT$	Change Monthly TT$	Change Monthly %
5000	3,050	3,385	335	11%
7000	4,270	4,725	455	11%
9000	5,490	6,065	575	10%
11000	6,710	7,405	695	10%

***B2 (formerly B1) customers pay a minimum bill of 5000 kWh.**

Calculated by the RIC

As discussed above, a new class was created for high-density/high load factor customers, industrial C class. Sample bills for this newly introduced class of (industrial) customers are shown in Table 12.12 below while the impact on industrial D and E classes are shown in Table 12.13 below.

Table 12.12: Sample Bills of Industrial (C) Customers, 2023

Class	Sample kWh and kVA	Current Monthly Bill TT$	New Rates Monthly Bill TT$	Change Monthly TT$	Change Monthly %
C1	150,000 kWh, 200 kVA	N/A	**112,735**	N/A	**--**
C2	5,000,000 kWh, 7,000 kVA	N/A	**3,580,100**	N/A	**--**
C3	10,000,000 kWh, 15,000 kVA	N/A	**6,882,100**	N/A	**--**
C4	25,000,000 kWh, 35,000 kVA	N/A	**16,040,100**	N/A	**--**

Calculated by the RIC

Table 12.13: Impact of Price Increases on Bills of Typical Industrial Customers, 2023

Industrial (D) - Sample Bill Impacts					
Class	Sample kWh and kVA	Current	New Rates	Change	
		Monthly Bill	Monthly Bill	Monthly	
		TT$	TT$	TT$	%
D1	20,000 kWh, 90 kVA	8,480	13,450	4,920	58.0%
D2	1,000,000 kWh, 2,500 kVA	343,000	551,975	208,975	61.0%
D3	2,000,000 kWh, 10,000 kVA	791,000	1,345,250	554,250	70.0%
D4	4,000,000 kWh, 10,000 kVA	1,068,000	1,741,250	673,250	63.0%
D5	30,000 kWh, 14,000 kVA	522,800	852,214	329,414	63.0%
E1	2,000,000 kWh, 39,000 kVA	2,025,500	4,444,690	2,419,190	120%
E2	10,000,000 kWh, 110,000 kVA	6,290,000	13,760,500	7,470,500	119%
E3	60,079,900 kWh, 75,775 kVA	11,969,911	26,965,663	14,995,753	125%
E4	80,079,900 kWh, 102,774 kVA	15,928,094	35,970,833	20,042,739	126%
E5	101,347,472 kWh, 226,368 kVA	23,976,471	54,202,400	30,225,929	126%

Calculated by the RIC

Impact on Household Expenditure and Welfare

Stakeholder Comments and Final Decision

During the consultation several respondents expressed concern about using dated information from the CSO.

The RIC understands the concern, and while the CSO figure was a valid proxy, as total household expenditure should typically increase overtime, the RIC has made adjustments. Hence, in the absence of information from a more recent Household Budgetary Survey, a reasonable proxy for current household expenditure would be to adjust the 2008/2009 average monthly expenditure by the annual rate of inflation.[67] This yields a monthly average household expenditure of $11,424 and expenditure on electricity (using the average monthly consumption) represents 2.04% of this amount. In Trinidad and Tobago, it may also be useful to consider household expenditure for low-income customers as the equivalent of the senior citizen monthly pension grant of $3,500. At this level of expenditure, the average household electricity bill after the rate increase ($234.00) represents 6.7% of expenditure, which is within the international guidelines. Therefore, the RIC is satisfied that the impact of its pricing decision on residential customers is reasonable.

Impact on Country Competitiveness

Based on the proposed increases for commercial and industrial customers, the actual increase in electricity bills will depend on the specific customer's actual consumption level and their assigned customer class. On average, Commercial (B1) customers will see an increase in their bills in the range of 37%–51%, while the increases for Industrial D customers will range from 58%–70%, and Industrial E customers will see increases from 119–126%.

The RIC considered the likely impact of increased electricity charges on different productive sectors of the economy and, consequently, on the competitiveness of these sectors. The CSO provided data on electricity as a percentage of operating costs for various productive sectors, which was available up to 2015. Table 12.14 shows that for 2015, on average, electricity constituted 1.5% of the total production costs of commercial/industrial entities in Trinidad and Tobago. The RIC notes that for some sectors/firms this percentage may be higher, however, it is also true that for other sectors/firms, electricity as a percentage of total operating costs would be lower than the average. In this regard, despite the proposed increases in rates, and on the assumption that electricity costs have been averaged to represent 1.5% of total costs across industries, the expectation is that the increased costs of electricity would not have a major impact on total operating expenses of different industries. Also, it is likely that total operating

[67] See "The Impact of Declining Central Government Transfers and Subsidies on the Household Sector: Implications for Financial Stability", Yannick Melville and Nikkita Persad, WP03/2022 October 2022, published by the Central Bank of Trinidad and Tobago.

expenses of productive sectors have increased since 2015, therefore, the percentage increases in electricity would translate to a lower percentage impact, on their total operating expenses.

Table 12.14: Contribution of Electricity to Total Operating Expenses of Industries, 2015

Industry/Sector	**Electricity as a percentage (%) of Total Operating Cost (2015)**
Agriculture, forestry and fishing	3.0
Mining and quarrying	0.5
Food, Beverages and Tobacco Products	1.0
Textiles, wood, paper and printing	1.1
Petroleum and Chemical Products	0.8
Other manufactured products	1.7
Water supply and sewerage	5.6
Construction	1.9
Trade and repairs	1.0
Transport and storage	0.5
Accommodation and food services	2.6
Information and communication	1.9
Financial and insurance activities	0.3
Professional, scientific and technical services	1.8
Administrative and support services	0.5
Public administration	1.1
Education	0.8
Human health and social work	0.9
Arts, entertainment and recreation	1.3
Other service activities	1.3
Domestic services	1.2

Source: Central Statistical Office (2022)

The RIC also compared a total bill of a typical industrial customer in Trinidad and Tobago with customers in some of the other Caribbean countries (Table 12.15). As seen from the Table 12.15 below, a typical industrial customer in Trinidad and Tobago currently has a lower total bill compared to other Caribbean countries, except for Suriname. This situation will remain largely the same after the implementation of new rates.

Table 12.15: Typical Industrial Customer Bills in various Caribbean Countries, 2021

Country	Total Monthly bill (US $)
Barbados	31,165
Belize	18,300
British Virgin Islands	29,891
Curacao	34,719
Dominica	45,637
Grand Cayman	33,483
Grenada	31,111
Guyana	23,483
Jamaica	35,804
Suriname	5,000
Trinidad and Tobago (2021)	4,980
Trinidad and Tobago (new rate from 2023)	**7,610**

Source: CARILEC

Calculations for Trinidad and Tobago done by RIC

Financial Impact on T&TEC

Table 12.16 and Figures 12.1 and 12.2 below demonstrate that starting tariffs will result in a positive operating profit[68] and operating cashflow during the regulatory control period. The total revenue for the first year of the control period is projected to be $4,893.83 million using starting tariff for PRE2. After deducting all expenses inclusive of depreciation, operating profit is projected to be $83.62 million, as shown in Figure 12.1. T&TEC's operating profits are expected to remain robust for the next two years. However, including the Debt to NGC in 2026 is expected to negatively affect T&TEC such that they are likely to incur a loss. It should be noted that these projected values may change as annual tariffs reviews could result in tariff changes for each year, as well as the actual kWh outturn may differ from projections.

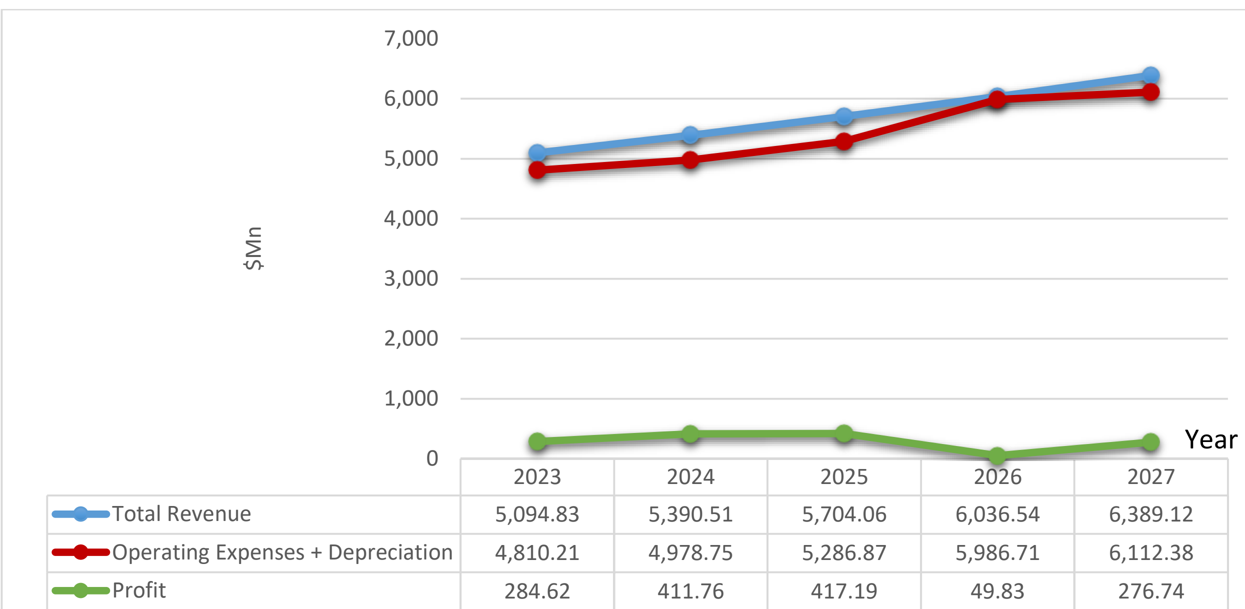
[68] This is an operating profit. The price limits include a provision for financing capital expenditure.

Table 12.16: Profit and Loss Account with New Tariffs ($Million)

	2023	2024	2025	2026	2027
Operating Revenue	4,893.83	5,189.51	5,503.06	5,835.54	6,188.12
Expenditure:					
Operating Expenditure	1,013.73	1,051.54	1,046.33	1,030.73	1,007.80
Conversion Cost	1,764.99	1,788.45	1,936.61	1,957.72	1,983.90
Fuel Cost	1,752.22	1,859.74	2,023.37	2,139.51	2,261.13
Net Surplus (Deficit) before Interest & Depreciation	362.89	489.78	496.75	707.58	935.29
Depreciation	279.27	279.02	280.55	280.03	280.83
N.G.C. Debt	-	-	-	578.71	578.71
Net Surplus (Deficit) after Interest & Depreciation*	83.62	210.76	216.20	(151.16)	75.75

*Excluding other income.
Calculated by the RIC

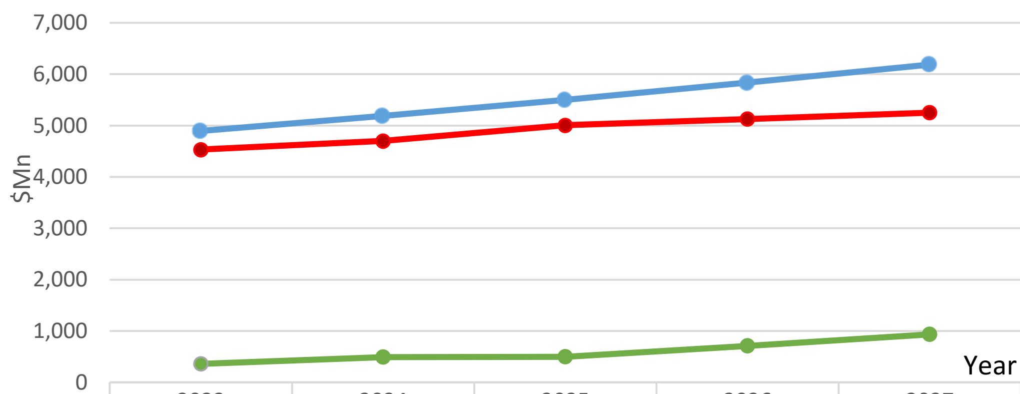
Figure 12.1: T&TEC's Profits under New Tariffs (Including Other Income)



Source: RIC

All cashflow (or Funds from Operations) parameters also show improvements under the proposed tariffs. Operating cashflow in 2023 is projected to be $362.89 million, eventually increasing to $935.29 million by 2027. The RIC believes that T&TEC's financial position will continue to remain sufficiently strong to maintain appropriate levels of financeability in the foreseeable future.

Figure 12.2: T&TEC's Operating Cashflows under New Tariffs



	2023	2024	2025	2026	2027
Operating Revenue	4,893.83	5,189.51	5,503.06	5,835.54	6,188.12
Operating Expenses	4,530.94	4,699.73	5,006.31	5,127.96	5,252.83
FFO	362.89	489.78	496.75	707.58	935.29

Calculated by the RIC

12.10 PRICE DETERMINATION

The following is the RIC's **Final Determination** in respect of electricity transmission and distribution services for the five-year period 2023 to 2027.

1. Period of Determination

The provisions below will apply for the five-year period from 2023 to 2027.

2. Pricing of Services to be Regulated

Revenue Cap for Transmission and Distribution Services:

- For the first year of the regulatory control period 2023–2027, the RIC has proposed a tariff structure and the maximum rates that can be for each customer class charged by T&TEC for each customer class, these are indicated in Table 12.17.

Table 12.17: Tariffs for 2023

Rate Class		Energy Charge ($/kWh)	Customer Charge ($)	Demand Charge ($/KVA)
Residential (Monthly) kWh Range			7.50	NA
1	200	0.2800		
201	700	0.4000		
701	1400	0.5400		
>1400		0.6800		
Commercial (Monthly)				NA
B1		0.5600	35.00	
B2		0.6700	35.00	
Industrial (Monthly)				
C1		0.6269	50.00	93.00
C2		0.5858	50.00	93.00
C3		0.5487	50.00	93.00
C4		0.5114	50.00	93.00
D1		0.3145	50.00	79.00
D2		0.3508	50.00	80.45
D3		0.3126	50.00	72.00
D4		0.2723	50.00	65.20
D5		0.2608	50.00	60.31
E1		0.3306	100.00	97.01
E2		0.3306	100.00	95.04
E3		0.3306	100.00	93.74
E4		0.3306	100.00	92.40
E5		0.3306	100.00	91.43
Public Lighting (Monthly)				
Street Lights		82.50		
Traffic Lights		71.50		
Recreation Grounds		306.50		

*** B1 (formerly B) customers**
**** Minimum monthly bill of 5000kWh for B2 (formerly B1) customers**
N/A. Not applicable
Calculated by the RIC

- Maximum tariffs for year *t* such that the reasonable forecast annual revenue requirement (ARR_t) received from the service complies with the following formula in Box 12.1 below:

Box 12.1: Formula for Establishing Annual Revenue Requirement

$$ARR_t \leq [(1 + RPI)(1 - X_t)] \times ARR_{t-1} + U$$

Where:

Year $_t$	X_t
2024	1.3%
2025	1.3%
2026	1.3%
2027	1.3%

ARR = Annual Revenue Requirement received from Services.

ARR_{t-1} = Annual Revenue Requirement received from Services in the previous year, and ARR_{2023} is $4893.83 million.

RPI = the Retail Price Index which has been fixed for the purpose of the RIC's calculation at 4.7% per year.

X = The efficiency factor

U = Unused charge. T&TEC will be permitted to carry over any unused change in charges from one year to the following years.

The overall side constraint is set at (RPI + X) = 6.0%.

3. Side Constraint

The overall side constraint is set at (RPI + X) = 6.0%.

4. Regulated Miscellaneous Services and Charges from 2023

The following services will be regulated by the RIC and the prices for these services are set out in Table 12.18:

Table 12.18: Regulated Miscellaneous Services and Charges from 2023

	Charge ($)
• Meter Check at customer's request: - If found in working order - If found defective	 246.00 No charge
• Visit for Non-payment of account	297.00
• Install meter and reconnect secondaries	246.00
• Reconnect, disconnect and/or change meter	246.00
• Reposition of secondaries	246.00
• Change and/or reposition meter	246.00
• Disconnection for non-payment	150.00
• Reconnection after disconnection for non-payment	150.00
• HV isolation during normal working hours	4,689.36
• HV isolation during weekends and public holidays	16,300.44
• Direct single phase temporary supply	3,024.70
• Direct three phase temporary supply	5,718.41
• Temporary Supply (URD) "Stick in meter"	2,131.44
• Transformer Rentals	408.00 - 2400.00*

*There is a range of monthly charges for transformer rentals, depending on size of the transformer.

The charges for the regulated services may be reviewed at the mid-point of the second control period, based on the approved charging principles and after consultation with the RIC.

5. Annual Price Approval Process during the Control Period

- At least three months prior to the beginning of each year of the regulatory control period, T&TEC must submit proposed tariffs to apply from the start of each year of the regulatory control period.
- T&TEC must ensure that its proposed tariffs comply with the established principles.
- T&TEC must, if requested by the RIC, provide additional information and resubmit or revise its proposed tariffs.
- The RIC must inform T&TEC in writing whether or not it has verified T&TEC's proposed tariffs as compliant with the relevant established principles.
- The proposed tariffs will be deemed to have been verified as compliant by the end of the three months from the date of receipt of T&TEC's Annual Tariff Approval Submission.
- T&TEC must inform customers of the new tariffs at least twenty-one days before implementation through publication in at least one daily newspaper in circulation in Trinidad and Tobago.
- T&TEC is prohibited from introducing new tariffs and/or tariff components during the regulatory control period other than those approved by the RIC.

6. Trigger Event

The trigger event will only apply if a situation imposes a total annualised cost of more than 1% of allowed revenue.

7. Tariff Implementation

T&TEC must ensure that any future decision to not charge a maximum determined price is appropriately authorised by the Board of T&TEC and written reasons are provided to the RIC.

13 CONCLUDING REMARKS AND WAY FORWARD

This Price Review for the regulatory control period 2023 to 2027 is the second review completed by the RIC for the Electricity Transmission and Distribution Sector. PRE1 expired in 2011, and the prices that were approved under that price control continued to be in effect since that time. The long lag period between both reviews meant that T&TEC was unable to service some of its debts and finance its overall operations satisfactorily. In order to fulfil its obligations under its Act and in recognition of the challenges faced by T&TEC, the RIC initiated a Price Review in December 2020 by requesting that T&TEC submit its Business Plan.

The RIC Act provides guidance on the regulatory framework to be adopted in conducting price reviews for the utility sector. The process should be smooth and seamless, with reviews conducted at regular five-year intervals or over shorter periods. For regulation to be effective, there must be consistency and certainty. A regulator must ensure that a utility receives adequate funding to provide a high quality of services, and to protect the interest of customers. Given the extremely long lag between reviews, the submission of T&TEC's Business Plan should have been given high priority. However, the Plan was received almost one year after it was requested, and that introduced further delays. A way must be found to remove the bottlenecks that inhibit the RIC in the conduct of its functions.

Under incentive regulation a primary goal is to ensure that prices are cost reflective. However, it is sometimes challenging to meet the objective of cost reflective tariffs while ensuring affordable prices for customers. The RIC expended considerable time and effort in determining the final prices, especially for persons in the lower income and vulnerable groups, and for small businesses. The prices were approved after careful consideration and analysis of the comments and suggestions received from the general public and special interest groups. We acknowledge all persons and entities that provided comments and suggestions (both oral and written) and we thank them for their efforts. The final prices are evidence that the RIC altered its initial position after careful consideration to the views expressed.

The RIC understands that a State-owned and operated utility faces constraints that its private-sector counterpart does not. Therefore, T&TEC must take note that the decisions within the Final Determination must be incorporated within its operational and financial plans and ensure that they are implemented. The RIC's pricing decisions must be viewed as a comprehensive package of service quality improvements for customers premised on the approved price limits and not simply as an adjustment to tariffs. Consequently, the RIC intends to pay close attention to T&TEC's implementation of its allowed Capex programme, and its efforts towards cost containment during PRE 2.

The RIC expects T&TEC to comply with the following:

- T&TEC must promote openness and facilitate public knowledge about, and participation in, its core activities by: making information and documentation available on its website; making the website more interactive and user friendly, including contact details for key personnel (e.g. e-mail, telephone); and including a prominent section on its website to highlight its planning and development activities (on-going and completed), which must be periodically updated (annually).
- T&TEC must produce quarterly revenue and expenditure statements in accordance with the regulatory accounting guidelines established by the RIC and where appropriate, make these statements widely accessible on its website, and to the media.
- T&TEC must provide information on its website about the number of complaints and their effectiveness in dealing with those complaints.
- T&TEC must demonstrate, in the future, that it consulted with its customers prior to the submission of its Business Plan and that due regard has been given to the views that customers expressed during the consultation process.
- T&TEC must provide information on its website about its procurement process to allow customers access to its procurement processes that are underway, completed, or pending approval, including information such as requirements for submitting bids, important dates, and the amounts bid by tenderers.

- T&TEC must collect more systematic data on public viewpoints through its customer service centres to better understand the experience of those who have had cause to complain and to ascertain how their concerns were addressed.
- T&TEC must publish its performance against all customer service targets, on its website[69], and produce a half-yearly overview report for the public with commentary on where and why this performance has not met the targets. Reports on these findings should be submitted to the RIC annually.
- T&TEC must disclose information about how many complaints it receives and resolves annually, and publish data on its performance with respect to quality of service and its operations.
- T&TEC must utilise independent researchers, approved by the RIC, to undertake more generalised surveys regarding customers' experience with utility services, either before the end of the regulatory control period or at least every five years. The results of this survey must be included in its Business Plan submission for the next regulatory control period.

It should be noted that a well maintained and efficiently managed transmission and distribution utility is essential to the success of the national economy. However, the utility must receive adequate funding to enable it to maintain and renew its infrastructure. In the absence of adequate funding, services are likely to deteriorate and adversely impact the entire economy.

It should be of concern to all citizens that the consumption of energy produced from fossil fuels contributes to environmental degradation. In that regard, we urge customers to practice conservation and energy efficiency. The rates set by the RIC have been designed to support those objectives, but individual education and human effort are required to ensure success. Finally, the RIC is confident that T&TEC will embrace the opportunity to improve its performance in all areas and rise to the challenges that have been set for it in PRE2, thereby ensuring that customers obtain value for money from the service provider.

[69] These reports can also be shared on social media.

APPENDIX
Examination of T&TEC's Labour Efficiency – Crew Sizes

Over the period 2012 to 2020, T&TEC's staff has decreased from 3,137 to 2,903 (7.5%). T&TEC's labour productivity over the same period has improved, as demonstrated by an increase in its customer-per-employee ratio from 158 in 2011 to 176 in 2021. T&TEC's ratio of employee per thousand customers is relatively high when compared to other electric utilities, as seen in Table A1 below. For instance, the Jamaican electricity utility (JPS), with a much larger customer base than T&TEC, has a significantly lower ratio of employees per thousand customers. When compared to the Saudi Electricity Company, which operates in a similarly industrialised nation as Trinidad and Tobago, with large industrial customers, T&TEC's employee per thousand customers is high.

Table A1: Customer per employee for selected countries

Utility	Country	Staff Numbers	Customer Numbers	Customers per employee	Employees per thousand customers
T&TEC	Trinidad and Tobago	2,888	508,892	176	5.7
LUCELEC	St Lucia	276	70,744	256	3.9
JPS	Jamaica	1,300	683,887	526	1.9
DOMLEC	Dominica	210	35,702	170	5.9
Caribbean Utilities Co.	Cayman Islands	239	32,000	133	7.5
Florida Light and Power	USA	9,100	5,700,000	626	1.6
The Hawaiian Electric Companies	USA	2,504	470,612	187	5.3
Scottish and Southern Energy	UK	12,489	3,800,000	304	3.3
Saudi Electricity Company	Saudi Arabia	33,437	10,122,895	303	3.3

Compiled by the RIC

In addition to specialised equipment, significant labour resources are required for the operation and maintenance of a reliable transmission and distribution (T&D) network. The deployment of suitable staff for maintenance and overhead line works impacts on the overall productivity of the utility. One of the factors that directly impacts labour productivity is scheduling the right size crew for the job with appropriate equipment. In general, the conventional thinking is that smaller crew sizes are more productive; however, analysis suggests that utilities change their crew composition to fit specific jobs. A survey of utility crew productivity practices in the United States undertaken by First Quartile Consulting[70] suggests that even though one-person crews are used for simpler overhead jobs, the most common practice is to send a two-person crew for overhead service (from an existing overhead transformer). The RIC's research has confirmed that the typical crew size for several electric utilities in the United States is two. The crew foreman is responsible for driving the utility's vehicle to the jobsite. This crew size is typical for transformer installation, streetlight repair and trouble-calls. New overhead line construction or new pole installations are often contracted out by many utilities in the United States; therefore, the contractors have control of their crew size. In the case of transmission line work and some line maintenance, multiple two-man crews may be used.

The RIC has examined T&TEC's linesman crew sizes for typical construction and maintenance jobs to assess efficiency in its use of labour for such work, in particular, the typical crew sizes deployed by T&TEC for various types of jobs. [71] As seen in Table A2 below, T&TEC's crew size for overhead line works is notably different in its inclusion of a designated driver compared to other jurisdictions in the region. In the other jurisdictions, the linesmen must have the appropriate heavy-duty drivers permit by the completion of their probation period, which then enables them to drive the service vehicle. This eliminates the need for a designated driver within T&D job crews.

[70] https://www.power-grid.com/customer-service/benchmarking-results-t-d-crew-size-and-equipment-analysis/
[71] The crew sizes used by T&TEC conform to the registered agreements between the majority trade union and T&TEC.

Table A2: Benchmarking of typical crew composition by job type

Utility	Job Type					
	Overhead line and Emergency Crews	Cable Crew	Connection Crew	Corrective Maintenance	Live Line Activity	Standard Crew Size
T&TEC (Trinidad and Tobago)	**Five (5) man crew** including: One (1) crew supervisor Three (3) linesmen **One (1) driver**	**Five (5) man crew including:** One (1) supervisor Three (1) jointers **One (1) driver**	**Five (5) man crew including:** One (1) supervisor Three (3) linesmen (two in the case of disconnection **One (1) driver**			
JPSCO (Jamaica)	**Two (2) man crew (No designated driver)**			**Eight (8) man crew (No designated driver)**	**Five (5) man crew (No designated driver)**	
DOMLEC (Domnica)						**Five (5) man crew (No designated driver)**
BL&P (Barbados)						**Two (2) person crew (No designated driver)**

Compiled by the RIC

The RIC understands that both the availability of equipment and suitable staff is crucial to the operation and maintenance of a reliable transmission and distribution (T&D) network, and has allowed revenue for T&TEC to expand its fleet of specialised vehicles that are utilised for the construction and maintenance of T&D lines. In addition, the RIC has made financial provisions to support T&TEC's thrust towards automation of various components along their T&D network, including improvement in their SCADA management system. Through the revenue requirement, the RIC will continue its support for T&TEC's investment in equipment that will improve their response time to trouble reports and overall efficiency of operations. The RIC's view is that T&TEC can improve its productivity by re-examining the size and composition of its linesman crews, inclusive of the elimination of the position of a designated driver.

ANNEXURES

ANNEX 1

LIST OF STAKEHOLDERS WHO SUBMITTED WRITTEN RESPONSES TO THE DRAFT DETERMINATION

	Name of Person/Organisation
1	Adam Raffoul
2	Andre Acres
3	Bianca Banfield
4	Clifford Radhay
5	Curtis Boodoo
6	Confederation of Regional Business Chambers
7	Dinesh Rambally
8	Energy Chamber of Trinidad and Tobago
9	Edwin Caines
10	Fahd Rahman
11	Fishermen and Friends of the Sea
12	Franklyn Maraj
13	Jack Warner
14	Jerry Ramdass
15	Judy Bedayse
16	Marisa Ragoonath
17	Movement for Social Justice
18	National Trade Union Centre of Trinidad and Tobago
19	Poultry Association of Trinidad & Tobago
20	Ramesh Lutchmedial
21	Robert Amar
22	Trinidad and Tobago Electricity Commission
23	Trinidad and Tobago Civil Advocacy Network
24	Trinidad and Tobago Manufacturers Association
25	Valmikki Arjoon & Kiel Taklalsingh
26	Yasim Edoo

LIST OF STAKEHOLDERS WHO ATTENDED THE RIC'S PUBLIC CONSULTATIONS ON THE DRAFT DETERMINATION[72]

DATE/VENUE	NAME OF STAKEHOLDERS
Thursday, January 12, 2023 TTARP Office	**Special Interest Groups** - Trinidad and Tobago Association for Retired Persons (TTARP)
	1. Reynold Cooper 2. Michelle Nunes 3. Kern Williams 4. Mayling Younglao

DATE/VENUE	NAME OF STAKEHOLDERS	
Tuesday, January 17, 2023 Centre of Excellence, Macoya	**Special Interest Groups** - Greater Tunapuna Chamber of Commerce - San Juan Business Association 1. Abrahim Ali	
	Public Consultation	
	1. Denzil Ali* 2. Nadia Ali 3. Sonia Alkhal 4. Robert Amar* 5. M.P. Khadijah Ameen* 6. Brian Baig* 7. Richard Baker 8. Roland Baksh 9. Narendra Balgobin 10. Shanika Baljit 11. Alderman Dianne Bishop 12. Annabelle Brasnell 13. M. Bridgewater 14. Phylis Bruce 15. Nigel Charles 16. Suresh Cholai 17. Vanessa Choonie 18. Zarion Choonie	19. Harold Cousins 20. Jermaine Cruickshank 21. Lyndon De Gannes* 22. Anne De Silva 23. Leisha Dhoray 24. Richardson Diaz 25. Sean Douglas 26. Alicia Evelyn 27. Rhondall Feeles 28. Kay Marie Fletcher 29. Sheryllan Fraser 30. Neil Fraser* 31. Flora Geoffroy 32. Councillor Racquel Ghany 33. Jackie Gittens 34. Councillor Balmati Gosyne 35. Anthony Gulston* 36. Edison Hoolasie 37. Louann Hospedales

[72] * Represent persons who stated their names and made comments at the respective meetings.

DATE/VENUE	NAME OF STAKEHOLDERS	
Tuesday, January 17, 2023 Centre of Excellence, Macoya	**Public Consultation – Continued**	
	38. Kazim Ishmael 39. Sunadai Jagroo 40. Kaysho Jaikaran 41. Chanroutie Jattan 42. Neville John 43. Curtis John 44. Boodram John 45. Stanley Jones* 46. Rishard Khan 47. K. Khan 48. Chanty Lalsingh 49. Shawn Lamy 50. Monica Lewis* 51. Nadira Maharaj 52. Kenneth Maring 53. Wendell Mayers 54. Dr. Kirk Meighoo 55. Ray Mohammed 56. Shakir Mohammed 57. Alderman Nazeemool Mohammed 58. Joanne Mora 59. Dharia Nelson-Seales 60. Immanuel Nunez 61. Taharqa Obika 62. M.P. Barry Padarath* 63. D. Phillips* 64. Pamela Pillai 65. J. Price	66. Adam Raffoul* 67. Farida Ragoonanan 68. Rawantee Ramlal 69. Jaggernauth Ramoutar 70. Tricia Ramoutar 71. Councillor Ryan Rampersad 72. Councillor Richard Rampersad 73. Gillian Ramsaran 74. Councillor Seema Ramsaran-Augustine 75. C. Ramsewak 76. Albert Reyes 77. Senator Anil Roberts* 78. James A. Robinson 79. Councillor J-Lynn Roopnarine 80. Theo Sammy 81. Liza Samuel 82. Rose-Marie Seebrath 83. Joanne Seebrath-Hoyte 84. Indramaltie Seenath 85. Meena Seeraj 86. Cindy B. Singh 87. Marilyn Smith 88. Henreatta Smith 89. Dr. Vidhya Gyan Tota-Maharaj 90. Marsha Walker* 91. Jack Warner* 92. Anthony Wilson

- There were approximately 1,700 online views during the Tunapuna public consultations.

DATE/VENUE	NAME OF STAKEHOLDERS
Thursday, January 19, 2023 Arima Community Center	**Special Interest Groups** – Arima Business Association
	1. Israel Armstrong 2. Avind Ramcharan 3. Christian Rampersad

DATE/VENUE	NAME OF STAKEHOLDERS	
Thursday, January 19, 2023 Arima Community Center	**Public Consultation**	
	1. Fuad Abu Bakr* 2. Dianne Alexander 3. Imran Ali* 4. Aleema Ali 5. Sonia Alkhal 6. Eugene Allemany 7. M.P. Khadijah Ameen 8. Radica Arjoon 9. M. Assee 10. Phillip Atiba 11. Roger B.* 12. Brian Baig* 13. David Bally 14. Stern Barnes 15. Alderman Dianne Bishop 16. Mariela Bruzual 17. Jerome Chaitan 18. Nigel Charles 19. Kerwin Charles 20. Lenroy Cornwall 21. Dianne Diaz 22. Ryan Diaz 23. Richardson Diaz 24. Lincoln Douglas 25. Kay Fletcher 26. Ayinde Frederick 27. Lyndon Gannes 28. Flora Geoffroy 29. Racquel Ghany 30. Elizabeth Gonzales 31. Azim Gulab 32. Roxanne Harris Dalrymple* 33. Frank Hopin 34. Roger Jacob 35. Krysta James 36. Neville John 37. Bertram Jordan 38. Haydn Joseph* 39. Zahir Khan 40. Curlene Lambie	41. Sophia Leps 42. Monica Lewis* 43. Councillor John Lezama 44. Ann Lui 45. Daniel Mackoondal 46. Vedya Mahabir 47. Balliram Maharaj* 48. Dr. Kirk Meighoo 49. Kerwin Meloney 50. Anthon Meloney 51. Ashel Murray 52. Priya Nagassar 53. Senator David Nakhid 54. Immanuel Nunez 55. Curtis O'Brady* 56. M.P. Barry Padarath* 57. Clint Pamphile 58. Councillor Brennon Patterson 59. Claudia Paul 60. Ann Pollard 61. Sonia Ragoopath 62. Councillor Linette Ramcharan 63. Sudesh Ramkissoon* 64. Roodal Ramlal 65. Fazeem Rampersad 66. Seema Ramsaran-Augustine 67. Devron Richards 68. Jairzinho Rigsby* 69. Senator Anil Roberts* 70. Councillor J-Lynn Roopnarine 71. Liza Samuel 72. Rodger Samuel* 73. Henreatte Smith 74. Ryan Spicer* 75. Clyde Stephan 76. Wayne Thompson 77. Marsha Walker* 78. H. Wilson 79. Councillor Joycelyn Worrell

- There were approximately 1600 online views during the Arima public consultations.

DATE/VENUE	NAME OF STAKEHOLDERS	
Monday, January 23, 2023 Canaan, Tobago	**Public Consultation**	
	1. Peter Alberto 2. Laurison P. Baird 3. Andre Baker 4. Anthony Baynes* 5. Dolly Charles* 6. Nigel Charles 7. Anson Clarke* 8. Corey Connelly 9. Rhondall Feeles* 10. Daud George 11. Uriana George-Nathaniel 12. Sean Giles 13. Vindra Gopaul 14. Che Gordon* 15. Gillianne Gray 16. Pete Gray* 17. Noreen Guy 18. Marilyn Hackett 19. Curtis Harry	20. Darren Joseph* 21. Lyndon Mark* 22. Colin Martin* 23. Wendell Mayers 24. Vera Melville 25. Lucille Parcy* 26. Marjorie Phillips 27. Kimmi Potts 28. Safiya Potts-Makou 29. Arista Quaccoo 30. Denesha Roberts 31. Anson Robley 32. Marsha Sandy Fraser 33. Tracy Shields* 34. Earla Shields 35. Reginald Vidale* 36. Emmarie Waldron 37. Liz Williams 38. Kenneth Winchester

DATE/VENUE	NAME OF STAKEHOLDERS
Tuesday, January 24, 2023 Settlements, Public Utilities and Rural Development Crown Point, Tobago	**Special Interest Groups** – Tobago House of Assembly
	1. Kern Alexis 2. Assemblyman Niall George 3. Dalia Jerry 4. Anson McDonald 5. Assemblyman Ian Pollard 6. Jiselle Small 7. Shana Thomas

DATE/VENUE	NAME OF STAKEHOLDERS
Tuesday, January 24, 2023 Milford Road, Scarborough, Tobago	**Special Interest Groups** – Trinidad and Tobago Chamber of Commerce – Tobago Division
	1. Demi-John Cruikshank 2. Diane Hadad 3. James Morshead 4. Curtis Williams

DATE/VENUE	NAME OF STAKEHOLDERS	
Tuesday, January 24, 2023 Belle Gardens, Tobago	**Public Consultation**	
	1. Yvette Andrew 2. Kenrick Andrews 3. Curtis D. Archie 4. Andre Baker 5. Annabelle Brasnell 6. Adina Campbell* 7. Peter Cox* 8. Curvis Francois 9. Pete Gray* 10. Curtis Stephen Harry Sr.* 11. Maurice Hercules* 12. Shelley-Anne James	13. Max James* 14. Geva Job 15. Wendell Mayers 16. Safiya Potts 17. Arista Quaccoo 18. Rondell Richards 19. Eon Robley* 20. Schekeil Rochford 21. Rosemary Sandy* 22. Tarnya Sergeant 23. Leslie St. Hillaire 24. Nickson Trotman

- There were 744 online views during the Tobago public consultations.

DATE/VENUE	NAME OF STAKEHOLDERS	
Monday, February 6, 2023 Hilton Trinidad & Conference Centre	**Special Interest Groups** – Supermarket Association of Trinidad and Tobago	
	1. Wazeer Aleem 2. Shamshad Ali 3. Daniel Austin 4. Dave Baijoo 5. L. Bhooplall 6. Anand Deopersad	7. Rajiv Diptee 8. Heeranand Maharaj 9. Nigel Persad 10. Stephen Sookhan 11. Pamela Vargas Goveia

DATE/VENUE	NAME OF STAKEHOLDERS
Monday, February 6, 2023 Hilton Trinidad & Conference Centre	**Special Interest Groups** – Fishermen & Friends of the Sea
	1. Gary Aboud 2. Lisa Premchand

DATE/VENUE	NAME OF STAKEHOLDERS
Monday, February 6, 2023 Hilton Trinidad & Conference Centre	**Special Interest Groups** – Agricultural Society of Trinidad and Tobago
	1. Harryram Pragg 2. Gregory C. Reece

DATE/VENUE	NAME OF STAKEHOLDERS
Monday, February 6, 2023 Hilton Trinidad & Conference Centre	**Special Interest Groups** – Poultry Association of Trinidad & Tobago
	1. Kalam Ali 2. Ronnie Mohammed 3. Robin Phillips 4. Jerry Ramdass

<table>
<tr><th>DATE/VENUE</th><th colspan="2">NAME OF STAKEHOLDERS</th></tr>
<tr><td rowspan="2">Tuesday, February 7, 2023
Paria Suites Hotel & Conference Centre</td><td colspan="2">Special Interest Groups
– Greater San Fernando Chamber of Industry and Commerce
– Confederation of Regional Business Associations
– Penal/Debe Chamber of Commerce
– Rio Claro Chamber of Commerce
– Fyzabad Chamber of Commerce</td></tr>
<tr><td>1. Shareeza Ali
2. Kalawatie Borielal
3. Vivek Charran
4. Anthony Da Costa
5. Sunil Ganase
6. Samuel George
7. Winston George
8. Jai Leladharsingh</td><td>9. Ricardo Mohammed
10. Deo Ramdass
11. Shirley Ramdeen
12. Arun Ramdeen
13. Sandra Ramjit
14. Rampersad Sieuraj
15. Kiran Singh</td></tr>
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<tr><th>DATE/VENUE</th><th colspan="2">NAME OF STAKEHOLDERS</th></tr>
<tr><td rowspan="2">Wednesday, February 8, 2023
Hilton Trinidad & Conference Centre</td><td colspan="2">Special Interest Groups
– Trinidad and Tobago Manufacturers’ Association</td></tr>
<tr><td>1. Ryan Besai
2. Troy Burns
3. Tricia Coosal
4. Ryan Hamilton Davis
5. Josue de la Maza
6. Kristen De Montbrun
7. Jorge Hoyos
8. Sheldon Jerome
9. Craig La Croix
10. Nigel Lucky-Samaroo
11. I. Manrique
12. Manzue Mohammed</td><td>13. Jason Mohammed
14. Dale Parson
15. Roland Phillips
16. Rajesh Rajkumarsingh
17. Ramesh Ramdeen
18. Emil Ramkissoon
19. Marlon Rattan
20. Roger Roach
21. Sheldon Thomas
22. Richard Thompson
23. Clint Villafana</td></tr>
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<tr><th>DATE/VENUE</th><th colspan="2">NAME OF STAKEHOLDERS</th></tr>
<tr><td rowspan="2">Friday, February 10, 2023
Hilton Trinidad & Conference Centre</td><td colspan="2">Special Interest Groups
– Oilfield Workers Trade Union
– Communication workers Union
– Other Unions (attended but did not stay for the entire session)</td></tr>
<tr><td>1. Michael Annisette
2. Peter Burke
3. Ann Chan Chow
4. Ashton Cunningham
5. Clyde Elder
6. Colin Gumbs</td><td>7. Reesa Jodha
8. Alvard Mitchell
9. Khadijah Mohammed
10. Joseph Remy
11. Clifton Simpson
12. Steve Theodore</td></tr>
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<tr><th>DATE/VENUE</th><th colspan="2">NAME OF STAKEHOLDERS</th></tr>
<tr><td rowspan="2">Monday, February 13, 2023
Couva</td><td colspan="2">Special Interest Groups
– Couva/Point Lisas Chamber of Commerce</td></tr>
<tr><td>1. Rasheed Allaham
2. Mala Cardinal
3. Lois Carmino
4. Amit Dass
5. Derek Joseph
6. Tishara Khan
7. Kean Kirton
8. Steve Kuadaroo
9. Tara Lakhan
10. Alisha Mohamed Stephen
11. Shaheed Mohammed
12. Diann Ragoonanan</td><td>13. Marisa Ragoonath
14. Colin Ramesar
15. Serala Ramlogan
16. Mukesh Ramsingh
17. Amanda Ramsingh
18. Kerryn Roopnarine
19. Arneal Sieupresad
20. Loise Silva
21. Joselle G. Sirju
22. Patrick Smith
23. Ryan Stephens
24. Sharon Thomas</td></tr>
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<tr><th>DATE/VENUE</th><th colspan="2">NAME OF STAKEHOLDERS</th></tr>
<tr><td rowspan="2">Monday, February 13, 2023
Couva</td><td colspan="2">Special Interest Groups
– Energy Chamber of Trinidad and Tobago</td></tr>
<tr><td>1. Gordon Bute
2. Shivanand Chanderbally
3. Vishard Chandool
4. Jerome Dookie
5. Thackwray Driver</td><td>6. Andrew Hosein
7. David Maharaj
8. Lara Quentrall-Thomas
9. Dale Ramlakhan
10. Geevan Sankersingh</td></tr>
</table>

DATE/VENUE	NAME OF STAKEHOLDERS
Monday, February 20, 2023 (PM) Hilton Trinidad & Conference Centre	**Special Interest Groups** – Trinidad and Tobago Chamber of Industry and Commerce
	1. Jason Berkeley 2. Stephen De Gannes 3. Jackie Gittens 4. Sultan Hosein 5. D’Angelo Merritt

DATE/VENUE	NAME OF STAKEHOLDERS
Monday, February 20, 2023 Hilton Trinidad & Conference Centre - (ONLINE)	**Special Interest Groups**
	1. Pritam Agard 2. Hayden Charles 3. Amjad H. 4. Mukesh Mahangro 5. Spkendra

DATE/VENUE	NAME OF STAKEHOLDERS
Friday, February 24, 2023 (ONLINE)	**Special Interest Groups** – Trinidad and Tobago Publishers and Broadcasters Association (TTPBA)
	1. Jason Corbie 2. Douglas Wilson

DATE/VENUE	NAME OF STAKEHOLDERS	
Tuesday, March 7, 2023 Auditorium, Government Campus Plaza, Port of Spain	**Public Consultation**	
	1. Andre Acres	9. Wendell Mayers
	2. Sonia Alkhal	10. Curt J. Mohammed
	3. Rebekah Archer	11. Kishan Roopan
	4. Annabelle Brasnell	12. Riane Rosales
	5. Germaine Cruickshank	13. Janelle Souza
	6. Zsaria Diaz	14. Marsha Walker
	7. Kay Fletcher	15. Eli Zakour
	8. Stanley Jones	

- There were 248 online views during the Port of Spain (East) public consultations.

DATE/VENUE	NAME OF STAKEHOLDERS	
Saturday, March 11, 2023 **(10:00 am)** Mayaro Civic Center	**Public Consultation**	
	1. Oliver Alexander*	24. Bartholomew Lynch*
	2. Mintra R. Baksh	25. Dulcie Mahabir
	3. Annabelle Brasnell	26. Wendell Mayers
	4. Margaret Burris	27. Councillor Shaffik Mohammed
	5. Nicole Cameron	28. Asha Devi Mohan*
	6. Grant Cameron*	29. Sherry Mohan
	7. Nigel Charles	30. Councillor Charleen Moona
	8. Alderman Raymond Cozier	31. Joshelle Oudai
	9. Priscilla Daniel	32. Whitney Pacheco*
	10. Althea De Fretas	33. M.P. Rushton Paray*
	11. Alderman Toolsie Deokailie	34. Councillor Wendell Perez*
	12. Solangé Delpino	35. Karina Persad
	13. Ria Figaro	36. Cindy Persad
	14. Deomatie Gangaram	37. Susan Pierre
	15. Vcanney Honora*	38. Councillor Hazarie Ramdeen
	16. Kathleen Jones	39. Nandanee R. Ramdhanie
	17. Shaquilla Jones	40. Steve Rampersad
	18. Tahira Joseph	41. Lilawatie Sankar
	19. Catherine Joseph	42. Sabrina Sookdeo
	20. Tamika Joseph	43. Krishna Sookoo*
	21. Brenda Joseph	44. Antonia Suzano
	22. Councillor Renelle Kissoon	
	23. Councillor David Law*	

- There were 1,600 online views during the Mayaro public consultations.

<table>
<tr><th>DATE/VENUE</th><th colspan="2">NAME OF STAKEHOLDERS</th></tr>
<tr><td rowspan="2">Saturday, March 11, 2023 (3:00 pm)
Sangre Grande Civic Center</td><td colspan="2">Public Consultation</td></tr>
<tr><td>1. Brian Baig*
2. Vishma Balliram
3. Sacha Budhu
4. Nigel Charles
5. Vincent H.
6. Alderman Suzan Holder*
7. Councillor Nassar Hosein*
8. Haile A.B. N James
9. Anthony Joseph*
10. Sabrina Khillawan
11. Wendell Mayers
12. Councillor Paul Mongolas*
13. M.P. Barry Padarath*</td><td>14. Devika Persad-Suraj
15. Councillor Kenwyn Phillip*
16. Wendell Phillip
17. Debra Prescott Spencer*
18. Adelia Prince
19. Shalini Ragoobir Mohammed
20. Glen Ram
21. Mary Ramdath
22. Kareena Ramdath
23. Councillor Calvin Seecharan*
24. Lystra Sutton
25. Joseph Toney*</td></tr>
</table>

- There were 501 online views during the Sangre Grande public consultations.

DATE/VENUE	NAME OF STAKEHOLDERS	
Wednesday, March 15, 2023 (5:00 pm) Centrum Auditorium, Center Pointe Mall, Chaguanas	**Public Consultation**	
	1. Sandra Abdool 2. Vivica Aguillera 3. Narinedaye Ajodha 4. Faiz Ali 5. Ronald Ali 6. Susan Ali 7. Sheerize Ali 8. Nazma S. Ali 9. Nafarah Ali 10. Raffiena Ali Boodoosingh 11. Sheriffa Naseem Ali-Ballantine 12. Sonia Alkhal 13. Solomon Antoine 14. Councillor Henry Awong 15. Darrin B. 16. Carla Babwah 17. Parbatie Babwah 18. Sharen Badal Ahyew 19. Siewdath Bahal 20. Brian Baig 21. Edme Baird 22. Sheldon Balgobin 23. Dularie Balgobin 24. Councillor Anil Baliram 25. Priya Barran 26. Kristal Beharry-Shadick 27. Judy Benjamin 28. Shirley Birbal 29. Councillor Debbie Boodhan 30. Kim Boodram 31. Kurt Bowlah 32. Avinash Carl 33. Rangit Chaitlal 34. Doolarchan Chattergoon* 35. Geeta Chickooree 36. Jasmine Cordes 37. Colin Cuffy 38. Natasha Dalchan 39. Omatee Dass 40. Kenny Deonarine	41. Ralph Deonarine 42. Chris Deonarine 43. Carla Dhanraj 44. Parmati Dhiram 45. Vinod Dipchand 46. Andre Dookie 47. Lauren Ehoura 48. Hilary Elliott 49. Councillor Wendy Francis 50. Daniel Gandelal 51. Michael Gobin 52. Councillor Gangaram Gopaul 53. Sharda Gopaulchan 54. Sahadeo Gosine* 55. Councillor Balmati Gosyne 56. Rudy Gowrie 57. Ophilea Grazette 58. Michael Guelmo 59. Kyle Guyton 60. Rudolph Hanamji 61. Parvatie Harripersad 62. Rishi Harrynanan 63. Lutchman Harrypersad 64. M.P. Anita Haynes 65. M. Hosein 66. M.P. Saddam Hosein 67. Gloria Huggins 68. Mary Isaac 69. M.P. Rudranath Indarsingh 70. Dhanwantie J. 71. Sandra Jadoonanan 72. Indra K. Jagessar 73. Samuel Jaglal 74. Jasodra Jagroop 75. Yoegita Jaikaran 76. Lakpati Jaikaran 77. Sangeeta Jaimungal 78. Rhoda Jattan 79. Terence Jokhu 80. Sundar Jookoo 81. Rahendra Jookoo

<table>
<tr><th>DATE/VENUE</th><th colspan="2">NAME OF STAKEHOLDERS</th></tr>
<tr><td rowspan="2">Wednesday, March 15, 2023 (5:00 pm)
Centrum Auditorium, Center Pointe Mall, Chaguanas</td><td colspan="2">Public Consultation – Continued</td></tr>
<tr><td>82. Sharda Khan
83. Darlene Khan
84. Councillor Shazeeda Khan-Mohammed
85. Ken Lakhan
86. Franka Lawrence
87. Lester Leu
88. Councillor John Lezama
89. Karen Lopez
90. Ramesh Lutchmedial
91. Waheeda M.
92. Marie Madoo
93. Taradath Manack
94. Alderman P. Mangaroo
95. Nicholas Manohar
96. Jaganath Manohar
97. Karuna Maraj
98. Anisha Maraj
99. Alderman Venosh Maraj
100. Wendell Mayers
101. Dr. Kirk Meighoo
102. Councillor Faaiq Mohammed
103. Wazim Mohammed
104. Shaheed Mohammed*
105. Ashley Mohammed
106. Councillor Vishan Mohammed
107. Rahaz Mohammed
108. Sheheza Mohammed
109. Vashti Mohammed
110. Majeed Mohammed
111. Kavita Moonasar
112. Wendell N.
113. Priya Nagassar
114. Orlando Nagessar
115. Kim Nanan
116. Councillor Dubraj Persad
117. Kamla Phagoo
118. Maria Pierre
119. Diane Pilgrim
120. Geeta Pittiman</td><td>121. Renuka Pramsook
122. Deokie Pramsook
123. Ramdeo R.
124. Indra Ragbir
125. Indarjit Ragoonanan
126. Guyadath Ragoonanan
127. Ritu Rahim
128. Parmesh Rajkumar
129. M.P. Arnold Ram
130. M.P. Dinesh Rambally
131. Angela Rambhajan
132. Nandaram Ramdass
133. Nizam Ramdath
134. Mahadai Ramdeen
135. Ralph Ramdeo
136. Councillor Arelene Ramesar
137. Anjanie Ramjattan
138. Ramkalawan Ramkalawan
139. Chelsea Ramkumar
140. Mohan Ramlogan
141. Nigel Ramnanan
142. Vashaala Ramnanan
143. Ken Ramnarine
144. Gopichan Ramnath
145. Sherryl Ann Ramparsingh
146. Fazeera M. Rampersad
147. Jasodra Rampersad
148. Angela Rampersad
149. Videsh Rampersad
150. Anara Rampersad
151. Hemrajh Rampersad*
152. Dinesh Rampersad
153. Savita Ramphal
154. Premchan Ramsaroop
155. J. R. Ramsaroop
156. Emmanuel Ramsaroop
157. Rianne Ramtahal
158. Daniel Rasheed
159. Amanda Reason
160. Chackon Richard
161. Nirmala Roodal</td></tr>
</table>

DATE/VENUE	NAME OF STAKEHOLDERS	
Wednesday, March 15, 2023 (5:00 pm) Centrum Auditorium, Center Pointe Mall, Chaguanas	**Public Consultation - Continued**	
	162. Kishan Roopan 163. Anand Roopchand 164. Radhica R. Roopchand 165. Kimal Roopnarine 166. Asha Sadal 167. Radha Salick 168. Gowrie Salick Selochan 169. Phyllis Sammy 170. Dhanraj Saroop 171. Radica Seecharan 172. Shane Seelal 173. Councillor Allan Seepersad 174. Ved Seereeram 175. Danice Sheppard 176. Rishi Singh 177. Rajkumar Singh 178. Krishna Sirju	179. Kirdell Sookdeo 180. Marve St. Louis 181. Councillor Whitney Stevenson-Hamlet 182. Councillor Richard Sukdeo 183. Ramrajie Sumairsingh 184. Shirley Supersad 185. Shane Superville 186. Kiel Taklalsingh* 187. Keith Tambie 188. Sheriff Thomas 189. Velda Thurton 190. Marsha Walker 191. Giselle Williams 192. Sumariya Wilson 193. Percine Yeates 194. Tricia Yeates

- There were 393 online views during the Chaguanas public consultations.

DATE/VENUE	NAME OF STAKEHOLDERS	
Saturday, March 18, 2023 (10:00 am) Point Fortin Town Hall	**Public Consultation**	
	1. Umar Abdullah* 2. Sonia Alkhal 3. Brent Clarke 4. Clarke* 5. Innis Francis 6. Radhaka Gualbance* 7. Rajesh Hardyal 8. Edward Marcelle* 9. Nyahuma Obika*	10. Kishan Roopan 11. Sunil Sookram 12. Kester Swan* 13. Councillor Shankar Teelucksingh* 14. Garnett Thompson 15. Nigel Whyte* 16. Anthony Williams*

- There were 447 online views during the Point Fortin public consultations.

DATE/VENUE	NAME OF STAKEHOLDERS
Saturday, March 18, 2023 (3:00 pm) San Fernando North Community Centre	**Public Consultation** 1. David Abdulah* 2. Victor Albert 3. Damian Alexander 4. Mary Allum 5. Jordon Ashoon 6. Keisha Balkaran 7. Anthony Baptiste 8. Angela Billy 9. Councillor K. Chulan 10. Wayne Cyrus 11. Lawrence Deonarine 12. Dexter Dytho 13. Rhondall Feeles* 14. Winston Francois 15. M. Gajadhar 16. Raheem Ghany 17. Tara Goliath 18. Vijay Gopie 19. Veronica Guillan 20. Kern Hankey 21. Abigail Harrilal 22. Nirmala L. Harrilal 23. Foster Harrington 24. Maria Jagnanan 25. Selena Kanhai 26. Councillor Nicholas Kanhai* 27. Kamini Kanhai 28. Clint Katwaroo 29. Azard Khan 30. R. Khan 31. Sharmine Khan 32. Ramsakhie Laing 33. Shamila Lalla-Barran 34. M.P. David Lee* 35. Cecil Lincoln Nurse 36. Senator Jayanti Lutchmedial* 37. Kevin Mahabir 38. Dana Manickchand 39. Rani Maraj 40. Brian Mohammed 41. Shazan Mohammed 42. Shaliza Mohammed 43. S. Mootoo* 44. Ashanie Nandlal 45. Andrew Nannan 46. Vashtie Nannan 47. M.P. Barry Padarath* 48. Patrick Padmore 49. Patrick Patterson 50. Councillor Krishna Persadsingh* 51. Naresh Ragoonanan* 52. Leela Ramdeo 53. Dirk Ramdial 54. Nicholas Rampersad 55. Randy Ramrattan 56. Sylveina Ramroop 57. Sindey Ramsawak 58. Raven Ramsawak 59. Monifa Russell Andrews* 60. Satyam Samaroo 61. Shanti Samlal 62. Alderman Allen Sammy* 63. Reshma Sammy Jankie 64. Alderman Denish Sankersingh 65. Ryan Seepersad 66. Roshan Seeramsingh 67. Pearl Seeramsingh 68. Richard Sibaran 69. Rooplal Sieu 70. Devica Sookhai 71. Hema Sookraj 72. Rookmin Sookram 73. Steve T. 74. M.P. Davendranath Tancoo* 75. Hedy Tenia 76. Nigel Traverso 77. Neville Warner 78. Ozzi Warwick* 79. Trevor Watson 80. Yvonne Webb 81. Kathy Ann Wills 82. Winston Wilson

- There were 662 online views during the San Fernando public consultations.

DATE/VENUE	NAME OF STAKEHOLDERS	
Wednesday, March 22, 2023 (5:00 pm) Diego Martin Community Centre	**Public Consultation**	
	1. Nisa Ackbarali 2. Andre Acres* 3. Nicole Alexander 4. Sonia Alkhal 5. Gillian Arneaud 6. Terrence Butcher* 7. Greta Frank 8. Marissa Gomez 9. Suzanne Hinds 10. Ayesha Hinkson 11. Camille Hunte 12. Sabrina Khillawan	13. Gail La Touche 14. C. La Touche 15. John Laquis* 16. Senator Damian Lyder* 17. D. Maillard* 18. Alana Mussio 19. Immanuel Nunez 20. Kishan Roopan 21. Ishmael Salandy 22. Marsha Walker* 23. Eli Zakour*

- There were 616 online views during the Diego Martin public consultations.

DATE/VENUE	NAME OF STAKEHOLDERS	
Saturday, March 25, 2023 (10:00 am) JRD Mohammed Convention Centre, St. Croix Road, Princes Town	**Public Consultation**	
	1. Anjalie Ali 2. Steve Ali 3. Sherifa Ali Balgobin 4. Shaheed Allaham* 5. Leia Allen 6. Shamiroon Amarile 7. Valini Baboolal-Ragbirsingh 8. Hameraj Balmacoon 9. M.P. Michelle Benjamin* 10. Ramdeo Boochoon* 11. M.P. Rodney Charles* 12. Celine Charlo 13. A. Daniel 14. David Darsan 15. Tricia Deonanan 16. R. Deonarine 17. Katisha Dookoo 18. Kimoy Leon Sing Frederick	19. Debbie George 20. Marvin Hamilton 21. Kamla Harrilal 22. Deborah James 23. N. Karapan 24. Azard Khan 25. Rookmin Khan 26. Councillor Rajesh Lall 27. Councillor Joseph Lorant 28. Garib Maharaj 29. Diawantee Maharaj 30. Doreen Maharaj 31. Karen Maharaj-Peetan 32. Councillor Deryck Mathura* 33. Rookmin Mathura 34. Shazan Mohammed 35. Tataree Mohammed 36. Imran Wayne Mohammed

DATE/VENUE	NAME OF STAKEHOLDERS	
Saturday, March 25, 2023 (10:00 am) JRD Mohammed Convention Centre, St. Croix Road, Princes Town	**Public Consultation - Continued**	
	37. Wazir Mohammed 38. Nadirah Mohammed 39. Karamath Mohammed 40. Shaz Mohammed 41. A. Mohammed* 42. Ayoub Mohammed 43. Councillor Rafi Mohammed 44. S. Mootoo* 45. Peterson Morales* 46. Siew Nandlal 47. Councillor Latchmi Narine Ramdhan* 48. M.P. Barry Padarath* 49. Bachan Pariag 50. Savitri Persad 51. Marlon Peters 52. Anwar Pierre 53. Shawn Premchand 54. Ronnie R. 55. Vincent Raghoo 56. Prakash Ragoonanan 57. Gayatri Ragoonanan 58. Rishi Ragoonath 59. Shyam Rajack 60. A. Ram 61. Indira Ram	62. Maltee Ramdath 63. Oosha Ramdeen 64. Radley Ramdhan 65. Susan Ramkhalawan 66. Cynthia L. Ramkissoon 67. Dhanraj Ramkissoon 68. Sean Ramlochan 69. N. Rampersad 70. Sherril Ravello 71. Kishan Roopan 72. Gourie Roopnarine 73. Scherry Samaroo 74. Dexter Samaroo 75. Sharlene Samuel 76. Asha Seecharan 77. Sandra Seepersad 78. Shivani Seepersad 79. Ronald Simmons 80. Rodney Simmons 81. Rudy Sookhai 82. Alderman Vashti Sookhoo 83. Rajpatee Sooroojdeen 84. T. Watson 85. Dave Williams 86. Laurel V. Williams

- There were 353 online views during the Princes Town public consultations.

DATE/VENUE	NAME OF STAKEHOLDERS	
Saturday, March 25, 2023 (3:00 pm) Thick Village Community Centre, Siparia	**Public Consultation**	
	1. Councillor Jason Ali* 2. Eileen Applewhite Steele 3. Nazim Awadie* 4. Micah Beal 5. Councillor Shanty Boodram 6. Girley Boodram 7. Councillor Deryck Bowrin* 8. Kenneth Bridgelal 9. Amar Bridgelal 10. Shelly Ann Cayenne 11. Adrian Chaddie 12. Jaishama Chadeesingh 13. Daniel Charles 14. Michael Chattargoon 15. Kenneth Dumar* 16. Stephen De Gannes 17. Justus De Gannes* 18. Nirmal Dookhoo* 19. K. Dookie 20. Alderman Christopher Encinas 21. Malcolm Gajadhar. 22. Phyllis Gall* 23. Wesley George 24. Ravi George 25. Vijay Gopie 26. Vashti Harripersad 27. Pearl Jackman 28. Joel Jeffery	29. Dale Kawal 30. Paige Maharaj 31. Councillor D. Mayrhoo* 32. Councillor Javed Mohammed* 33. Daniella Mootoo 34. S. Mootoo 35. Peterson Morales 36. Alderman Christine Neptune 37. Jason Perch 38. Michelle Perch 39. Gene Porther 40. Rishi Ragoonath 41. Lystra Rajnath 42. Kumar Ramdass* 43. Vishal Ramlochan 44. Sylverine Ramroop 45. Sahadeo Ranjit 46. Chairman/Alderman Denish Sankersingh* 47. Roshan Seeramsingh 48. M.P. Davendranath Tancoo* 49. Appolinus Titt 50. Carlisa Titt Kokaram 51. Nessa Titt Toussaint 52. Ivan Toolsie 53. Councillor Ramona Victor* 54. Trevor Watson

- There were 743 online views during the Siparia public consultations.

DATE/VENUE	NAME OF STAKEHOLDERS	
Monday, March 27, 2023 (5:00 pm) Queen's Hall, Port of Spain	**Public Consultation**	
	1. Sonia Alkhal 2. Anabelle Brasnell 3. Jermane Cruickshank 4. Kay-Marie Fletcher 5. Sabrina Khillawan 6. Gregory Lalbeharie* 7. Kurt Lange	8. Heather Mohammed* 9. Wendell Mayers 10. Kishan Roopan 11. Neil Stephens 12. Brian Stone* 13. Aaron Williams

- There were 220 online views during the Port of Spain (West) public consultations

DATE/VENUE	NAME OF STAKEHOLDERS
Tuesday, March 28, 2023 (9:00 am) Government Plaza Auditorium Port of Spain	**Special Interest Groups** – Members of the Network of NGOs for the Advancement of Women
	1. Eileen Blackman 2. Marcia Rollock

DATE/VENUE	NAME OF STAKEHOLDERS
Tuesday, March 28, 2023 (3:00 pm) Maracas Bay Community Centre, Maracas	**Public Consultation**
	1. Kevon James 2. Carl La Guerre 3. Nizam Mohammed 4. Ronda Neaves 5. Kishan Roopan

- There were 204 online views during the Maracas Bay public consultations.

DATE/VENUE	NAME OF STAKEHOLDERS
Friday, March 31, 2023 Tobago	**Special Interest Group** – Tobago Hotel and Tourism Association
	1. Maria Yip-John

ANNEX 2

Details of RIC's Tariff Setting Approach

Element	RIC's Approach
Overall Regime	• Incentive-based regulation of the RPI-X form. • Price control is a revenue cap. • Revenue reviews are carried out every five (5) years and smoothing techniques are used to determine annual revenue from which tariffs are calculated. • Price control includes a correction factor for under and over recovery of revenue on an *ex-post* basis.
Length of the Control Period	• The control period is five (5) years, but the RIC Act allows for an interim review provided it is well-justified. This multi-year determination period facilitates long-term planning, provides greater budget certainty and also reduces the cost of regulation. It provides greater scope to deliver on the efficiency targets built into the determination. It also provides customers with a better indication of how tariffs are likely to move over the five-year period.
Process for Setting Tariffs: • ***Building Blocks Approach***	• The "building-block" approach is used to estimate the revenue that the service provider requires to deliver the proposed/specified standards and outcomes. Demand forecasts play an important role in determining prices needed to raise the required revenue. • Revenue requirement allowance = (Regulatory Asset Base * Regulated Rate of Return) + Regulatory Depreciation + Efficient Operating and Maintenance Expenditure – Capital Contributions. Capital contributions are based on forecast figures with no *ex-post* true-up. Non-tariff revenue is subtracted to get the net annual revenue requirements that need to be generated via tariffs.

Details of RIC's Tariff Setting Approach (Continued)

<table>
<tr><th>Element</th><th>RIC's Approach</th></tr>
<tr><td></td><td>Smoothing technique used to determine the NPV of the revenue stream using an appropriate discount rate (allowed rate of return) and then specifying the smoothed revenue for each year of the price control:
- NPV considers the timing difference between costs and revenue.
- While smoothing implies that revenue will not necessarily match expenditure in any particular year, total revenue recovered is expected to be sufficient to meet total expenditure over the five years of the control period.
Allowances for efficiency improvements, inflation and risks are given due consideration. Uncontrollable costs are largely subject to pass-through arrangements.</td></tr>
<tr><td>Rolling Forward of RAB</td><td>The RAB is rolled forward to account for new Capex, inflationary gain and depreciation.
The movement in the core RPI used to adjust the RAB.</td></tr>
<tr><td>Opex</td><td>The service provider is required to outline in its business plan forecast Opex for each year of the control period, the key drivers of expenditure, justification for forecast expenditure levels and evidence of productivity improvements.
Based on assessing "underlying" operating costs at the time of the price review but using actual audited data for the last completed year before price control is set, against which proposed Opex evaluated.
In assessing the prudence and efficiency of Opex forecasts, several factors are considered:
- the scope for efficiency savings, based on primarily bottom-up analysis of the service provider's business plan and supplemented by international benchmarking.
- adjustments for one-off/exceptional items, expenditure that can be justified as efficient for the future and included in base Opex, factors affecting base Opex (e.g. pensions).</td></tr>
</table>

Details of RIC's Tariff Setting Approach (Continued)

Element	RIC's Approach
	- the potential for efficiency improvements and/or building efficiency targets into the Opex forecasts and upfront reduction of expenditure based on these targets. - trends in forecast Opex from trends in historical Opex, especially over the last five (5) to six (6) years, and whether differences can be readily justified. - whether increases or decreases are consistent with the timing of major capital projects. - whether forecast Opex clearly reflects imposed obligations or improvements demanded by customers.
• ***Capex***	• Service Provider's business plan required to identify: - Capex by different categories, such as, growth-related (required to meet growing demand of new and existing customers), capital maintenance (required to refurbish/replace assets), capital enhancement (required to meet quality standards or improved reliability) etc. - the cost of the programme for each year of the control period; expected starting and delivery dates of the projects and the outcomes that will be delivered from each project. - the discreet projects to be delivered over the regulatory control period. - Government-related and financed projects to be shown separately. These projects are not funded through tariffs. • Proposals to significantly increase Capex to be substantiated by supporting information: - for growth-related Capex, evidence of growth in the numbers of new connections and/or in the demand for the services. - for capital maintenance, evidence that network needs to be renewed to deliver services that meet customers' expectations. - for capital enhancement, evidence of customer demand for enhanced service levels. • In assessing Capex efficiency and prudency, the RIC considers whether:

Details of RIC's Tariff Setting Approach (Continued)

Element	RIC's Approach
	- proposed projects are deliverable over the five-year control period. - the Capex clearly reflects obligations that are required by customers. - the proposed trends in Capex are related to trends in historical expenditure and any difference in the expected level can be identified together with any other relevant factors. - there is evidence of well-developed asset management planning and processes that demonstrate that forecasts have been determined over a long planning horizon. • *Ex-ante* Capex allowance covering expected investment. • No allowance for contingent projects so far. • Failure to deliver required outputs (and/or underspend) results in a reduction of the RAB at the next price review. • Efficient overspend relating to additional outputs and sound investment can both be logged up in the RAB at the next price review.
• ***Depreciation***	• Although other approaches were considered, the straight-line depreciation approach on an inflation indexed asset base is considered to be most appropriate. • Asset lives proposed by the service provider but reviewed by the RIC and, if necessary, compared with international best practice. • Regulatory depreciation is included on assets when they are completed, and the service provider receives a sufficient return on the asset while under construction to ensure that working capital is available to finance the asset. • Regulatory depreciation on new assets taking more than one year to construct is deferred until the project is commissioned.
• ***Return on Assets/Cost of Capital***	• Based on the Regulatory Asset Base and the RIC's assessed likely cost of future borrowing by the service provider, but subject to achieving financial viability in terms of ratios such as interest cover.

Details of RIC's Tariff Setting Approach (Continued)

Element	RIC's Approach
	• Cost of capital is based on a notional level of gearing rather than actual. • Where the service provider has borrowed at rates that are higher than present/future levels, the actual cost of existing debt is included in the revenue requirement allowance as a separate item. • Ability of the service provider to finance its activities is assessed using a set of financial ratios. • So far, no specific additional revenue (upliftment) to address financeability concerns has been allowed.
Dealing with Uncertainty • ***Re-opener (Shipwreck)***	• No formal/automatic clause or mechanism that allows for a determination to be fully re-opened. However, there is a statutory right for the service provider to have an interim review. • The service provider may apply for adjustment during (RIC Act allows this) the regulatory period to take account of events that were uncertain or unforeseen at the time of the price review process. • A threshold of 10% of annual allowed revenue is included for the consideration to take account of deviation in revenue from allowed for any reason (not necessarily from uncertain or unforeseen shock) at the time of making a determination. This is a special consideration that is not the same as a trigger event. • Where indexing is required, the RIC has not used indices other than general inflation (Core Index) as part of the price control decision. • For the Opex allowance, separate "costs items" with specific indicators of input cost trends (e.g. for labour inputs).
• ***Pass-through (Z-factor)***	• No automatic adjustment for unforeseen events (typically treated as "pass-through items" because these events are outside of the firm's control).

Details of RIC's Tariff Setting Approach (Continued)

Element	RIC's Approach
Incentives • ***Overall Incentives***	• A five-year control and the service provider retains any unanticipated benefits for five (5) years but also bears the loss if costs are higher than allowed. • Assessment of efficient Opex and Capex is made *ex-ante* to set the price control allowances. • *Ex-post* efficiency review of both Opex and Capex expenditure. • Use of a notional unders and overs account • A rolling Efficiency carryover mechanism for Opex and Capex, as both treated on an *ex-ante* basis with any unanticipated savings kept for five years from the date of the saving. There is no *ex- post* prudency review for Opex. However, the service provider's ability to meet efficient level of Opex and its service performance over the control period is considered in the next control period. In the case of Capex, methodology for rolling forward the RAB takes into account whether expenditure has been efficiently and prudently incurred. • Provision is made for Capex logging up/down, with the resulting addition or deduction made at the end of the control period. • Capex Information – Quality incentive for honesty in Capex forecasting.
• ***Productivity Improvement***	• The use of the "rate of change" as the generalised efficiency factor to apply to total Opex.
Service Performance	• Public Reporting Scheme (i.e. Performance Monitoring and Reporting) as a basis for measurement of overall average performance, where average/minimum service standards established for different aspects of the service provider's operations. • Guaranteed Standards Scheme, whereby failure to meet guaranteed service levels against a basket of service quality measures involves payments to customers.

Details of RIC's Tariff Setting Approach (Continued)

Element	RIC's Approach
	• No Service Incentive Scheme (S-factor), whereby a direct revenue adjustment is included to reward or penalise the service provider by directly varying the maximum allowed revenue pre-determined for the year. • New proposal to include the use of the Direct Revenue Adjustment mechanism to improve service quality in a key area of concern to customers (i.e. number of customer interruptions). A specified amount of service provider's allowed revenue is to be automatically adjusted for success or failure in meeting these outcomes. • Incentive mechanism for managing system losses.
Customer Involvement in Review Process	• Consultation with all stakeholders is an important part of the rate review process. Extensive consultation process includes releasing for public comment Consultative and Information papers, Draft Determination, conducting public meetings and meetings with business organisations and customer groups. • All consumer protection issues, such as protecting consumers from abuses of monopoly power, standards of quality, reliability and safety of the services, are considered within the price review. • Particular regard paid to the impact of the RIC's decisions on customers (especially on the affordability of services and intergenerational equity). • Service provider encouraged to undertake consultations prior to undertaking any significant activity in the exercise of their core functions and affected by their infrastructure and construction projects. • Customer Service Department of the RIC receives and facilitates the resolution of complaints and identifies systematic issues and refers these to service providers.

Details of RIC's Tariff Setting Approach (Continued)

Element	RIC's Approach
Reporting and Compliance	• The RIC is mandated to prescribe, publish standards of service and monitor compliance and carry out studies of efficiency and economy of operation and of performance and publish results. Public reporting and scrutiny of service provider's performance act as a substitute for competitive pressure, counterbalancing any tendency for the service provider to let its quantity or quality of service decline, and creating effective incentives for it to maintain or improve its service performance. • The RIC has developed a Performance Monitoring and Reporting framework and performance indicators to be reported include financial indicators, customer service, service quality and network characteristics. • The RIC may undertake audits to assess compliance with specific obligations. • Under the established regulatory reporting guidelines, the service provider is required to maintain accounts, and reporting templates are to be populated by the service provider. Information to be supplied include detailed revenue and expenditure information, cash flow, balance sheet, and other related information. These templates are the basis for the formats to be submitted for future regulatory proposals. • Quarterly information is submitted on Guaranteed and Overall standards. • For rate reviews, service providers are required to submit draft and final Business Plans which must contain detailed information on Opex, Capex, revenue, etc. • Frequent reporting on the progress of Capex programme: - Six-monthly reporting on status of projects - Providing detailed data on each project annually. • Service providers are required to make available all information reasonably requested by the RIC from time to time for the purpose of enabling it to confirm that service providers are complying with the Determination.

ANNEX 3

Regulatory Accounting Guidelines

The Tables in this Annex comprise the Regulatory Accounting Guidelines referred to in Chapter 9.7 and are the templates that T&TEC must use in their periodic submission to the RIC.

Balance Sheet BS01

	As at -– xxxx			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
	$'000	$'000	$'000	$'000
FIXED ASSETS				
- Regulated Assets				
- Non-Regulated Assets				
Investment in Subsidiary				
Retirement Benefit Assets				
Total Fixed Assets				
CURRENT ASSETS				
Inventories				
Light and Power Debtors				
Sundry Debtors and Prepayments				
Less: Provision for Bad and Doubtful Debts				
Cash at Bank and in Hand				
Call Deposits				
Other investments				
Due from Subsidiary				
Total Current Assets				
CURRENT LIABILITIES				
Trade Creditors				
Sundry Creditors and Accruals				
Natural Gas (NGC)				
Total Current Liabilities				
TOTAL NET ASSETS				
FINANCED BY				
Capital Funds				
Capital Reserves				
Non-Refundable Capital Contributions				
REVENUE RESERVES				
Accumulated Surplus/Deficit				
Net capital Funds				
Customer' Service Deposits				

	Retirement Benefit Obligations				
EXTERNAL LOANS					
	GoRTT Advances				
	Natural Gas (NGC)				
CAPITAL EMPLOYED					

Fixed Asset Schedule BS02

AS AT - xxxx

	Land $'000	Structures $'000	Transmission Assets $'000	Distribution Assets $'000	Meters $'000	Communications Equipment $'000	Computer Equipment $'000	Motor Vehicles $'000	Street Lighting $'000	TOTAL $'000
Regulatory Asset Base as at										
Additions Based on Approved Projects During the Qtr										
Depreciation for the quarter										
Disposals during the quarter										
Regulatory Assets Base as at										
Non Approved Completed Capital Expenditure during the period										
Funded by:										
Ring Fenced										
Government (PSIP)										

Capital Contributions - Residential										
Capital Contributions - Non Residential										
Regulatory Asset Base at (Unadjusted)										
Adjustments										
Closing Regulatory Asset Base (Adjusted)										

	CAPITAL ADDITIONS $000				**TOTAL $000**	**DISPOSALS $000**
	Tariff Funded	**Capital Contribution**	**Ring Fenced**	**Government**		
TRANSMISSION ASSETS						
Control Gear/ Switchgear			-	-	-	-
Transformers			-	-	-	-
Transmission Lines						
Submarine Cable						
Other						
Subtotal						
DISTRIBUTION ASSETS						
Overhead Lines						
Underground Lines						
Transformers						
Other						
Subtotal						
METERS						
COMMUNICATIONS EQUIPMENT						
COMPUTER EQUIPMENT						

MOTOR VEHICLES						
STRUCTURES						
LAND						
STREET LIGHTING						
GRAND TOTAL						

		NON-LOAD RELATED		NON-NETWORK	
CAPEX CATEGORY $000	**LOAD RELATED (GROWTH)**	**ASSET RENEWAL/ REPLACEMENT**	**RELIABILITY & QUALITY IMPROVEMENT**	**ENVIRONMENTAL, SAFETY & LEGAL OBLIGATIONS**	**OTHER**
Land					
Structures **Transmission (Substations, Overhead lines, Underground cables, Transformers)** **Distribution (Substations, Overhead lines, Underground cables, Transformers)**					
Meters					
Communications Equipment					
Computer Equipment					
Motor Vehicles					
Sub Total (RIC Approved)					
Street Lighting					
Government PSIP					
Ring Fenced					
Sub Total (RIC Non-Approved)					
TOTAL					

Capital Expenditure BS03

RIC Approved Projects $000

Category	Current Qtr RIC Approved	Current Qtr Actual	Transfers	YTD RIC Approved	YTD Actual	Total for year RIC Approved
Transmission- Refurbishments & Replacements						
Transmission & Sub Transmission - Development Projects						
Distribution						
Structures						
Land						
Meters						
Communications Equipment						
Computer Equipment						
Motor Vehicles						
Street Lighting						
Total						

NB - The above information should be categorised as follows:

	Current Qtr RIC Approved	Current Qtr Actual	Transfers	YTD RIC Approved	YTD Actual	Total for year RIC Approved
Load Related (Growth)						
Non-Load Related . Asset Renewal/Replacement						
Reliability & Quality Improvement						
Non-Network . Environmental, Safety & Legal Obligations						
Other						
Total						

NB - Both Tables must agree

Government Policy Driven Projects $000 (PSIP)

Category	Current Qtr			Transfer	YTD			Total for year		
	Budgeted Cost	Received	Spent		Budgeted Cost	Received	Spent	Budgeted Cost	Received	Spent
Transmission- Refurbishments & Replacements										
Transmission & Sub Transmission - Development Projects										
Distribution										
Structures										
Land										
Meters										
Communications Equipment										
Computer Equipment										
Motor Vehicles										
Street Lighting										
Total										

NB - The above information should be categorised as follows:

	Current Qtr			Transfers	YTD			Total for year		
	Budgeted Cost	Received	Spent		Budgeted Cost	Received	Spent	Budgeted Cost	Received	Spent
Load Related (Growth)										
Non-Load Related . Asset Renewal/Replacement										
Reliability & Quality Improvement										
Non-Network . Environmental, Safety & Legal Obligations										
Other										
Total										

NB - Both Tables must agree

Capital Contribution Projects $000

Category	Current Qtr			Transfers	YTD			Total for year		
	Budgeted Cost	**Received**	**Spent**		**Budgeted Cost**	**Received**	**Spent**	**Budgeted Cost**	**Received**	**Spent**
Transmission- Refurbishments & Replacements										
Transmission & Sub Transmission - Development Projects										
Distribution										
Meters										
Street Lighting										
Total										

NB - The above information should be categorised as follows:

	Current Qtr			Transfers	YTD			Total for year		
	Budgeted Cost	**Received**	**Spent**		**Budgeted Cost**	**Received**	**Spent**	**Budgeted Cost**	**Received**	**Spent**
Load Related (Growth)										
Non-Load Related . Asset Renewal/Replacement										
Reliability & Quality Improvement										
Non-Network . Environmental, Safety & Legal Obligations										
Other										
Total										

NB - Both Tables must agree

Ring Fenced Driven Projects $000

Category	Current Qtr			Transfers	YTD			Total for year		
	Budgeted Cost	Received	Spent		Budgeted Cost	Received	Spent	Budgeted Cost	Received	Spent
Transmission- Refurbishments & Replacements										
Transmission & Sub Transmission - Development Projects										
Distribution										
Structures										
Land										
Meters										
Communications Equipment										
Computer Equipment										
Motor Vehicles										
Street Lighting										
Total										

NB - The above information should be categorised as follows:

	Current Qtr			Transfers	YTD			Total for year		
	Budgeted Cost	Received	Spent		Budgeted Cost	Received	Spent	Budgeted Cost	Received	Spent
Load Related (Growth)										
Non-Load Related . Asset Renewal/Replacement										
Reliability & Quality Improvement										
Non-Network . Environmental, Safety & Legal Obligations										
Other										
Total										

NB - Both Tables must agree

Work in Progress BS04

	Consolidated $000			
	WIP Bal B/F	Work for the Quarte r	Transfer s out	Closin g W.I.P.
Tariff funded				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communicatio ns Equipment				
Computer Equipment				
Motor Vehicles				
Street Lighting				
Total				
PSIP				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communicatio ns Equipment				
Computer Equipment				
Street Lighting				
Total				
Capital Contribution				
Transmission				
Distribution				
Meters				
Street Lighting				
Total				
Ring Fenced				
Transmission				
Distribution				
Structures				
Land				
Meters				

		Load (Growth) Related $000		
	WIP Bal B/F	Work for the Quarte r	Transfer s out	Closin g W.I.P.
Tariff funded				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communications Equipment				
Computer Equipment				
Motor Vehicles				
Street Lighting				
Total				
PSIP				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communications Equipment				
Computer Equipment				
Street Lighting				
Total				
Capital Contribution				
Transmission				
Distribution				
Meters				
Street Lighting				
Total				
Ring Fenced				
Transmission				
Distribution				
Structures				
Land				
Meters				

Communications Equipment				
Computer Equipment				
Street Lighting				
Total				
GRAND TOTAL				

Communications Equipment				
Computer Equipment				
Street Lighting				
Total				
GRAND TOTAL				

NON-LOAD RELATED

	Asset Renewal/Replacement $000			
	WIP Bal B/F	**Work for the Quarter**	**Transfers out**	**Closing W.I.P.**
Tariff funded				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communications Equipment				
Computer Equipment				
Motor Vehicles				
Street Lighting				
Total				
PSIP				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communications Equipment				
Computer Equipment				
Street Lighting				
Total				
Capital Contribution				
Transmission				

	Reliability & Quality Improvement $000			
	WIP Bal B/F	**Work for the Quarter**	**Transfers out**	**Closing W.I.P.**
Tariff funded				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communications Equipment				
Computer Equipment				
Motor Vehicles				
Street Lighting				
Total				
PSIP				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communications Equipment				
Computer Equipment				
Street Lighting				
Total				
Capital Contribution				
Transmission				

Distribution				
Meters				
Street Lighting				
Total				
Ring Fenced				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communications Equipment				
Computer Equipment				
Street Lighting				
Total				
GRAND TOTAL				

Distribution				
Meters				
Street Lighting				
Total				
Ring Fenced				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communications Equipment				
Computer Equipment				
Street Lighting				
Total				
GRAND TOTAL				

NON-NETWORK

	Environmental, Safety & Legal Obligations $000			
	WIP Bal B/F	**Work for the Quarter**	**Transfers out**	**Closing W.I.P.**
Tariff funded				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communications Equipment				
Computer Equipment				
Motor Vehicles				
Street Lighting				
Total				
PSIP				
Transmission				
Distribution				
Structures				

		Other $000		
	WIP Bal B/F	**Work for the Quarter**	**Transfers out**	**Closing W.I.P.**
Tariff funded				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communications Equipment				
Computer Equipment				
Motor Vehicles				
Street Lighting				
Total				
PSIP				
Transmission				
Distribution				
Structures				

Land				
Meters				
Communications Equipment				
Computer Equipment				
Street Lighting				
Total				
Capital Contribution				
Transmission				
Distribution				
Meters				
Street Lighting				
Total				
Ring Fenced				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communications Equipment				
Computer Equipment				
Street Lighting				
Total				
GRAND TOTAL				

Land				
Meters				
Communications Equipment				
Computer Equipment				
Street Lighting				
Total				
Capital Contribution				
Transmission				
Distribution				
Meters				
Street Lighting				
Total				
Ring Fenced				
Transmission				
Distribution				
Structures				
Land				
Meters				
Communications Equipment				
Computer Equipment				
Street Lighting				
Total				
GRAND TOTAL				

Receivables BS05

As At - xxxx	TOTAL	0-30 Days	31-60 Days	61-90 days	91-120 Days	121 Days - 1 Yr	1 yr - 4 yrs	Over 4 yrs
	TT$000	TT$000	TT$000	TT$000	TT$000	TT$000	TT$000	TT$000
Residential A	-	-	-	-	-	-	-	-
Commercial	-	-	-	-	-	-	-	-
Rate B1	-	-	-	-	-	-	-	-
Private	-							
Public	-	-	-	-	-	-	-	-
Central Government	-							
Statutory Boards	-							
State Enterprises	-							
Rate B2	-	-	-	-	-	-	-	-
Private	-							
Public	-	-	-	-	-	-	-	-
Central Government	-							
Statutory Boards	-							
State Enterprises	-							
Industrial D	-	-	-	-	-	-	-	-
Rate D1	-	-	-	-	-	-	-	-
Private	-							
Public	-	-	-	-	-	-	-	-
Central Government	-							
Statutory Boards	-							
State Enterprises	-							
(T&TEC to add rows foe other Industrials)								

Industrial E	-	-	-	-	-	-	-	-
Rate E1	-	-	-	-	-	-	-	-
Private	-							
Public	-	-	-	-	-	-	-	-
Central Government	-							

Statutory Boards	-							
State Enterprises	-							
Rate E2	-	-	-	-	-	-	-	-
Private	-							
Public	-	-	-	-	-	-	-	-
Central Government	-							
Statutory Boards	-							
State Enterprises	-							
Rate E3	-	-	-	-	-	-	-	-
Private	-							
Public	-	-	-	-	-	-	-	-
Central Government	-							
Statutory Boards	-							
State Enterprises	-							
Rate E4	-	-	-	-	-	-	-	-
Private	-							
Public	-	-	-	-	-	-	-	-
Central Government	-							
Statutory Boards	-							
State Enterprises	-							
Rate E5	-	-	-	-	-	-	-	-
Private	-		-					
Public	-	-	-	-	-	-	-	-
Central Government	-							
Statutory Boards	-							
State Enterprises	-							
Public Lighting	-	-	-	-	-	-	-	-
Streetlamps	-							
Traffic Lights	-	-	-	-	-	-	-	-
Recreational Grounds	-							
TOTAL	-	-	-	-	-	-	-	-
Sundry Debtors								

Debt Financing BS06

AS AT - xxxx		*Year ended Dec 31*►					TOTAL
			QTR1	QTR2	QTR3	QTR4	
			$'000	$'000	$'000	$'000	$'000
EXISTING LOANS							
N.G.C.:							
Interest Rate		Balance B/F		-	-	-	-
Loan Type		Principal Payment					-
Issue Date		Interest Paid					-
Maturity Date		Balance C/F	-	-	-	-	-
Loan Purpose		Interest Capitalised					-
Other Loans:							
Interest Rate		Balance B/F		-	-	-	-
Loan Type		Principal Payment					-
Issue Date		Interest Paid					-
Maturity Date		Balance C/F	-	-	-	-	-
Loan Purpose		Interest Capitalised					-
	Please add rows as needed						
		TOTAL EXISTING DEBT B/F	-	-	-	-	-
		Total Principal Paid	-	-	-	-	-
		Total Interest Paid	-	-	-	-	-
		TOTAL EXISTING DEBT C/F	-	-	-	-	-
		Total Interest Capitalised					-

NEW LOANS							
Interest Rate		Balance B/F		-	-	-	-
Loan Type		Principal Payment					-
Issue Date		Interest Paid					-
Maturity Date		Balance C/F	-	-	-	-	-
Loan Purpose		Interest Capitalised					-
Interest Rate		Balance B/F		-	-	-	-
Loan Type		Principal Payment					-
Issue Date		Interest Paid					-
Maturity Date		Balance C/F	-	-	-	-	-
Loan Purpose		Interest Capitalised					-
	Please add rows as needed						
		TOTAL EXISTING DEBT B/F	-	-	-	-	-
		Total Principal Paid	-	-	-	-	-
		Total Interest Paid	-	-	-	-	-
		TOTAL EXISTING DEBT C/F	-	-	-	-	-
		Total Interest Capitalised					-
		TOTAL DEBT B/F	-	-	-	-	-
		Total Principal Paid	-	-	-	-	-
		Total Interest Paid	-	-	-	-	-
		TOTAL DEBT C/F	-	-	-	-	-
		Total Interest Capitalised					-

		RECONCILIATION					
		TOTAL DEBT AS PER MANAGEMENT ACCOUNTS (BALANCE SHEET)					
		DIFFERENCE BETWEEN RAG AND MANAGEMENT ACCOUNTS	-	-	-	-	
		REASON FOR DIFFERENCE :					

Cash Flow Statement BS07

For the period ended - xxxx	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
	$000'	$000'	$000'	$000'
Cash Flows from Operating Activities				
Net Surplus (Deficit) for the year				
Interest Expense				
Depreciation and Amortisation (RAB)				
Depreciation and Amortisation (Non RAB)				
Dividend Income				
Term Deposit Income				
Deferred Interest				
(Decrease)/Increase in Retirement Benefit Obligations				
(Decrease)/Increase in Retirement Benefit Assets				
Loss/(Profit) on Asset Disposal				
	-	-	-	-
Changes in Working Capital:				
Decrease/(Increase) in Inventories				
Decrease/(Increase) in Trade and Other Receivables				
(Increase)/Decrease in Debt Securities				
Increase/(Decrease) in Customer Service Deposits				
(Decrease)/Increase in amounts due to Subsidiary				
Increase/(Decrease) in Trade Payables				
	-	-	-	-
Cash Generated By Operations				
Interest Paid				
	-	-	-	-

Net Cash Generated By Operating Activities	-	-	-	-

Cash Flows from Investing Activities				
Debenture Redemption				
Dividend Received				
Capital Contributions				
Interest Received				
Purchase of Fixed Assets				
Net Decrease/(Increase) in Investments				
Interest Paid				
Proceeds from the sale of Fixed Assets				
Net Cash (Used in)/Provided by Investing Activities	-	-	-	-
Cash Flows from Financing Activities				
Government Advances				
Proceeds from Loans				
Repayment of Loans				
Net Cash (Used in)/Provided by Financing Activities	-	-	-	-
NET CASH AND CASH EQUIVALENTS FROM/(USED IN) PERIOD	-	-	-	-
CASH AND CASH EQUIVALENTS AT THE START OF THE YEAR QUARTER				
CASH AND CASH EQUIVALENTS AT THE END OF THE YEAR QUARTER	-	-	-	-
Cash and Cash Equivalents Represented By:				
Cash and Cash Equivalents				
Bank Advances and Demand Loans				
	-	-	-	-

Income Statement IS01

PERIOD ENDED - xxxx	1st Quarter ended	2nd Quarter ended	3rd Quarter ended	4th Quarter ended	YTD
	xxxx	xxxx	xxxx	xxxx	xxxx
	$	$	$	$	$
REGULATED REVENUES					
Sale of Electricity					-
Other Operating Revenues					-
Total operating revenues	-	-	-	-	-
REGULATED EXPENSES					
Fuel					-
Purchased Power					-
Internal Generation					-
Transmission					-
Distribution					-
Engineering					
Administrative and General					-
Total Operating Expenses	-	-	-	-	-
REGULATED INCOME BEFORE DEPRECIATION	-	-	-	-	-
Less: Depreciation Regulated					
NET OPERATING INCOME	-	-	-	-	-
NON-REGULATED INCOME					
Investment Revenues					-
Dividend from Subsidiary					-
Net Increase in Retirement Benefit Obligations					-
Interest Income					-
Profit on Disposal of Fixed Assets					-
Loss on Foreign Exchange Transactions					-
Miscellaneous Revenues					
	-	-	-	-	-

NON-REGULATED EXPENSES					
Non Regulated Depreciation					-
Net Decrease in Retirement Benefit Obligations					-
Interest Expense and Financial Charges					-
Loss on Disposal of Fixed Assets					-
(Gain) on Foreign Exchange Transactions					-
Other Expenses					
	-	-	-	-	-
SURPLUS/(DEFICIT)	-	-	-	-	-
INCOME BEFORE TRANSFERS	-	-	-	-	-
TRANSFERS TO OTHER FUNDS	-	-	-	-	-
NET SURPLUS/(DEFICIT)	-	-	-	-	-
ACCUMULATED FUND B/F					
ACCUMULATED FUND C/F	-	-	-	-	-
<u>RECONCILIATION</u>					
Total Surplus/(Deficit) as per Management Accounts					
Difference between Management accounts and RAG					
Reason for Difference					

Operating Expenditure IS02

FOR QUARTER ENDED – xxxx	Total $	MW / MWh	Cost per Unit	Account Nos.	Actual Year to Date xxxx $	Forecast Next Quarter $
CONVERSION						
- Capacity						
PowerGen						
Normal Capacity Purchases						
Excess Capacity Purchases						
Trinity Power						
Normal Capacity Purchases						
Excess Capacity Purchases						
TGU						
Normal Capacity Purchases						
Excess Capacity Purchases						
Energy						
PowerGen						
Energy Purchases						
Trinity Power						
Energy Purchases						
TGU						
Energy Purchases						
SUB TOTAL CONVERSION	-	-	-		-	-
FUEL						
Fuel Purchases						
SUB TOTAL FUEL	-	-	-		-	-

FOR QUARTER ENDED - xxxx	Total $	Cost per Unit	Account Nos.	Actual Year to Date xxxx $	Forecast Next Quarter $	
TOBAGO / COVE / INTERNAL GENERATION						
- Advertising/Promotion						
Contracted Labour & Services						
Fuel						
Information Technology						
Material/Supplies						
Other Direct Costs						
Personnel - Employer Contribution to other Benefits						
Personnel - Employer Contribution NIS						
Personnel - Employer Contribution Pension						
Personnel - Overtime						
Personnel - Salaries						
Personnel - Wages						
Rates, Taxes & Insurance						
Rentals/Leases						
Repairs & Maintenance - Buildings						
Repairs & Maintenance - Line & Pole (Fault)						
Repairs & Maintenance - Line & Pole (planned)						
Repairs & Maintenance - Tools & Equipment (Fault)						
Repairs & Maintenance - Tools & Equipment (planned)						
Repairs & Maintenance - Vehicles						
Security						
Sponsorships						
Training						
Vegetation Management						
Vehicle Costs						
SUB TOTAL	-	-		-	-	
MWh Produced Internally						
Number of Employees						

FOR QUARTER ENDED - xxxx	Total $	Cost per Unit	Account Nos.	Actual Year to Date xxxx $	Forecast Next Quarter $
TRANSMISSION					
Advertising/Promotion					
Contracted Labour & Services					
Information Technology					
Material/Supplies					
Other Direct Costs					
Personnel - Employer Contribution to other Benefits					
Personnel - Employer Contribution NIS					
Personnel - Employer Contribution Pension					
Personnel - Overtime					
Personnel - Salaries					
Personnel - Wages					
Rates, Taxes & Insurance					
Rentals/Leases					
Repairs & Maintenance - Buildings					
Repairs & Maintenance - Line & Pole (Fault)					
Repairs & Maintenance - Line & Pole (planned)					
Repairs & Maintenance - Tools & Equipment (Fault)					
Repairs & Maintenance - Tools & Equipment (planned)					
Repairs & Maintenance - Vehicles					
Security					
Sponsorships					
Training					
Vegetation Management					
Vehicle Costs					
SUB TOTAL TRANSMISSION	-	-		-	-
Network Length kms					
Number of Employees					

FOR QUARTER ENDED - xxxx	Total $	Cost per Unit	Account Nos.	Actual Year to Date xxxx $	Forecast Next Quarter $
DISTRIBUTION					
Advertising/Promotion					
Contracted Labour & Services					
Information Technology					
Material/Supplies					
Other Direct Costs					
Personnel - Employer Contribution to other Benefits					
Personnel - Employer Contribution NIS					
Personnel - Employer Contribution Pension					
Personnel - Overtime					
Personnel - Salaries					
Personnel – Wages					
Rates, Taxes & Insurance					
Rentals/Leases					
Repairs & Maintenance - Buildings					
Repairs & Maintenance - Line & Pole (Fault)					
Repairs & Maintenance - Line & Pole (planned)					
Repairs & Maintenance - Tools & Equipment (Fault)					
Repairs & Maintenance - Tools & Equipment (planned)					
Repairs & Maintenance - Vehicles					
Security					
Sponsorships					
Training					
Vegetation Management					
Vehicle Costs					
SUB TOTAL DISTRIBUTION	-	-		-	-
Network Length Kms					
Number of Employees					

FOR QUARTER ENDED - xxxx	Total $	Cost per Unit	Account Nos.	Actual Year to Date xxxx $	Forecast Next Quarter $
ENGINEERING					
Advertising/Promotion					
Contracted Labour & Services					
Information Technology					
Material/Supplies					
Other Direct Costs					
Personnel - Employer Contribution to other Benefits					
Personnel - Employer Contribution NIS					
Personnel - Employer Contribution Pension					
Personnel - Overtime					
Personnel - Salaries					
Personnel – Wages					
Rates, Taxes & Insurance					
Rentals/Leases					
Repairs & Maintenance - Buildings					
Repairs & Maintenance - Line & Pole (Fault)					
Repairs & Maintenance - Line & Pole (planned)					
Repairs & Maintenance - Tools & Equipment (Fault)					
Repairs & Maintenance - Tools & Equipment (planned)					
Repairs & Maintenance - Vehicles					
Security					
Sponsorships					
Training					
Vegetation Management					
Vehicle Costs					
SUB TOTAL ENGINEERING	-	-		-	-
Number of Employees					

FOR QUARTER ENDED - xxxx	Total $	Cost per Unit	Account Nos.	Actual Year to Date xxxx $	Forecast Next Quarter $
ADMINISTRATIVE AND GENERAL					
Advertising/Promotion					
Audit Fees					
Call Centre Operations (internal)					
Contracted Labour & Services					
Customer Service Call Centre Operation (Outsourced)					
Disaster Fund					
Fees & Consultancy					
Information Technology					
Insurance - Buildings					
Insurance - Tools & Equipment					
Insurance - Vehicles					
Legal Fees					
Materials & Supplies					
Meter Billings & Collection					
Meter Reading					
Other Direct Costs					
Pension Plan Admin. Costs					
Personnel - Employer Contribution NIS					
Personnel - Employer Contribution Pension					
Personnel - Employer Contribution to other Benefits					
Personnel - Overtime					
Personnel - Salaries					
Personnel - Wages					
Rates and Taxes					
Rentals/Leases					
Repairs & Maintenance - Buildings					
Repairs & Maintenance - Tools & Equipment(fault)					
Repairs & Maintenance - Tools & Equipment(planned)					
Repairs & Maintenance - Vehicles					
RIC - Cess					
Security					
Sponsorship					
Standards Scheme /Penalties					
Street Lighting - Operations, Complaints, Crews					
Training					
Vehicle Costs					
SUB TOTAL ADMINISTRATIVE AND GENERAL	-	-	-		-
Number of Employees					

FOR QUARTER ENDED - xxxx	Total $	Cost per Unit	Account Nos.	Actual Year to Date xxxx $	Forecast Next Quarter $
OTHER					
Depreciation					
Amortization of Capital Contributions					
Interest & Finance Costs					
Loss / (Gain) on Exchange					
Loss / (Gain) on Disposal of Fixed Assets					
SUB TOTAL OTHER	-	-	-		-
TOTAL EXPENDITURE	-	-	-		-

RECONCILIATION BETWEEN RAG AND T&TEC MANAGEMENT ACCOUNTS					
Total OPEX as per T&TEC Management Accounts					
Difference Between RAG and T&TEC					
Reason for Differences:					

Revenue IS03

Electricity Sales Quarter Ended - xxxx		No of Customers	Energy Consumption kWhs	Capacity Consumption kVAs	Revenue from Fixed Charge $	Revenue from Energy Charge (kWh) $	Revenue from Capacity Consumption (kVA) $	Total Revenue $	YEAR TO DATE $
Residential A									
	Up to 200 kWh								-
	201-700 kWh								-
	701-1400 kwh								
	over 1,400 kWh								-
	Total Residential	-	-	-	-	-	-	-	-
Commercial									
	Rate B1								-
	Rate B2								-
	Total Commercial	-	-	-	-	-	-	-	-
Industrial									
	Rate D1								-
	Rate D2								-
	Rate D3								-
	Rate D4								-
	Rate D5								-
	Rate E1								-
	Rate E2								
	Rate E3								
	Rate E4								
	Rate E5								-
	Total Industrial	-	-	-	-	-	-	-	-
Public Lighting									
	Streetlamps								
	Traffic Lights								
	Recreational Grounds								
	Total Public Lighting	-	-	-	-	-	-	-	-
	TOTAL REVENUES	-	-	-	-	-	-	-	-

Other Revenue IS04

PERIOD ENDED - xxxx	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	YTD
	$'000	$'000	$'000	$'000	$'000
Other Regulated Income					
Meter Check at customer's request					-
Visit for non-payment of accounts					-
Install meter and reconnect secondaries					-
Reconnect, disconnect and/or change meter					-
Reposition of secondaries					-
Change and/or reposition meter					-
Disconnection for non-payment					-
Reconnection after disconnection for non-payment					
(List to amended to include new miscellaneous charges for newly regulated services)	-	-	-	-	-
Other Non-Regulated Income					
Temporary Connection (non-metered)					-
Pole Rentals -TSTT/Cable TV					-
					-
Rentals - other utility property					-
Profit/Loss major contracting					-
Other Light & Power Revenues					-
Dividend Income					-
Other non-regulated revenue					-
Capital Contributions					
	-	-	-	-	-
TOTAL OTHER INCOME	-	-	-	-	-
RECONCILIATION					
Total Other Income as per Management Accounts					
Difference between Management accounts and RAG					
Reason for Difference :					

Employee Absenteeism and Sick Leave IS05

For the Quarter Ended xxxx				
Staff Complement				
Classification	Permanent	Temporary	Total	
Executive & Management				
Professional/Technical				
Administrative				
Security				
Hourly Rated				
Total				
Staff Absenteeism				
Classification	Sick Leave	Extended Sick Leave	Emergency	Total
Executive & Management				
Professional/Technical				
Administrative				
Security				
Hourly Rated				

Annual Performance Review IS06

		For the Year Ended xxxx	
		Total as per Determination $ '000	Actual $ '000
Revenue:			
Sale of Electricity			
Other Regulated Income			
	Total	-	-
Operating and Maintenance Expenditure:			
Conversion Costs			
Internal Generation			
Fuel Costs			
Engineering			
Transmission and Distribution Costs			
Administrative and General			
	Total	-	-
	Operating Surplus(Deficit)	-	-
Regulatory Depreciation			
Return on Capital/RAB			
Adj: Other Revenue			
Return on Working Capital			
Total Revenue Requirement		-	-

Worksheet Reference No: CS-01
Worksheet Name Number of Complaints Reported by Type
Reporting Period

Complaint Type	No. Complaints Unresolved Brought Forward	No. Complaints B/F Resolved in the Current Period	No. Complaints Received for the Current Period	No. Current Complaints Resolved	No. Complaints Unresolved Carried Forward
Billing Classification					
Billing Query					
Retroactive Billing Adjustment					
Disconnection / Reconnection					
Inaccurate Meter Reading					
Reduction in Reserve Capacity					
High Voltage					
Low Voltage					
Voltage Fluctuations					
Line Phase Out					
Burst Service Leads					
Wires Clashing/ Sparking					
Over-Hanging / Burst Wires					
Removal/Relocation of Lines					
Momentary Power Outages					
Power Outages					
Defective Street Lights					
Installation of Streetlight					
Rotten / Leaning / Broken / Termite Pole					
Tree Trimming					
Value of Capital Contribution					
Request for Service					
Damage to Property					
Other Types of Liability Claims					
Illegal Connection					
Malfunctioning / Broken Meter					
Other					
Total	**0**		**0**	**0**	**0**

Service Provider T&TEC
Worksheet Reference No: CS-02
Worksheet Name Disconnections/Reconnections
Reporting Period

Rate Category	No. of Disconnections						No. of Re-connection	No. of New Payment Plans Taken Out	Average time for reconnection after payment arrangement (hours)
	Non Payment of Bill	Illegal Connection	Customer Request	Unsafe Installation	Meter Tampering	Other			
Residential A									
Commercial									
Industrial									
Total	0	0	0	0	0	0	0	0	

Worksheet Reference No: CS-03
Worksheet Name Retroactive Billing
Reporting Period

Reasons for Retroactive Billing	No. of Customers Notified	No. of cases Responded Within 2 Weeks	No. of Second Notifications Issued/Sent	No. of Customer Agreed with the Retroactive Bill	No. of Customer Disputing the Retroactive Bill
Classification incorrect					
Billing Incorrect					
Meter Malfunction					
Meter Inaccessible					
Tampered installation					
Change in use					
Other					
Total	**0**	**0**	**0**	**0**	**0**

Worksheet Reference No: CS-04
Worksheet Name Disconnections In Error
Reporting Period

Rate Category	No. of Disconnection in Error	Average Time Out of Supply (hours)	No. of Customers reconnected within 8 Hrs	No. of Apology Issued within 3 days
Residential A 0-400 kWh > 400 kWh Commercial Industrial				
Total	**0**	**0**	**0**	**0**

*To be amended for new tiers

Worksheet Reference No: CS-05
Worksheet Name Damaged Appliance/Equipment
Reporting Period

Rate Category	No of Claims B/F	No. of New Claims Received	No. of new Claims Processed	No. Notified of Position on Settlement Within 1 Month	No. Settlement Accepted	* Average time for payment
Residential A Commercial Industrial						
Total	**0**	**0**	**0**	**0**	**0**	**0**

SYSTEM LOSSES - PMR 1

Quarter/Year	Energy Units Billed (kWh)	Energy Units Purchased/ Generated (kWh)	Collections in $	Billings in $
January - March				
April - June				
July - September				
October - December				
Total	**0**	**0**	**0**	**0**

TRANSMISSION TRIPS AND INTERRUPTIONS AFFECTING CUSTOMERS - PMR 2

Month	Number of Transmission circuit interruptions			Number of interruptions restored within 3 hrs			Number of interruptions restored between 3-5 hrs			Number of interruptions restored after 5 hrs		
	33kV	66kV	132kV	33kV	66kV	132kV	33kV	66kV	132kV	33kV	66kV	132kV
Jan-												
Feb-												
Mar-												
Apr-												
May-												
Jun-												
Jul-												
Aug-												
Sep-												
Oct-												
Nov-												
Dec-												
TOTAL												

Heat Rate - PMR 3

Plant	Energy (GWh	Energy (TJ)	Volume (mscf)	Heat Rate (kj/kWh
PowerGen Pt. Lisas 1994				
Power Gen Pt Lisas 2005				
PowerGen Penal				
Trinity Power				
Cove Estate, Tobago				
Trinidad Generation Unlimited (TGU)				