

**T&TEC's**  
**Annual Performance Indicator**  
**Report**  
*For the Year*  
**2020**

March  
2022

Information  
Document

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## EXECUTIVE SUMMARY

This Annual Performance Indicator Report provides an assessment of the Trinidad and Tobago Electricity Commission's (T&TEC)<sup>1</sup> performance for the year 2020. It focuses on the key performance indicators identified in the *“Performance Monitoring and Reporting (PMR) Framework for the Electricity Transmission and Distribution Sector (2005)”* and the *“Regulation of Electricity Transmission and Distribution Sector (June 01, 2006 to May 31, 2011) - Final Determination: Rates and Miscellaneous Charges (2006)”*, hereinafter called the “Final Determination (2006)”.

The assessment of T&TEC is focused on those aspects of performance that impact customers, using targets set out in the Final Determination (2006), historical performance, and performance metrics of electricity utilities in other jurisdiction where appropriate. The indicators included in this Report are grouped as follows:

1. Aggregate Performance – which covers indicators such as electricity service coverage, number of customers, electricity purchases and sales, and total system losses;
2. Economic Data – which covers productivity indicators such as electricity sales per employee, customer per employee and electricity consumption per capita;
3. Network Reliability – which covers indicators such as System Average Interruption Frequency Index (SAIFI), System Average Interruption Duration Index (SAIDI), Customer Average Interruption Duration Index (CAIDI) and number of transmission trips & interruptions affecting customers;
4. Customer Responsiveness and Service – which covers number of complaints received, number of complaints resolved and the complaints resolutions rate;
5. Specific Directives – which cover repairs and maintenance of pole-mounted distribution transformers and street lighting repairs; and
6. Financial Performance and Efficiency – which covers debt financing, liquidity and financial efficiency indicators.

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<sup>1</sup> T&TEC is responsible for the transmission and distribution of electrical power to customers within Trinidad and Tobago. T&TEC also has its own generating assets located in Tobago, which had a de-rated capacity of 83.1 MW at the end of 2020. De-rated capacity refers to the reduction in the maximum operating level of a plant below its name plate capacity as a result of aging, operating constraints or other factors that impact its output.

Despite the challenges brought on by the COVID-19 pandemic in 2020, T&TEC provided a safe and reliable electricity supply to its customers over the period. T&TEC's performance for the review period is summarized below.

### *Aggregate Performance*

T&TEC maintained an electricity service coverage of 99.3% in 2020, with only a small percentage of the population not connected to the national electricity grid. Its customer base expanded by 1.5% from 493,965 in 2019 to 501,309 at the end of 2020. The residential class accounted for 88.3% of T&TEC's customer base, followed by the commercial class (10.9%), and the industrial and street lighting classes (1%).

T&TEC's energy purchases from the power generators declined marginally (0.2%) from 2019 to 2020; whereas, total electricity sales increased marginally (0.2%) over the same period.<sup>2</sup> T&TEC also reported a small decline in total system losses<sup>3</sup>, representing an improvement in performance. This change was consistent with the increase in electricity sales over the period, as a decrease in total system losses would generally result in increased sales. T&TEC failed to meet the total system losses target of 6.75%<sup>4</sup> set by the Regulated Industries Commission (RIC), despite the improved performance.

### *Economic Data*

Over the period, there appeared to be some improvement in T&TEC's performance with respect to the productivity indicators. The ratio of electricity sales per employee increased by 3.2%, from 2,808,950 kWh in 2019 to 2,899,200 kWh in 2020; while its customer per employee ratio increased by 4.8%, from 165 in 2019 to 173 in 2020. T&TEC also reported a marginal decline (0.03%) in the country's electricity consumption per capita to 6,158 kWh in 2020.<sup>5</sup> Trinidad and Tobago's electricity consumption per capita was relatively higher than several countries within the Latin

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<sup>2</sup> T&TEC's energy purchases declined from 8,877,813,000 kWh in 2019 to 8,862,252,000 kWh in 2020; whereas, total electricity sales increased from 8,401,569,265 kWh to 8,416,376,513 kWh over the same period.

<sup>3</sup> T&TEC's System Losses declined from 9.22% in 2019 to 9.05% in 2020

<sup>4</sup> This target, as set in the Final Determination (2006), was expected to be achieved by the end of the regulatory period June 1<sup>st</sup>, 2006 to May 31, 2011.

<sup>5</sup> Trinidad and Tobago's electricity consumption per capita fell from 6,160 kWh in 2019 to 6,158 kWh in 2020.

American and Caribbean region partly due to its low electricity rates and its high level of electricity consumption for industrial purposes.

### *Network Reliability*

System reliability weakened, as demonstrated by the reliability indicators. SAIFI increased from 4.80 interruptions per customer in 2019 to 5.01 interruptions per customer in 2020. While SAIDI increased from 463 minutes to 483 minutes over the same period. CAIDI, however, improved slightly over the period. T&TEC also experienced a 17.8% decline in the number of trips and interruptions on the transmission network from 45 in 2019 to 37 in 2020. This decline was partially influenced by changes in weather related conditions over the period. The majority of the trips and interruptions occurred on the 33kV circuit. T&TEC restored 97.3% of the total number of trips and interruptions on the network within five hours, as compared to 93.3% in 2019.

### *Customer Responsiveness and Service*

T&TEC reported a 21.3% decline in the number of customer complaints, from 52,296 in 2019 to 41,175 in 2020. This decline was an indicative of the impact of COVID-19 restrictions on T&TEC's daily operations, including the suspension of certain non-essential activities such as the customer complaints facility at their service centres, coupled with the simplification of its online platform which allowed customers to easily pay and access bill balances. Amongst the customer complaints, there were 151 written customer complaints. The majority of customer complaints were related to poles and other<sup>6</sup> issues (31,818), followed by billing queries (8,838), damaged appliances (265) and high/low voltage complaints (254) respectively. At the end of 2020, T&TEC resolved 38,469 or 93.4% of the total complaints received, as compared to 95.2% in 2019.

### *Specific Directives*

T&TEC reported a 2.1% increase in the number of pole-mounted transformers in service, from 39,779 in 2019 to 40,629 in 2020. The annual percentage of these pole-mounted distribution transformers inspected/serviced by T&TEC increased from 53.1% in 2019 to 68.8.3% in 2020. Thus, T&TEC met the minimum target of 20% set by the RIC. T&TEC also received 24,347 reports of non-functioning streetlights from customers and members of the public in 2020. Of

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<sup>6</sup> 'Other' complaints include, but are not limited to, defective streetlights, power outages, delays in the delivery of service and line relocation and removals.

these, T&TEC repaired 24% within the stipulated 7-day period, compared to 22.2% in 2019. T&TEC undertook 7,392 street lighting repairs in response to failures detected by its crews and other staff. Overall, T&TEC completed 30,981 street lighting repairs in 2020, compared to 34,957 in 2019.

#### *Financial Performance and Efficiency*

T&TEC's financial performance and efficiency continued to be below par in 2020. Similar to 2019, operating revenue for the period (TT\$3,098,179,554) was below operating expenditure (TT\$4,652,071,799). Also, Funds from Operations (FFO)<sup>7</sup> decreased from (TT\$1,066,976,786) in 2019 to (TT\$1,553,892,245) in 2020. Thus, suggesting that T&TEC needs a significant improvement in its revenue position to achieve profitability and improve its overall financial sustainability. In this regard, the RIC initiated its Price Review for T&TEC in December 2020.

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<sup>7</sup> Funds from Operations refers to the cash flows from operations of the business.

## **SECTION 1.0 INTRODUCTION**

### **1.1 Background**

The RIC is the economic regulator of the electricity, water and wastewater sectors in Trinidad and Tobago. In carrying out its regulatory functions, the RIC is guided by the legislative and regulatory framework set out in the RIC Act No. 26 of 1998. Section 6(1) of the RIC Act empowers the RIC to, amongst other things, carry out studies of efficiency and economy of operation and of performance by service providers and publish the results thereof. In accordance with this mandate, the RIC developed the “*Performance Monitoring and Reporting (PMR) Framework for the Electricity Transmission and Distribution Sector*” in 2005 to monitor the services<sup>8</sup> of the sector.

The PMR Framework (2005) requires T&TEC to provide data on a core set of financial, operational and service quality measures, quarterly and annually. This dataset includes aggregate data on electricity coverage, number of customers, electricity purchases and electricity sales. T&TEC’s network reliability and system losses are also included, as well as other performance metrics, such as responsiveness to customers and service, equipment maintenance, and financial status.

Further to the PMR Framework (2005), the RIC published key performance indicators in the Final Determination (2006) to monitor T&TEC’s performance. The Final Determination (2006) also outlined specific directives that were to be followed by T&TEC during the regulatory period (2006-2011). Accordingly, the RIC has been assessing T&TEC’s performance as of 2006, and has reported its findings annually in Performance Indicator Reports. The assessment of T&TEC focuses on those aspects of performance that impact customers, using targets set out in the Final Determination (2006), historical performance, and performance metrics of electricity utilities in other jurisdiction where appropriate.

This is the fourteenth Annual Performance Indicator Report for T&TEC. All the data in this report were supplied by T&TEC, except where specified otherwise.

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<sup>8</sup> Services in this context refer to the delivery of electricity supply to meet the customers’ load requirements.



## **1.2 Purpose of Document**

The purpose of this document is to monitor and report on T&TEC's performance over the annual period 2020, with respect to the performance indicators and specific directives outlined in the Final Determination (2006). The findings of the Report are expected to provide comprehensive information to all stakeholders about the services that they receive from T&TEC, while simultaneously incentivising T&TEC to improve its performance.

## **1.3 Structure of Document**

This document is divided into three sections. **Section 1.0** explains the background, purpose and structure of the report. **Section 2.0** reviews T&TEC's performance with respect to some broad performance criteria such as Aggregate Performance, Economic Data, Network Reliability, Customer Responsiveness and Service, Specific Directives, and Financial Performance and Efficiency. Lastly, **Section 3.0** comprises the conclusion and recommendations for T&TEC.

An abridged list of key performance indicators for the electricity transmission and distribution sector is contained in the appendix.<sup>9</sup>

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<sup>9</sup> The general list of performance indicators for the electricity transmission and distribution sector is contained in the Performance Monitoring and Reporting (PMR) Framework (2005).

## **SECTION 2.0 PERFORMANCE REVIEW**

### **2.1 Aggregate Performance**

This section, summarizes T&TEC’s aggregate performance over the period with respect to the following indicators: electricity service coverage, customer numbers, electricity purchases and sales, and total system losses.

#### **2.1.1 Electricity Service Coverage**

Electricity service coverage indicates the level of the population’s access to the electricity service. This indicator is important for understanding the extent to which households across the country are connected to the national grid. The indicator may also be used to gauge the potential for growth in a country’s commercial and industrial sectors. T&TEC’s electricity service coverage for Trinidad and Tobago remained at an estimated 99.3%, with only a small percentage of the population not supplied by the national electricity grid.<sup>10</sup>

#### **2.1.2 Number of Customers by Class and Area**

T&TEC’s customers are separated into to specific classes, on the basis of the customer’s electrical load and supply voltage. These classes include residential, commercial and industrial customers.<sup>11</sup> All customers are billed for energy consumed, measured in kilowatt hour(s) (kWh). Industrial customers have an additional charge for demand, measured in kilovolts-ampere (kVA). A separate classification, “street lighting”, is used for billing private customers and governmental agencies for electricity that is consumed by private and public outdoor lighting, respectively.

There were 501,309 active customer accounts at the end of 2020, as shown in table 1. This represented a 1.5% increase from the 493,965 active accounts on record at the end of 2019. The residential class accounted for the largest share of T&TEC’s customer base (442,415 or 88.3%). This was followed by the commercial class (54,740 or 10.9%), and the industrial and street lighting classes, which collectively accounted for less than 1% of T&TEC’s customer base. The street

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<sup>10</sup> This estimate for electricity service coverage was provided by T&TEC.

<sup>11</sup> Residential (Domestic) Rate A is supplied at 115/230V at loads less than 50kVA. Commercial Rate B is supplied at 115/230V or 230/400V at loads less than 50kVA. Commercial Rate B1 is supplied at 115/230V, 230/400V, 6.6kV, 12kV or 33kV at loads greater than 50kVA but less than 350kVA. Industrial Rates D1-5 and E1-5 are supplied at 115/230V, 230/400V, 6.6kV, 12kV, 33kV, 66kV or 132kV at loads greater than 50kVA, but less than 25,000kVA.

lighting class had the highest growth amongst T&TEC’s customer classes, expanding by 2.2% in 2020.

**Table 1: Number of Active Accounts by Class (2019 - 2020)**

Year	Customer Class				Total
	Residential	Commercial	Industrial	Street Lighting	
<b>2020</b>	<b>442,415</b>	<b>54,740</b>	<b>4,107</b>	<b>47</b>	<b>501,309</b>
2019	435, 439	54,422	4,058	46	493,965
Percentage Change (%)	1.6%	0.6%	1.2%	2.2%	1.5%

T&TEC supplies electric power to customers across Trinidad and Tobago via a single interconnected grid. Customers are grouped into five main distribution areas, namely North, South, East, Central and Tobago. In 2020, the South distribution area had the largest number of active customer accounts (150,696) and represented 30.1% of T&TEC’s customer base (see table 2). Conversely, Tobago had the smallest number of active accounts, with 29,800 or 5.9% of the customer base. The largest growth over the period was reported in both the East and Central distribution areas, which each expanded by 1.9% in 2020.

**Table 2: Number of Active Accounts by Area (2019 - 2020)**

Year	Distribution Area					Total
	North	South	East	Central	Tobago	
<b>2020</b>	<b>95,712</b>	<b>150,696</b>	<b>136,599</b>	<b>88,502</b>	<b>29,800</b>	<b>501,309</b>
2019	95,113	148,708	134,014	86,847	29,283	493,965
Percentage Change (%)	0.6%	1.3%	1.9%	1.9%	1.8%	1.5%

### 2.1.3 Electricity Purchases (kWh)

T&TEC purchases bulk electrical energy from three (3) independent power producers (IPPs) in Trinidad and Tobago, namely the Power Generation Company of Trinidad & Tobago Limited (PowerGen), Trinity Power Limited, and Trinidad Generation Unlimited (TGU).<sup>12</sup> Table 3 shows the amount of electricity purchased by T&TEC for the years 2019 and 2020.

<sup>12</sup> Additionally, T&TEC has its own generating assets located in Tobago, which had a de-rated capacity of 83.1 MW at the end of 2020. De-rated capacity is the operation of the plant at less than its rated maximum power capability

In 2020, T&TEC purchased 8,862,252,000 kWh of electrical energy from the IPPs, compared to 8,877,813,000 kWh in 2019. This change represented a 0.2% decline in energy purchases over the period. In 2020, T&TEC purchased the highest amount of electricity during July-September (Q3) and the lowest during April-June (Q2).

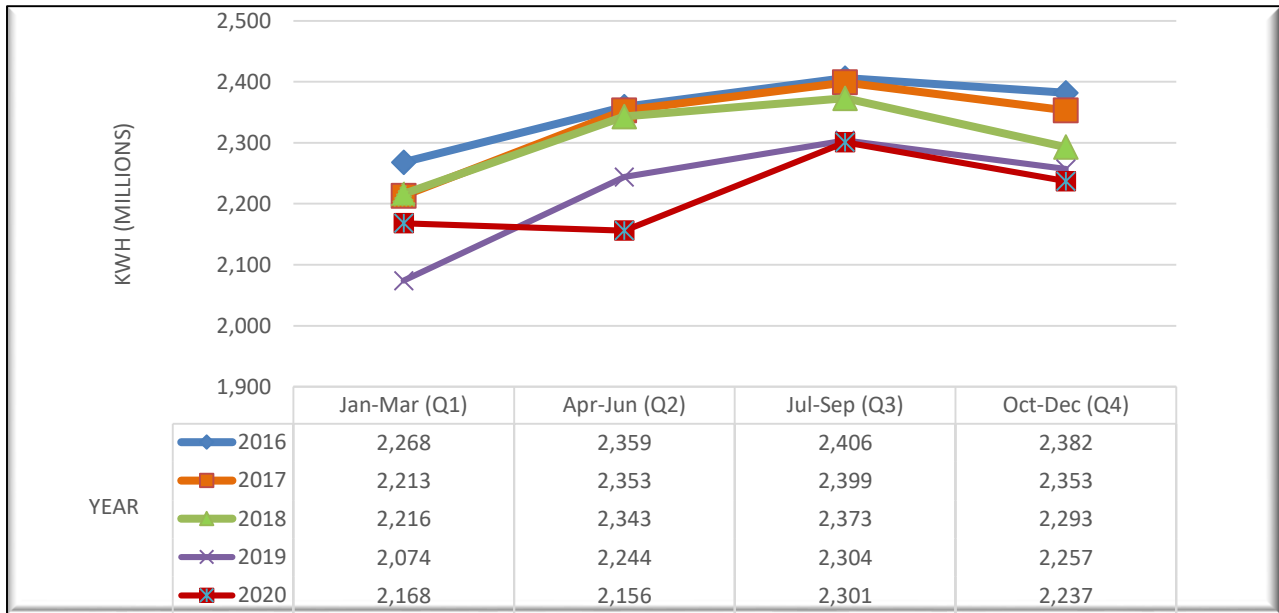
**Table 3: Electricity Purchases, kWh (2019 - 2020)**

Month	Electricity Purchases (kWh)	
	2020	2019
Jan-Mar (Q1)	<b>2,167,791,000</b>	2,073,598,000
Apr-Jun (Q2)	<b>2,156,475,000</b>	2,243,625,000
Jul-Sep (Q3)	<b>2,300,571,000</b>	2,304,242,000
Oct-Dec (Q4)	<b>2,237,415,000</b>	2,256,348,000
Total	<b>8,862,252,000</b>	8,877,813,000

A graphical representation of T&TEC’s electricity purchases (kWh) over the five-year period 2016 to 2020 is shown in figure 1. Therein it can be seen that T&TEC’s quarterly electricity purchases followed a fairly similar trend<sup>13</sup> over the period, with peak purchases recorded in the third quarter (July-September) and the lowest purchases in the first quarter (January-March). T&TEC reported that the peaks in electricity purchases over the period were partly due to seasonal variations in the manufacturing and industrial sectors. Overall, there was a 5.9% decline in T&TEC’s kWh purchases, which moved from 9,415,044,000 kWh in 2016 to 8,862,252,000 kWh in 2020.

<sup>13</sup> The data showed a slight variation from this trend in 2020, as the lowest electricity purchases were recorded in the second quarter (April-June) of that year. This variation in purchases may be an indication of T&TEC’s response to a fall in demand associated with the slowdown in business activity due to COVID-19 restrictions.

**Figure 1: Electricity Purchases (kWh): Five-Year Trend (2016 - 2020)**



**2.1.4 Electricity Sales (kWh)**

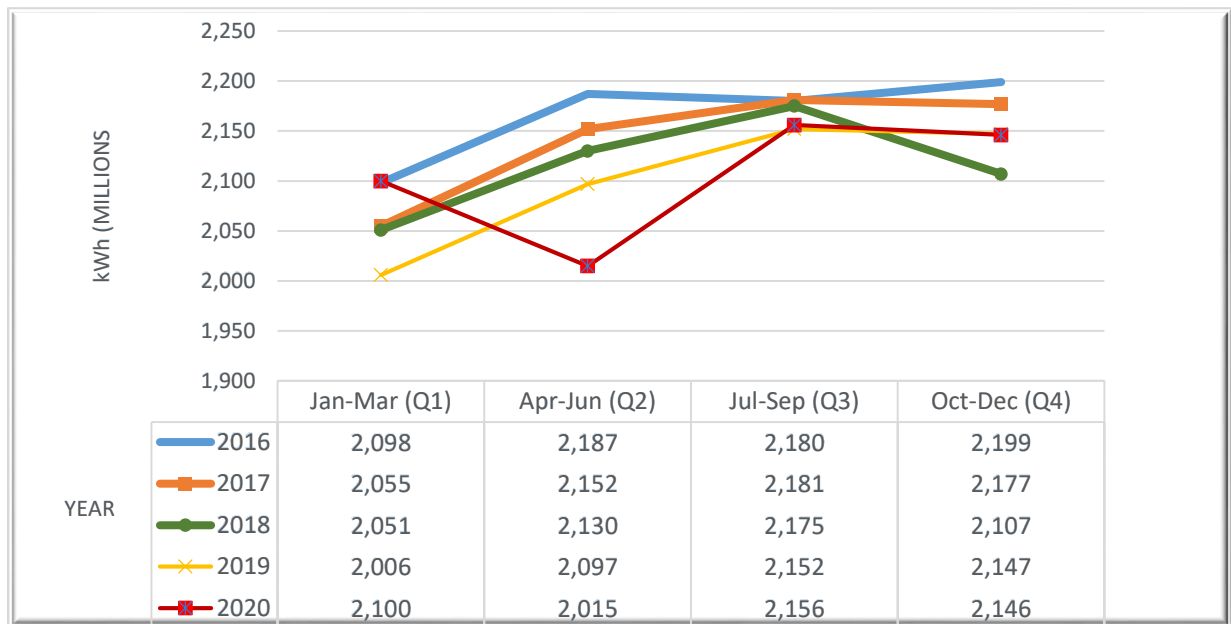
T&TEC reported total electricity sales of 8,416,376,513 kWh in 2020, compared to 8,401,569,265 kWh in 2019 (see table 4). This change represented a 0.2% increase in sales over the period. The highest value of electricity sales was recorded in the Central distribution area (2,678,629,110 kWh), and accounted for 31.8% of total sales. The relatively high electricity sales (or consumption) in the Central area corresponds with the presence of the Point Lisas Industrial estate in the area, which has the highest concentration of large industrial customers in Trinidad and Tobago.

**Table 4: Electricity Sales per Distribution Area, kWh (2019 - 2020)**

Month	Electricity Sales per Distribution Area (kWh)					Total
	North	South	East	Central	Tobago	
Jan – Mar (Q1)	387,985,628	438,994,960	485,617,711	711,420,203	75,677,279	2,099,695,781
Apr – Jun (Q2)	418,317,512	437,368,450	460,830,245	616,683,322	81,579,913	2,014,779,442
Jul – Sep (Q3)	394,894,294	464,664,893	504,095,325	715,952,484	76,456,348	2,156,063,344
Oct – Dec (Q4)	445,405,941	487,834,211	489,089,540	634,573,101	88,935,153	2,145,837,946
<b>Total (2020)</b>	<b>1,646,603,375</b>	<b>1,828,862,514</b>	<b>1,939,632,821</b>	<b>2,678,629,110</b>	<b>322,648,693</b>	<b>8,416,376,513</b>
Total (2019)	1,680,312,141	1,798,261,398	1,934,041,988	2,652,209,330	336,744,408	8,401,569,265

A graphical representation of T&TEC’s electricity sales (kWh) over the five-year period 2016 to 2020 is shown in figure 2. Overall, electricity sales declined by 2.8% over the period, moving from 8,662,919,960 kWh in 2016 to 8,416,376,513 kWh in 2020. Quarterly electricity sales fluctuated throughout the period, and followed a pattern that is comparable to that displayed by electricity purchases.

**Figure 2: Electricity Sales (kWh): Five-Year Trend (2016 - 2020)**

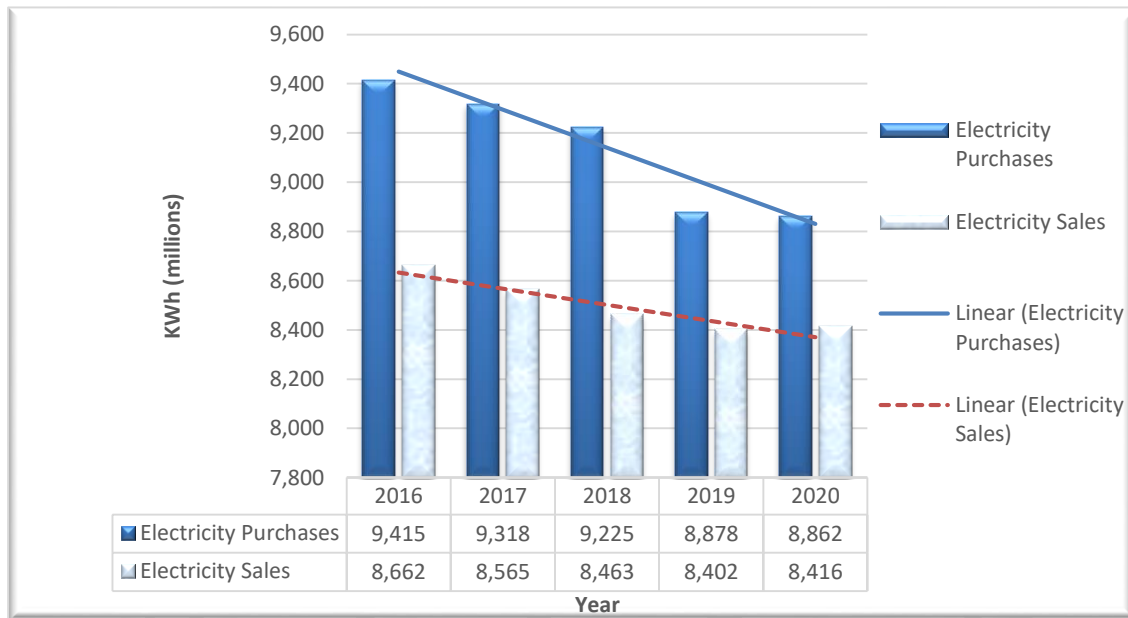


### 2.1.5 Electricity Purchases vs. Electricity Sales Trends

T&TEC measures the electricity purchases from the power generators when it is received, whereas electricity sales is computed when the customers' bills are prepared. The latter takes place at various times, depending on the billing cycle of the customer. As a result, the trends in peaks and troughs for these two metrics may not coincide on a quarterly basis and can affect the calculation of total system losses, which is discussed in section 2.1.6.

A comparison of T&TEC's electricity purchases against electricity sales for the five (5) year period 2016-2020 is shown in figure 3. It indicates that both electricity purchases and sales followed a similar trend, with a general decrease in both indicators over the past five years. The rate of decrease in electricity purchases appeared to be greater than the rate of decrease in electricity sales. This is an indication that the disparity between the two metrics has been decreasing.

**Figure 3: Electricity Purchases vs. Sales: Five-Year Trend (2016 - 2020)**



### **2.1.6 Total System Losses**

All of the electrical energy that T&TEC purchases from the power generators is not available for sale to customers because of losses in the power lines and other components of the transmission and distribution system. The difference between the quantity of electricity entering T&TEC's network and that which is billed to customers is referred to as 'total system losses'. Total system losses usually result from a combination of technical and non-technical losses. Technical losses are due to the physical characteristics of the network, such as the type of conductor used to construct the transmission and distribution lines, and the configuration and operation of the system. Whereas, non-technical losses, or commercial losses, are generally due to metering errors, recording errors and electricity theft. These losses occur when electrical energy is delivered to customers, but the amount of energy billed is less than the amount delivered. Total system losses represent a loss of revenue to the utility and therefore, should be minimised.

The RIC set a target of 6.75% for total system losses, which was to be achieved by T&TEC by the end of the regulatory period June 1, 2006 to May 31, 2011. T&TEC reported total system losses of 9.05% in 2020, compared to 9.22% in 2019 (see table 5). T&TEC's small improvement in performance with respect to this indicator is noted, however, T&TEC again failed to meet the stipulated target. In 2020, system losses recorded for each quarter were highest during the second quarter (April – June) and lowest during the first quarter (January – March). The variations in the quarterly values of system losses were likely due to the lag between the real-time energy purchased from the generators and the delayed billing for energy sold to customers, as previously mentioned in section 2.1.5. T&TEC's performance for total system losses was better than that of a few electric utilities within the Caribbean region, including those in Belize (11.7%) and Jamaica (26.1%).<sup>14</sup>

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<sup>14</sup> Comparisons were based on data availability. Data for the current period was unavailable during the preparation of this report. Sources include: the JPS Annual Report 2019, <https://www.jpSCO.com/annual-reports/> and the Belize Electricity Limited (BEL) Annual Reports 2019, [http://www.bel.com.bz/annual\\_reports.aspx](http://www.bel.com.bz/annual_reports.aspx)



**Table 5: Total System Losses (2019 - 2020)**

Period	Energy Units Sold/Consumed (kWh)	Energy Units Purchased/Generated (kWh) <sup>15</sup>	System Losses <sup>16</sup> (%)
Jan – Mar (Q1)	2,099,695,781	2,265,908,000	7.34%
Apr – Jun (Q2)	2,014,779,442	2,251,074,000	10.50%
Jul – Sept (Q3)	2,156,063,344	2,402,112,000	10.24%
Oct – Dec (Q4)	2,145,837,946	2,334,669,000	8.09%
<b>Total (2020)</b>	<b>8,416,376,513</b>	<b>9,253,763,000</b>	<b>9.05%</b>
Total (2019)	8,401,569,265	9,254,552,000	9.22%

## 2.2 Economic Data

In this section, T&TEC’s performance was examined against specific economic indicators that are reported on a “per employee” or “per customer” basis. These include electricity sales per employee, customers per employee and consumption per capita.

### 2.2.1 Electricity sales per employee (kWh) and Customers per employee

Electricity sales per employee and customers per employee are two indicators that are generally used to measure labour productivity, and the efficient use of resources in the electricity sector. Table 6 shows T&TEC’s performance with respect to both indicators for the years 2019 and 2020.

T&TEC reported a 2.9% decline in the number of employees, from 2,991 in 2019 to 2,903 in 2020. Accordingly, kWh sales per employee increased by 3.2%, from 2,808,950 kWh in 2019 to 2,899,200 kWh in 2020, while revenue per employee rose by 4.0% from TT\$987,136 in 2019 to TT\$1,026,629. There was also a 4.8% improvement in T&TEC’s customers per employee ratio, from 165 in 2019 to 173 in 2020.

<sup>15</sup> Energy Units Purchased/Generated (kWh) represents the sum of T&TEC’s energy purchases from the power generators and its own-generation assets in Tobago.

<sup>16</sup> The formula for calculating total system losses is outlined in the Appendix.

**Table 6: Other Economic Data (2019-2020)**

Indicator	Year		% Change
	2020	2019	
Number of Employees	2,903	2991	(2.9)%
Electricity Sales (kWh)	8,416,376,513	8,401,569,265	0.2%
<b>Electricity Sales per Employee (kWh)</b>	<b>2,899,200</b>	<b>2,808,950</b>	3.2%
Electricity Sales (Revenue TTD)	\$2,980,303,244	\$2,952,522,680	0.9%
Electricity Sales (Revenue) per Employee (TTD)	\$1,026,629	\$987,136	4.0%
Number of Customers	501,309	493,965	1.5%
<b>Customers per Employee</b>	<b>173</b>	<b>165</b>	<b>4.8%</b>

### 2.2.2 Electricity sales per employee (kWh) and Customers per employee - Trinidad and Tobago vs Regional Countries

T&TEC's electricity sales per employee (kWh) and customers per employee ratios were compared to the performance of other electric utilities within the Caribbean region, as shown in table 7. The electric utilities were selected based on data availability.<sup>17</sup> Over the period, T&TEC's electricity sales per employee ratio (2,808,950 kWh) was higher than that of several electric utilities in the Caribbean region, including those in the Cayman Islands (2,770,539 kWh), Jamaica (2,045,830 kWh) and St. Lucia (1,413,410 kWh). In terms of customers per employee, T&TEC's ratio was higher<sup>18</sup> than that of the electric utility in the Cayman Islands (127), but lower than the utilities in St. Lucia (262) and Jamaica (416).

<sup>17</sup> Comparisons were based on data for the year 2019, as data for the current period was not available during the preparation of this report. Relevant data was retrieved from the following reports: Jamaica Public Service Co. Limited 2019 Annual Report, Caribbean Utilities Co. Limited 2019 Annual Report, and Engagement 2019 Annual Report 2019.

<sup>18</sup> A higher ratio is indicative of better performance with respect to the customers per employee ratio.

**Table 7: Economic Data: Trinidad and Tobago vs Regional Countries (2019)**

Indicator	Country			
	Trinidad and Tobago	Jamaica	St. Lucia	Cayman Islands
No. of Employees	2991	1600 <sup>19</sup>	261	241
Electricity Sales (kWh)	8,401,569,265	3,273,328,000	368,900,000	667,700,000
<b>Electricity Sales per Employee (kWh)</b>	<b>2,808,950</b>	<b>2,045,830</b>	<b>1,413,410</b>	<b>2,770,539</b>
No. of Customers	493,965	665,532	68,346	30,537
<b>Customers per Employee</b>	<b>165</b>	<b>416</b>	<b>262</b>	<b>127</b>

### 2.2.3 Electricity Consumption per capita

Electricity consumption per capita refers to the total electricity sales (kWh) of a country, divided by the size of the population. This metric indicates the average electricity consumption per person within the country without adjusting for specific use, whether residential, commercial or industrial.

Table 8 shows Trinidad and Tobago's electricity consumption per capita (kWh) over the period 2018 to 2020. During the period, there was a steady but small decline in electricity consumption per capita every year.

**Table 8: Electricity Consumption Per Capita for Trinidad and Tobago (2018-2020)**

Year	Electricity Consumption Per Capita (kWh/capita) <sup>20</sup>	Change from previous year (%)
<b>2020</b>	<b>6,158</b>	<b>(0.03)</b>
2019	6,160	(1.1)
2018	6,227	(1.5)

### 2.2.4 Electricity Consumption per capita - Trinidad and Tobago vs Other Jurisdictions

Trinidad and Tobago's electricity consumption per capita was compared to countries within the Latin America and Caribbean (LAC) region, and against some non-regional countries with a GDP

<sup>19</sup> This is an approximate value, as outlined in the 2019 Annual Report of Jamaica Public Service Co. Ltd.

<sup>20</sup> Consumption per capita was calculated using electricity sales data reported by T&TEC and population mid-year estimates reported by the Central Statistical Office (CSO) of Trinidad and Tobago. <https://cso.gov.tt/subjects/population-and-vital-statistics/population/>

per capita comparable to that of Trinidad and Tobago (see table 9). The countries were selected based on data availability.<sup>21</sup>

Trinidad and Tobago's electricity consumption per capita appeared to be generally higher than several countries within the LAC region. These included Jamaica (1,100 kWh), Cuba (1,600 kWh), Dominican Republic (1,600 kWh), Panama (2,300 kWh) and Venezuela (2,400 kWh). Notably, Trinidad and Tobago's electricity consumption per capita was also higher than many non-regional countries with a comparable GDP per capita. These included Uruguay (3,500 kWh), Lithuania (4,400 kWh), and Slovak Republic (5,400 kWh). The high level of electricity consumption for industrial purposes continues to account for Trinidad and Tobago's relatively high per capita consumption, as discussed in section 2.1.4.

**Table 9: Electricity Consumption per Capita: Trinidad and Tobago vs Other Jurisdictions (2018)**

Region	Country	Electricity Consumption per Capita (kWh/capita) <sup>22</sup>	GDP Per Capita (Current US\$) <sup>23</sup>
Latin American and Caribbean (LAC)	Jamaica	1,100	5,582.3
	Cuba	1,600	8,821.8
	Dominican Republic	1,600	8,282.1
	Panama	2,300	15,731.0
	Venezuela, RB	2,400	16,054.5
	<b>Trinidad &amp; Tobago</b>	<b>6,227*</b>	<b>17,398.0</b>
Non-regional Countries with Comparable GDP per capita	Uruguay	3,500	16,190.1
	Lithuania	4,400	19,601.9
	Slovak Republic	5,400	19,266.3
	Oman	7,100	15,343.1

\*This value for electricity consumption per capita was calculated using data from T&TEC and the Central Statistical Office (CSO) of Trinidad and Tobago, as shown in table 8. The value provided by the IEA Atlas of Energy for the same period was 6,300 kWh/capita.

<sup>21</sup> Comparisons were based on data for the year 2018, as data for the current period were not available during the preparation of this report.

<sup>22</sup> Electricity consumption per capita data was retrieved on 23/04/2021 from the IEA Atlas of Energy at <http://energyatlas.iea.org/#!/tellmap/-1118783123/1>

<sup>23</sup> GDP per Capita (Current US\$) data was retrieved on 23/04/2021 from the World Bank at <https://data.worldbank.org/indicator/NY.GDP.PCAP.KD.ZG?view=chart>

## **2.3 Network Reliability**

The delivery of a reliable supply of electricity is a critical part of providing quality service to customers. An unreliable supply results in economic losses and inconveniences, and increases the likelihood of damage to customers' electrical equipment. Therefore, it is important for a utility to meet some minimum standards of reliability, which should not be impacted upon as it is incentivized to concomitantly reduce costs through the pursuit of economic and operational efficiencies. Reliability metrics may also be used to assess the condition of the network over time. An analysis of the reliability of the network should be interpreted within the context of the climatic conditions in which the network is operated by the utility, since reliability indices are situational in nature and will present different baselines depending on the many intrinsic factors affecting the system.<sup>24</sup>

The Institution of Electrical and Electronics Engineers (IEEE) published its Guide for Electric Power Distribution Reliability Indices (IEEE 1366-2012). It is used in many jurisdictions around the world to monitor and report on reliability, and is used in this report to assess the reliability of T&TEC's supply. The guide recommends the use of the following indices; (SAIFI, SAIDI, and CAIDI) to track reliability. T&TEC's performance levels for each of these indices are shown in table 10.

### **2.3.1 System Average Interruption Frequency Index**

The System Average Interruption Frequency Index (SAIFI) measures the average number of sustained interruptions per customer. During 2020, SAIFI was lowest in both February and March (0.26 interruptions per customer on average per month) and highest in October (0.78 interruptions per customer per month). Overall, the annual value of SAIFI was 5.01 interruptions per customer, which was 4.4% higher than in 2019 (4.80 interruptions per customer). This increase represents a weakening in SAIFI, and implies that a T&TEC customer experienced approximately five interruptions in electricity supply per year, compared to one interruption per customer of selected North American Utilities. When compared to electric utilities within the Caribbean region, the

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<sup>24</sup> Evaluation of Data Submitted in APPA's 2013 Distribution System Reliability & Operations Survey  
[http://www.publicpower.org/files/PDFs/2013DSReliabilityAndOperationsReport\\_FINAL.pdf](http://www.publicpower.org/files/PDFs/2013DSReliabilityAndOperationsReport_FINAL.pdf)

annual value of SAIFI was better than those in Jamaica (10.71), Dominican Republic (6.90) and Grenada (6.61), but worse than those in St. Lucia (0.34) and Dominica (0.29).<sup>25</sup>

### **2.3.2 System Average Interruption Duration Index**

The System Average Interruption Duration Index (SAIDI) measures the average outage duration per customer. During 2020, SAIDI was lowest in both February and March with outages each lasting 24.20 minutes, and highest in October with 76.20 minutes. Overall, the annual value of SAIDI was 483 minutes in 2020, which was 20 minutes more than in 2019. This increase represents a weakening in SAIDI, and suggests that T&TEC's outage duration was about eight times longer per customer than that of the North American Utilities (58.49 minutes). When compared to electric utilities within the Caribbean region, the annual value of SAIDI was better than Jamaica (1,628), but worse than those in the Dominican Republic (398), Grenada (382), Dominica (35) and St. Lucia (11).<sup>26</sup>

### **2.3.3 Customer Average Interruption Duration Index**

The Customer Average Interruption Duration Index (CAIDI) is a ratio of SAIDI to SAIFI. It is a measure of the average outage duration that an individual customer would experience. It can also be interpreted as the average restoration time. During 2020, CAIDI was lowest in both February and March with an average restoration time of 79.80 minutes, and highest in June with 151.20 minutes. Overall, the annual value of CAIDI was 96.41 minutes in 2020, compared to 97 minutes in 2019. T&TEC slightly outperformed the average CAIDI for the selected North American Utilities (96.47 minutes). When compared to electric utilities within the Caribbean region, the annual value of CAIDI was better than those in Jamaica (152.0) and Dominica (120.69), but worse than those St. Lucia (32.35), Dominican Republic (57.68) and Grenada (57.79).<sup>27</sup>

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<sup>25</sup> Comparisons were based on data for the year 2019, as data for the current period was not available during the preparation of this report. The relevant data was retrieved on 26/04/2021 from the World Bank - GovData360 (SAIFI) at <https://govdata360.worldbank.org/>

<sup>26</sup> Comparisons were based on data for the year 2019, as data for the current period was not available during the preparation of this report. Relevant data was retrieved on 26/04/2021 from the World Bank - GovData360 (SAIDI) at <https://govdata360.worldbank.org/>

<sup>27</sup> CAIDI calculations were based on the respective SAIFI and SAIDI values retrieved from the World Bank – GovData360 at <https://govdata360.worldbank.org/>

**Table 10: SAIFI, SAIDI & CAIDI (2020)**

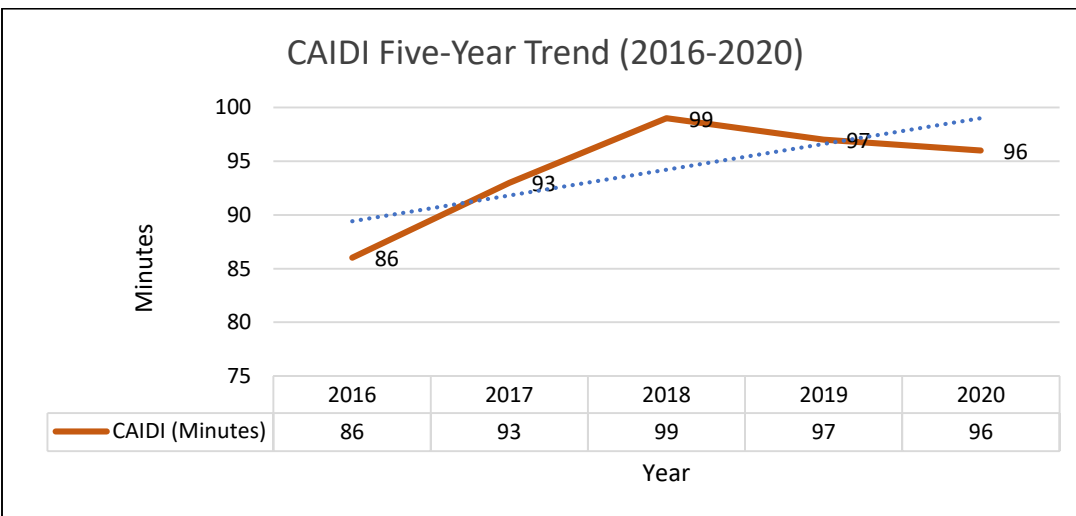
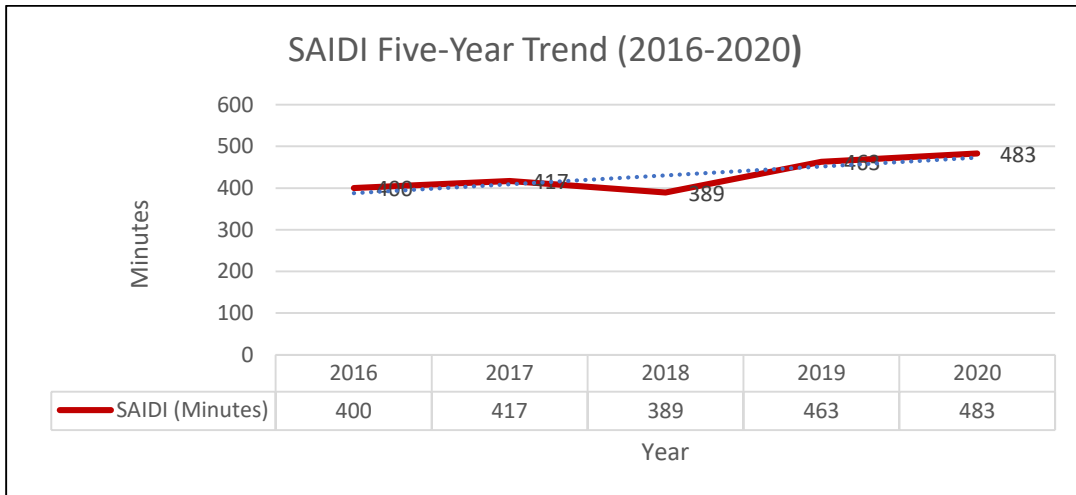
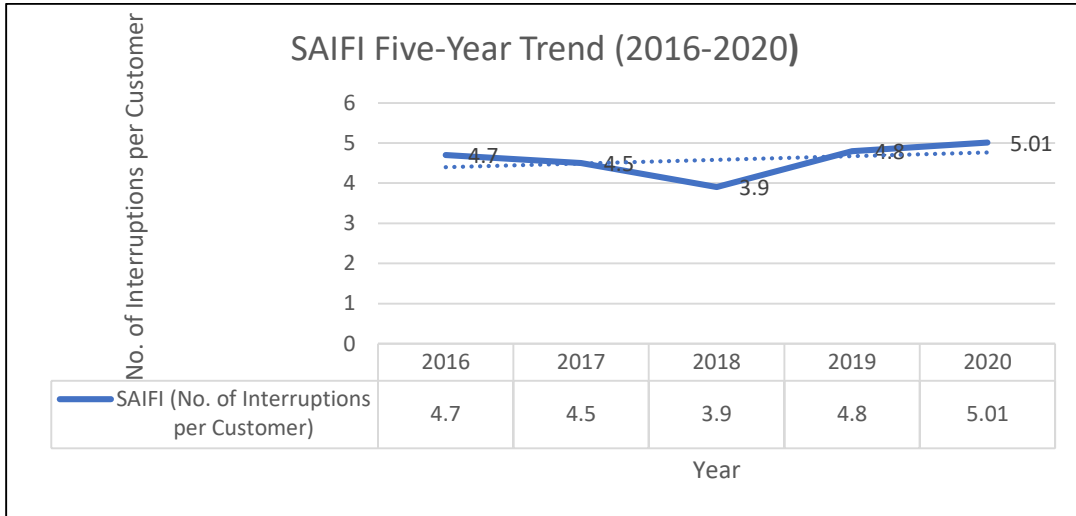
Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	NAU*
SAIFI (No. of interruptions per customer)	0.35	0.26	0.26	0.34	0.33	0.46	0.46	0.54	0.49	0.78	0.40	0.34	<b>5.01</b>	1.11
SAIDI (minutes)	28.80	20.40	20.40	32.40	29.40	69.00	46.20	49.80	45.00	76.20	35.40	30.00	<b>483.00</b>	58.49
CAIDI (minutes)	82.20	79.80	79.80	95.40	90.60	151.20	100.20	92.40	90.60	97.20	88.20	88.80	<b>96.41</b>	96.47

Mean values for the North American Utilities (NAU) reported by the American Public Power Association APPA, according to IEEE Standard 1366-2012

### 2.3.4 Network Reliability Trends (2016-2020)

A graphical representation of the network reliability indicators (SAIFI, SAIDI and CAIDI) for the five-year period 2016-2020 is presented in figure 4. It shows that each indicator weakened over the past five years. Specifically, SAIFI increased from 4.7 interruptions per customer in 2016 to 5.01 interruptions per customer in 2020; SAIDI increased from 400 minutes in 2016 to 483 minutes in 2020; and CAIDI increased from 86 minutes in 2016 to 96 minutes in 2020.

**Figure 4: Network Reliability: Five-Year Trends (2016-2020)**





### 2.3.4 Number of Transmission Trips & Interruptions Affecting Customers

There were 37 transmission trips and interruptions affecting customers in 2020, as shown in table 11. This represented a 17.8% decline from 2019, in which there were 45 trips and interruptions. The majority of the trips and interruptions occurred on the 33kV circuit (24), followed by the 66kV circuit (13). However, there were no trips and interruptions on the 132kV circuit.

**Table 11: Transmission Trips & Interruptions Affecting Customers (2020)**

Month	Transmission Circuit Trip			Number of Interruptions Restored (<3hrs)			Number of Interruptions Restored (<5hrs)		
	33kV	66k V	132kV	33kV	66kV	132kV	33kV	66k V	132kV
Jan	0	0	0	0	0	0	0	0	0
Feb	1	0	0	1	0	0	0	0	0
Mar	3	2	0	3	2	0	0	0	0
Apr	0	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0	0
Jun	1	1	0	1	1	0	0	0	0
Jul	6	2	0	6	2	0	0	0	0
Aug	1	0	0	1	0	0	0	0	0
Sep	6	5	0	4	5	0	1	0	0
Oct	3	1	0	3	1	0	0	0	0
Nov	2	1	0	2	1	0	0	0	0
Dec	1	1	0	1	1	0	0	0	0
<b>Total</b>	<b>24</b>	<b>13</b>	<b>0</b>	<b>22</b>	<b>13</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>

T&TEC restored 100% of the trips and interruptions on the 66kV circuit within three (3) hours, as shown in table 12. In the case of the 33kV circuit, T&TEC restored 91.7% of the trips and interruptions within three hours, while an additional 4.1% was restored within five hours. Overall, T&TEC restored 97.3% of all the transmission trips and interruptions on the network within five hours, compared to 93.3% in 2019. Therefore, indicating a small improvement in T&TEC's performance over the period.

**Table 12: Summary of Transmission Trips & Interruptions Affecting Customers (2020)**

	No. of Trips and Interruptions on Network			
	33kV	66kV	132kV	Total
Total	24	13	0	37
Restoration < 3 hrs	22	13	0	35
Restoration < 5 hrs <sup>28</sup>	23	13	0	36
% < 3 hrs	91.7%	100%	N/A	94.6%
% < 5hrs <sup>29</sup>	95.8%	100%	N/A	97.3%

## 2.4 Customer Responsiveness and Service

This section examines T&TEC’s response to customer complaints, focusing on those aspects of performance that have been identified as most important to customers. One signal that a utility is improving its service to customers is an overall reduction in the number of complaints filed by customers. In assessing T&TEC’s responsiveness and service to customers, the RIC examined the number of complaints received, the number of complaints resolved and the resolutions rate over the period.

### 2.4.1 Complaints Received and Resolved

In 2020, T&TEC received 41,175 customer complaints, representing a 21.3% decline from 2019 as shown in table 13. This decline was an indication of the impact of COVID-19 restrictions on T&TEC’s daily operations, including the suspension of certain non-essential activities such as the customer complaints facility, and the simplification of its online platform which allowed customers to easily pay and access bill balances. Poles and other<sup>30</sup> complaints (31,818) accounted for the largest share of customer complaints in 2020. This was followed by billing queries (8,838), damaged appliances (265) and high/low voltage complaints (254), respectively. T&TEC received the highest number of customer complaints during the 1st quarter (11,998), and the lowest during the 2nd quarter (8,396).

<sup>28</sup> This value includes those transmission trips and interruptions restored in less than 3 hours (< 3 hrs).

<sup>29</sup> This percentage includes the percentage of transmission trips and interruptions restored in less than 3 hours, i.e. % < 3 hrs.

<sup>30</sup> ‘Other’ complaints include but are not limited to defective streetlights, power outages, delays in the delivery of service and line relocation and removals.

**Table 13: Complaints Received by Type (2019 - 2020)**

Type of Complaint	No. of Complaints Received				
	Jan-Mar (Q1)	Apr-Jun (Q2)	Jul-Sep (Q3)	Oct-Dec (Q4)	Total
Billing Query	4,504	1,152	2,704	478	8,838
Damaged Appliances	28	34	59	144	265
High/Low Voltage	78	33	37	106	254
Poles/Other	7,388	7,177	8,564	8689	31,818
<b>Total (2020)</b>	<b>11,998</b>	<b>8,396</b>	<b>11,364</b>	<b>9,417</b>	<b>41,175</b>
Total (2019)	14,359	13,490	11,707	12,740	52,296

In 2020, T&TEC resolved 38,469 customer complaints, compared to 49,805 in 2019 (see table 14). T&TEC resolved the highest number of complaints during the 3<sup>rd</sup> quarter (11,277), and the lowest during the 2<sup>nd</sup> quarter (8,340).

**Table 14: Complaints Resolved by Type (2019-2020)**

Type of Complaint	No. of Complaints Resolved				
	Jan-Mar (Q1)	Apr-Jun (Q2)	Jul-Sep (Q3)	Oct-Dec (Q4)	Total
Billing Query	4,505	1,152	2,704	459	8,820
Damaged Appliances	2	0	11	139	152
High/Low Voltage	77	31	36	106	250
Poles/Other	5,336	7,157	8,526	8228	29,247
<b>Total (2020)</b>	<b>9,920</b>	<b>8,340</b>	<b>11,277</b>	<b>8,932</b>	<b>38,469</b>
Total (2019)	13,578	13,254	11,079	11,894	49,805

#### 2.4.2 Complaints Resolution Rate

In 2020, there was a decline in T&TEC's complaints resolution rates across all the complaints categories, compared to 2019. These include billing queries (99.8%), high/low voltage complaints (98.4%), poles and other related complaints (91.9%) and damaged appliances (57.4%), as shown in table 15. Consequently, T&TEC's overall complaints resolution rate fell slightly from 95.2% to 93.4% in 2020.

**Table 15: Complaints Resolution Rate (2019 - 2020)**

Type of Complaint	Total Number of Complaints					
	2020			2019		
	Received	Resolved	Resolution Rate	Received	Resolved	Resolution Rate
Billing Query	8,838	8,820	<b>99.8%</b>	15,732	15,732	100%
Damaged Appliances	265	152	<b>57.4%</b>	618	394	63.8%
High/Low Voltage	254	250	<b>98.4%</b>	586	586	100%
Poles/Other	31,818	29,247	<b>91.9%</b>	35,360	33,093	93.6%
Total	41,175	38,469	<b>93.4%</b>	52,296	49,805	95.2%

### 2.4.3 Response to Written Complaints

Customers may lodge complaints with T&TEC using various media, including via telephone or in writing. In this regard, the timeliness of T&TEC’s response to a customer complaint is an important indicator of its service quality. T&TEC’s response to written customer complaints over the period 2019-2020 is shown in table 16. T&TEC received 151 written customer complaints in 2020. This represented a 32.6% decline from 2019, in which 224 written complaints were received. Of the 151 written complaints received, T&TEC responded to all but 5 (i.e. 3.3%) within two weeks.

**Table 16: Response to Written complaints (2019-2020)**

Month/Year	No. of written complaints received	No. of written complaints (received in the month) not responded to within 2 weeks	No. of written complaints (received in previous months) not responded to within 2 weeks	% Complaints with Response > 2 weeks
Jan	10	0	0	0%
Feb	14	0	0	0%
Mar	9	0	0	0%
Apr	2	0	0	0%
May	3	0	0	0%
Jun	9	4	0	2.6%
Jul	20	0	0	0%
Aug	10	0	0	0%
Sep	26	0	0	0%
Oct	15	0	0	0%
Nov	11	0	0	0%
Dec	22	1	0	0.7%
<b>Total 2020</b>	<b>151</b>	<b>5</b>	<b>0</b>	<b>3.3%</b>
<b>Total 2019</b>	<b>224</b>	<b>0</b>	<b>0</b>	<b>0%</b>

### 2.5 Specific Directives

T&TEC is required to carry out specific directives related to its operations, and meet certain requirements as stipulated by the RIC in the Final Determination (2006). This section focuses on two (2) of these specific directives – repair and maintenance of pole-mounted transformers, and repair/replacement of defective streetlights.

### 2.5.1 Repair and Maintenance of Pole-mounted Distribution Transformers

T&TEC is required to repair and maintain pole-mounted distribution transformers at a rate of at least 20% per annum, as outlined in the Final Determination (2006). There were 40,629 pole-mounted transformers in service at the end of 2020 as shown in table 17, compared to 39,779 in 2019. The annual percentage of pole-mounted distribution transformers inspected/serviced increased from 53.1% in 2019 to 68.8% in 2020. Thus, T&TEC met the stipulated 20% minimum requirement.

**Table 17: Repairs & Maintenance to Pole-Mounted Transformers (2020)**

Indicator	No. of Pole-Mounted Transformers				
	Jan-Mar (Q1)	Apr-Jun (Q2)	Jul-Sep (Q3)	Oct-Dec (Q4)	Total
No. of Pole Mounted Distribution Transformers	38,609	38,718	40,473	40,629	40,629
No. of Transformers Inspected	7,605	5,312	9,122	3,377	25,416
No. of Transformers Serviced	503	815	611	618	2,547
% Transformers Inspected/Serviced	<b>21.0%</b>	<b>15.8%</b>	<b>24.0%</b>	<b>9.8%</b>	<b>68.8%</b>

### 2.5.2 Street Lighting Repair

T&TEC is responsible for monitoring the operation of public lighting. It is required to repair reported street lighting failures within seven (7) days. T&TEC is also required to monitor highway lighting and repair non-working lights within 14 days of discovery. The number of street lighting repairs undertaken by T&TEC in 2020 is presented in table 18.

T&TEC received 24,347 reports from customers and members of the public for repairs to existing streetlights in 2020. Of these, T&TEC completed 5,847 repairs (or 24%) within seven days. Apart from this, T&TEC completed 7,392 street lighting repairs in response to failures detected by its crews and other staff during the period. In total, T&TEC completed 30,981 street lighting repairs in 2020, with the highest amount completed during July-September (8,935).

**Table 18: Street Lighting Repairs (2020) \*\***

Indicator	2020				Total
	Jan-Mar (Q1)	Apr-Jun (Q2)	Jul-Sep (Q3)	Oct-Dec (Q4)	
No. of reports received (note 1)	6,304	5,326	6,500	6,217	<b>24,347</b>
No. of repairs completed within 7 days (note 2)	1,070	989	2,560	1,228	<b>5,847</b>
No. of repairs without a report (note 3)	1,399	1,831	2,005	2,157	<b>7,392</b>
No. of repairs completed (note 4)	5,305	8,766	8,935	7,975	<b>30,981</b>

Notes:

- 1 Reports received from customers and/or members of the public for repairs/requests to existing streetlights
  - 2 Work arising from reports received as in Note 1 and completed in 7 days or less of the date received.
  - 3 Work arising from sources other than customer reports, e.g. inspections by staff and observation by crews.
  - 4 Total work completed within the month, i.e. repairs arising from both customer report as well as inspections and observation by crews.
- \*\* The columns in table 18 are not meant to be totalled.

A comparison of T&TEC's performance with respect to street lighting repairs for the years 2019 and 2020 is shown in table 19. The number of street lighting failure reports received by T&TEC increased by 0.7% over the period. The 7-day repair rate for street-lighting failures increased from 22.2% in 2019 to 24% in 2020, indicating that there was some improvement in T&TEC's performance over the period. The number of unreported failures of street lights detected and repaired by T&TEC decreased by 29.5%, moving from 10,491 in 2019 to 7,392 in 2020

**Table 19: Summary of Street Light Repairs (2019 - 2020)**

Indicator	Year		Percentage Change (%)
	2020	2019	
No. of Reports Received	<b>24,347</b>	24,185	0.7%
No. of Repairs Completed within 7 days	<b>5,847</b>	5,375	8.8%
7-day Repair Rate for reported failures	<b>24%</b>	22.2%	8.1%
No. of Repairs without a report	<b>7,392</b>	10,491	(29.5%)
Total No. of Repairs Completed (includes carryover from previous year)	<b>30,981</b>	34,957	(11.4%)

## 2.6 Financial Performance and Efficiency

One of the primary goals of economic regulation is to ensure that the utility operates in a way that ensures financial viability and sustainability, while providing an acceptable quality of service to customers at a reasonable price. The RIC has a duty to ensure that T&TEC can finance its efficient expenditure. A selected set of financial ratios is shown in table 20 and these are used to assess T&TEC's performance from the perspective of debt financing, liquidity, and efficiency.<sup>31 32</sup>

**Table 20: Select Financial Ratios of T&TEC's Performance (2019 – 2020)**

Indicator	Year		Target
	2020	2019	
<b>Debt Financing</b>			
Gearing (%)	(1.70%)	(1.95%)	
Funds Flow Interest Cover	(1.65)	(0.77)	Greater than 3
Cash Interest Cover	(5.36)	1.79	Greater than 1
Debt Pay Back Period (Years)	(9.42)	(13.50)	Between 5 to 7
<b>Liquidity</b>			
Collection Rate (%)	47%	55%	
Revenue Billed/Operating Cost	0.67	0.74	Greater than 2
Revenue Collected/Operating cost	0.64	0.76	Greater than 1
Internal Financing (%)	(607)%	(401)%	Greater than 40%
<b>Efficiency</b>			
Operating Cost per unit (\$/kWh)	0.40	0.39	

<sup>31</sup> In previous years, profitability ratios that incorporated the Regulatory Asset Base (RAB) were also used in the analysis. These have been discontinued, given the passage of time since the RAB was set in 2006 and the impact of depreciation. The calculation of these ratios will resume once the RAB is re-set for regulatory purposes.

<sup>32</sup> The accounting standard IFRS 16- Leases, which affects how lease agreements are treated in financial statements, was implemented in 2019. Previously, leases were treated as either finance or operating leases. Finance leases were recognised as assets on the lessees' statement of financial position (balance sheet) and operating leases were not. This distinction has been removed and the vast majority of leases are in essence to be classified as finance leases. This has implications for depreciation and the asset base, and consequently affects the calculation of many common financial ratios and performance metrics, such as gearing, current ratio, asset turnover, interest cover, operating profit, net income, and operating cash flows etc. For the purposes of this report and to ensure comparability with previous reports, the effects of the this IFRS were removed and the figures were "normalised" to calculate the relevant ratios.

### **2.6.1 Debt Financing**

T&TEC's overall ability to meet its financial obligations did not improve in 2020, and this is demonstrated by the level of its financial metrics. Gearing moved from negative 1.95% in 2019 to negative 1.70 % in the year 2020, a very marginal improvement. In 2020, funds flow interest cover continued to be well below the optimal range at negative 1.65. Cash interest coverage deteriorated in 2020, and moved from within the optimum range to negative 5.36. Funds from operations (FFO)<sup>33</sup> were insufficient to match the increase in operating expenditure, resulting not only in an operating loss but in the debt payback period remaining outside the acceptable range.

### **2.6.2 Liquidity**

T&TEC's liquidity position worsened in 2020. The collection rate decreased from 55% in 2019 to 47% in 2020, suggesting that T&TEC's ability to collect its receivables had deteriorated. T&TEC's ability to meet its full operating costs from revenue also declined in 2020. This is reflected in the fall of the revenue billed/operating costs ratio to 0.67 in 2020 from 0.74 in 2019. This trend is similarly reflected in the revenue collected/operating cost ratio which also fell from 0.76 in 2019 to 0.64 in 2020. The internal financing ratio further worsened from negative 401% to negative 607% in 2020, as there was an increase in operating expenditure due mainly to an increase in the interest and finance costs coupled with a decrease in Net Capex.

### **2.6.3 Efficiency<sup>34</sup>**

The operating cost per kWh is being utilised in this analysis as it is suitable for measuring the efficiency of operations in a state owned public utility. The operating cost per kWh increased by 3%, between 2019 and 2020. This ratio has consistently stood between \$0.38/kWh-\$0.40/kWh for the last three (3) years and suggests that some efficiency measures have been implemented.

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<sup>33</sup> Funds from operations is broadly the equivalent of net cash flow from operation less non recurrent sources of revenue such as capital contributions, proceeds from disposals and other investment activity.

<sup>34</sup> The Return on the Regulatory Asset Base (RAB) metric has been removed from the list of financial metrics included in this Report. It is dependent, as the name suggests, on the RAB, which was established in 2006, at the time of the last T&TEC Price Review; given the passage of time there is need to reassess same for regulatory purposes. The RAB was being rolled forward (minus annual depreciation, plus new capital expenditure) for the purpose of this calculation and the figure that is being yielded is not considered to be a reasonable reflection of the RAB.



## **SECTION 3.0 CONCLUSION AND RECOMMENDATIONS**

### **3.1 Conclusion**

Overall, T&TEC improved its performance in some key areas in 2020. These include: total system losses (9.05%), electricity sales per employee ratio (2,899,200 kWh), customer per employee ratio (173), transmission trips and interruptions on the network (37), restoration rate for trips and interruptions (97.3%), customer complaints received (41,175), 7-day repair rate for reported street lighting failures (24%), and annual percentage of pole-mounted distribution transformers inspected/serviced (68.8%).

Notwithstanding the above, T&TEC's performance weakened in certain operational areas. These include the network reliability indicators SAIFI (5.01 interruptions per customer), SAIDI (483 minutes), street lighting failure reports received (24,347), customer complaints resolution rate (93.4%), funds flow interest cover (1.65%), cash interest cover (5.36), collection rate (47%), revenue collected/operating cost (0.64) and internal financing (607%).

When the findings of this Report are combined with its predecessor, there seems to be a strong correlation between the deterioration of T&TEC's performance for certain indicators, e.g. financial performance and efficiency, and the stagnation of electricity rates since the last price review. T&TEC remained in a sizable deficit position at the end of 2020. Therefore, with the initiation of the second price review for T&TEC, the RIC seeks to ensure sustainability of the service provider.

### **3.2 Recommendations**

In an effort to promote T&TEC's sustainability, the RIC proposes the following actions to be undertaken by T&TEC to improve future operations and performance. T&TEC should:

- develop suitable strategies to reduce system losses;
- continue to employ appropriate strategies to minimise the number of transmission trips and interruptions on the network;
- review its strategies for reducing the frequency and duration of power outages. This would improve the SAIDI and SAIFI indicators, and may reduce the number of complaints related to damaged appliances;

- continue to employ suitable strategies to reduce the quantum of customer complaints, and enhance its complaints resolution rate; and
- strengthen its collection program to decrease receivables and improve cash flow.

## APPENDIX: PERFORMANCE INDICATORS FOR T&TEC

Item	Category	Indicator	Definition	Units	Reporting Period
1.0	Aggregate Data				
1.1		Number of electricity customers by class and area	T&TEC's customer data		Yearly
1.2		KWh sales by area	T&TEC's customer data		Semi Annually
1.3		KWh purchased	The basic unit of electric demand, equal to 1,000 watt-hours.	KWh	Monthly
1.4		Total System Losses	Difference between MWh purchased and sold  $\text{Total System Losses} = 1 - \left\{ \frac{\text{Energy Units Billed (kWh)}}{\text{Energy Units Purchased/Generated}} \right\}$	kWh	Quarterly
1.5		Electricity coverage (i.e. Access to electricity)	$\frac{[\text{No. of customers (T\&TEC stats)}]}{[\text{No. of households in T\&T}]}$		Quarterly & Yearly
2.0	<b>Financial</b>				
2.1		Gearing	$\frac{[\text{Interest bearing debt}]}{[\text{Interest bearing debt} + \text{equity}]}$		Yearly
2.2		Funds From Operations (\$)	Operating Revenue – Operating Expenses	\$	Yearly
2.3		Funds Flow Interest Cover (Times)	$\frac{(\text{FFO} + \text{Interest})}{\text{Interest}}$		Yearly
2.4		Cash Interest Cover (Times)	$\frac{\text{Opening Cash Flow}}{\text{Interest Expense}}$		Yearly
2.5		Debt Pay Back Period (Years)	$\frac{\text{Net Debt}}{\text{FFO}}$	Years	Yearly
2.6		Debt as a proportion of RAB (%)	$\frac{\text{Net Debt}}{\text{RAB}}$		
2.7		Collection Rate	$\frac{\text{Operating Revenue} - \text{Receivables}}{\text{Operating Revenue}} \times 100 \%$	%	Yearly
2.8		Revenue Billed/Operating Cost	$\frac{\text{Operating Revenue Billed}}{\text{Operating Cost}}$		Yearly

Item	Category	Indicator	Definition	Units	Reporting Period
2.9		Revenue Collected/Operating cost	Revenue Collected Operating Cost		Yearly
2.10		Internal Financing (%)	$\frac{\text{FFO} - \text{Dividends}}{\text{Net CAPEX}} \times 100\%$	%	Yearly
2.11		Return on RAB (%)	$\frac{\text{Net operating income}}{\text{RAB}} \times 100\%$	%	Yearly
2.12		Operating cost per unit	$\frac{\text{Total Operating costs}}{\text{Total no. of kWh sold}}$	\$	Yearly
3.0	<b>Network Reliability</b>				
3.1		System average interruption frequency index (SAIFI) (Average number of sustained interruptions per customer)	Total number of reported customer interruptions greater than 1 minute duration / total number of customers served	Interruptions per year	Yearly
3.2		System average interruption duration index (SAIDI) (Average minutes off supply per customer)	Sum of each outage duration in minutes times the number of customers / total number of customers served	Minutes	Yearly
3.3		Customer average interruption duration index (CAIDI) (Average interruption duration)	$\frac{[\text{SAIDI}]}{[\text{SAIFI}]}$	Minutes	Yearly
3.4		Number of transmission and distribution circuit trip outs by voltage level			Yearly
3.5		Interruptions restored within 3 hours and 5 hours			Yearly
4.0	<b>Affordability and other Economic Data</b>				

Item	Category	Indicator	Definition	Units	Reporting Period
4.1		Sales per employee (KWh)	$\frac{[\text{Total KWh sales}]}{[\text{Number of employees}]}$	(KWh)	Yearly
4.2		Sales per employee (\$)	$\frac{[\text{Total revenue form sales}]}{[\text{Number of employees}]}$	(\$)	Yearly
4.3		Customers per employee	$\frac{[\text{Total no of customers}]}{[\text{Total number of employees}]}$	Number	Yearly
4.4		Consumption per capita (kWh)	$\frac{[\text{Total Kwh sales}]}{[\text{Total population}]}$	KWh	Yearly