INFORMATION DOCUMENT

REGULATED INDUSTRIES COMMISSION

REVIEW OF THE STATE OF THE TRINIDAD & TOBAGO ELECTRICITY COMMISSION 1995 - 2003

Classification: Information Document

Distribution: Stakeholders / Public

Reference No.: ER/003/05

Date: May 2005

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1. INTRODUCTION

1.1 Background

The RIC Act, No. 26 of 1998, established the Regulated Industries Commission (RIC) as a statutory body. Section 6 of the RIC Act empowers the RIC, among other things to:

- Establish the principles and methodologies by which service providers determine rates for services;
- Carry out periodic reviews of the rating regimes of service providers; and
- Carry out studies of efficiency and economy of operation and performance by service providers and publish the results thereof.

These obligations encompass core aspects of the organization's operations, including customer service and system performance.

Additionally, the Act specifically mandates the RIC to consult with service providers, representatives of consumer interests groups and other stakeholders. It is in keeping with these objectives and its responsibilities that this document, 'Review of the State of the Trinidad and Tobago Electricity Commission (T&TEC) 1995 - 2002' is being published for the information of all stakeholders as well as the public.

1.2 Objective of The Document

The purpose of this document is to review the operational and financial state of T&TEC, as well as to benchmark T&TEC's performance against other utilities for the purpose of comparison.

1.3 Sources

Most of the information for this review has been sourced from documentation supplied by T&TEC. The RIC has used data from its files as a supplementary source of information.

1.4 Structure of The Document

The document is divided into six sections; first a description of the electricity sector is provided outlining T&TEC's operations in terms of generation, transmission and distribution. Next, the Electricity Commission's operational performance is examined, and productivity trends are explored. This is followed by an overview of T&TEC's financial performance as well as comparisons of the Commission's tariffs with other countries in the Caribbean and Latin America. We end with some general conclusions.

2. ELECTRICITY SECTOR STRUCTURE

The electricity sector is comprised of two generators, the Power Generation Company of Trinidad and Tobago (PowerGen) and Trinity Power Management Limited (formerly InnCogen Ltd.), as well as one transmission and distribution utility, T&TEC, which served 346,028 customers in 2003.

2.1 Generation

Between 1961 and 1994, the electricity sector in Trinidad and Tobago was operated by T&TEC; a state owned vertically integrated monopoly. In December 1994 PowerGen was established as a result of the divestment of T&TEC's generation assets. The main shareholders at the time of establishment of PowerGen were T&TEC - 51%, Southern Electric International - 39%, and Amoco - 10%. Since that time the Mirant Corporation has purchased the shares of Southern Electric.

PowerGen's current total installed capacity is 1178 Megawatts (MW) derived from units at Port of Spain (308 MW), Point Lisas (634 MW) and Penal (236 MW). PowerGen sells bulk power to T&TEC under a 15-year Power Purchase Agreement (PPA), its commitment being, the provision of 819MW of capacity and 100MW of spinning reserve at a specified heat rate[1]. The PPA specifies the prices to be paid by T&TEC. PowerGen bills T&TEC in US currency and as a result, the prices are adjusted annually by the rate of inflation in the United States (i.e. using the US Consumer Price Index). This PPA will expire in December 2009.

In 1999 T&TEC entered into a 30-year PPA with InnCogen Ltd. (now Trinity Power Management Limited) to supply 195 MW. Trinity Power's total installed capacity is 225MW.

There is a specific condition in each PPA stipulating that T&TEC procures natural gas for the generation companies. T&TEC has a contract with the National Gas Company (NGC) for the purchase of gas, the price of which increases annually by 4%.

T&TEC also has the responsibility for load forecasting and all generation planning. It could, however, enter into a licence agreement with an approved generator for non-exclusive rights to supply electricity. T&TEC supplies power to Tobago via a submarine cable and maintains an eleven Megawatt diesel station as a back-up supply.

2.2 Transmission & Distribution

T&TEC as a statutory body has an exclusive right to transmit and distribute electricity throughout Trinidad and Tobago. It is responsible for operating and maintaining the Transmission and Sub Transmission Systems, which include voltages of 132,000V, 66,000V and 33,000V. The Company also has the responsibility for meeting the load from available generation and maintaining system frequency. Additionally, T&TEC has the responsibility for operating the distribution system, which includes voltages of

[1] The specified heat rate is between 13,300 kilojoules per kilowatt-hour and 14,700 kilojoules per kilowatt-hour.

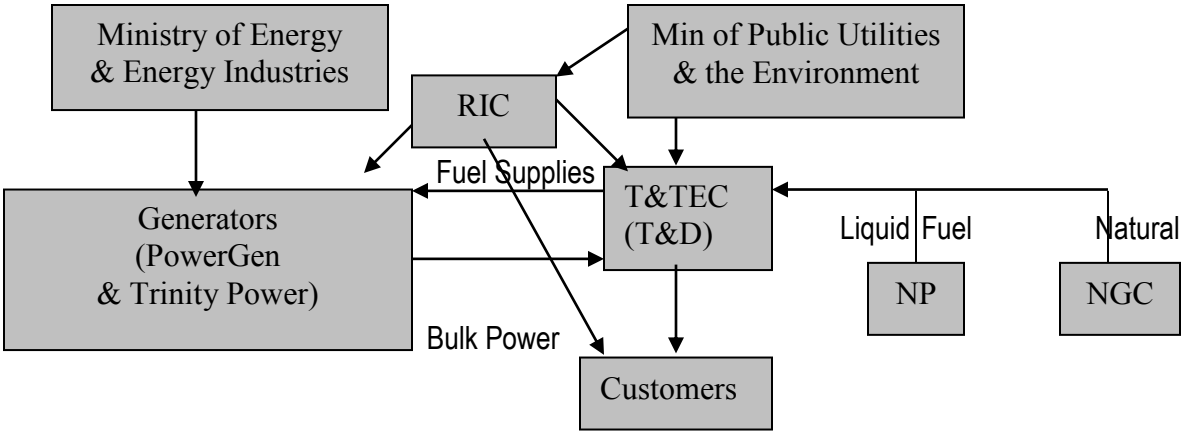
12,000V, 115V, 230V, and 400V. T&TEC is also responsible for metering, billing and collection. (Appendix I shows T&TEC's Organisational Structure).

2.3 Institutional Arrangements

There are other organisations that play a significant role in the operations of the electricity sector. The Ministry of Public Utilities and the Environment is the line Ministry for T&TEC and sets sector policy. Under the RIC Act, No. 26 of 1998, the Minister is responsible for granting licenses. The T&TEC Act, Chapter 54:70, also specifies a reporting and oversight role for the line Ministry. The Ministry of Energy and Energy Industries is responsible for the generators. This Ministry also has the responsibility for the policy direction of the National Gas Company. The current structure and institutional relationships are shown in **Figure 1** below.

Figure 1

CRITICAL LINKAGES IN THE ELECTRICITY SECTOR [2]



3. OPERATIONAL PERFORMANCE

The performance of T&TEC in its main areas of operations is reviewed in this section. During the period 1995 to 2001, the economic efficiency and reliability of electricity service generally improved.

[2] **Figure 1** does not capture all the intricacies of the sector but summarises the main inter-relationships among the key players.

3.1 Reliability of Supply

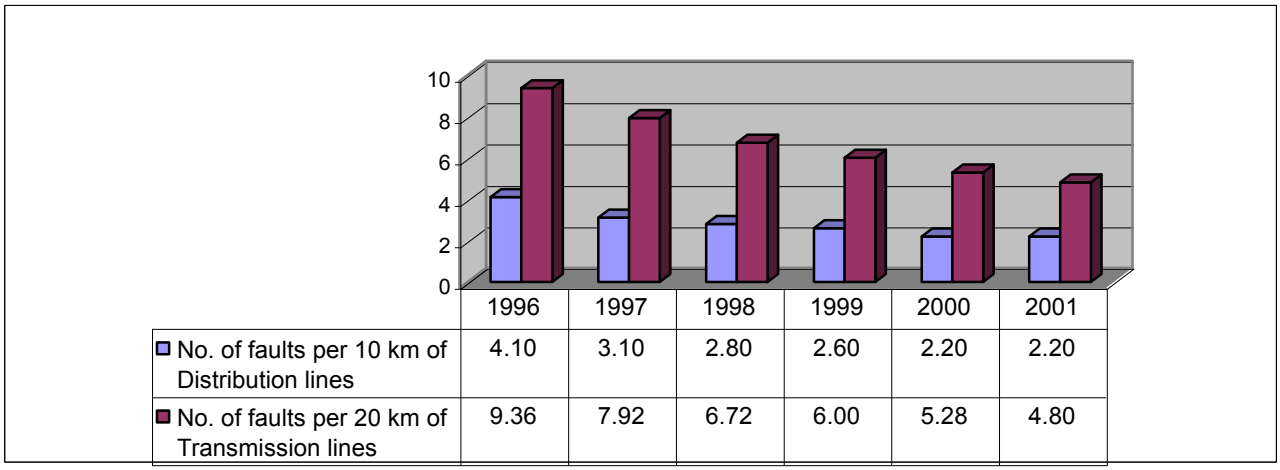
Customers have frequently reported problems relating to reliability of supply and voltage fluctuations. However, over the period 1996 to 2001 the reliability of supply has consistently improved. This can be illustrated by the following statistics:

- **Circuit Interruptions (outages)**

  In **Figure 2** there is evidence of a consistent downward trend over the six years. However, in **Figure 3** there tended to be wider fluctuation, but overall improvement.

Figure 2

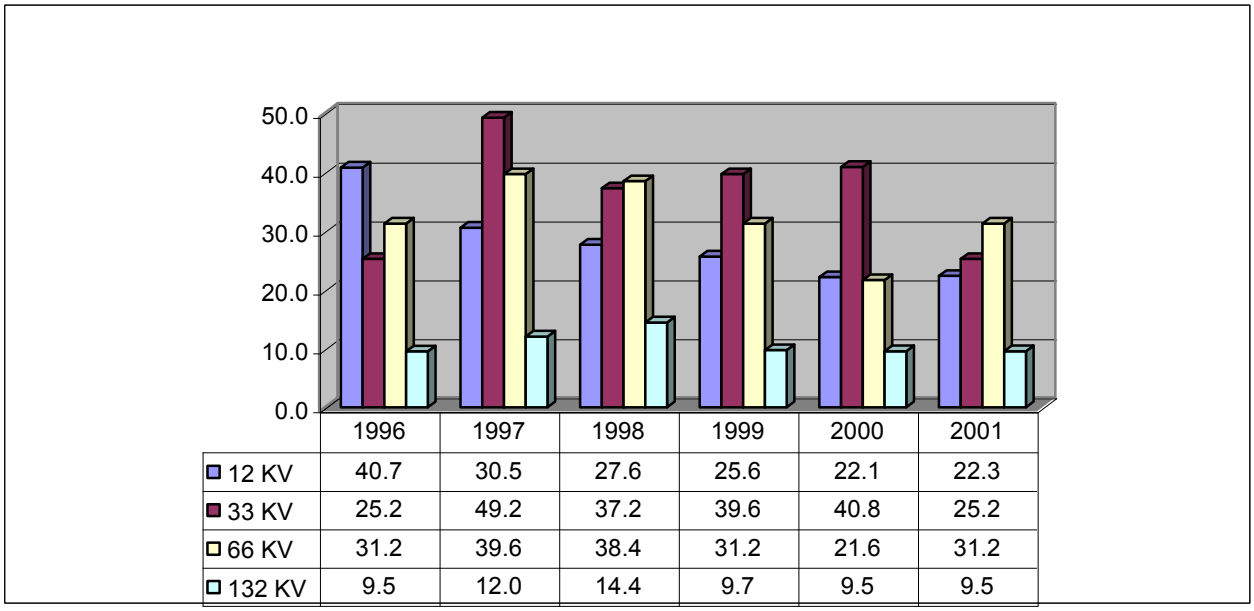
NUMBER OF TRANSMISSION & DISTRIBUTION CIRCUIT INTERUPTIONS / OUTAGES



	1996	1997	1998	1999	2000	2001
No. of faults per 10 km of Distribution lines	4.10	3.10	2.80	2.60	2.20	2.20
No. of faults per 20 km of Transmission lines	9.36	7.92	6.72	6.00	5.28	4.80

Figure 3

NUMBER OF TRANSMISSION & DISTRIBUTION CIRCUIT INTERUPTIONS / OUTAGES PER 100 KM CIRCUIT



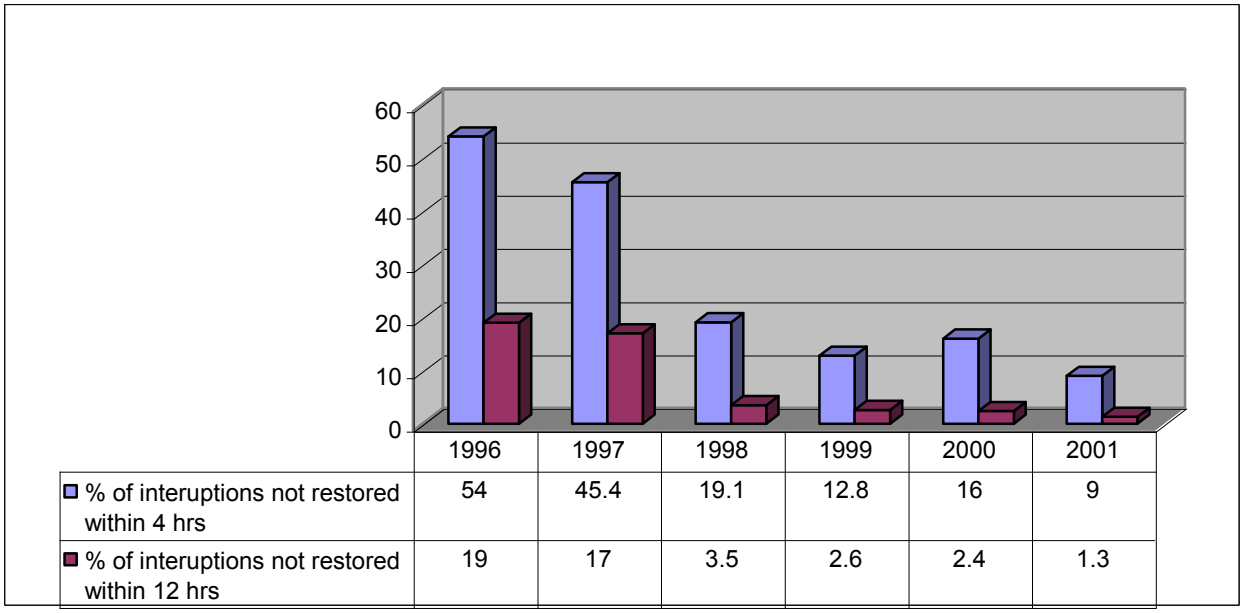
	1996	1997	1998	1999	2000	2001
12 KV	40.7	30.5	27.6	25.6	22.1	22.3
33 KV	25.2	49.2	37.2	39.6	40.8	25.2
66 KV	31.2	39.6	38.4	31.2	21.6	31.2
132 KV	9.5	12.0	14.4	9.7	9.5	9.5

- **Outage Restoration Time**

  This indicator reports the length of time taken to restore supply after unplanned outages. Over the last six years, there has been a significant improvement in the response time to outages; this is shown in **Figure 4** below.

Figure 4

RESTORATION TIME TO OUTAGES



- **New Connections Back Log**

  The level of expediency in dealing with new connections is another indicator that has shown significant improvement. Generally the new connections backlog has been decreasing over the period 1996 to 2001.

Table 1

NEW CONNECTIONS BACKLOG BY MONTH

NO. OF OUTSTANDING CONNECTIONS												
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
1996	279	201	216	249	126	99	123	168	134	132	174	123
1997	131	168	138	119	151	146	105	81	118	118	148	137
1998	129	158	106	82	90	94	99	51	87	125	114	107
1999	145	55	56	64	2	75	68	69	52	46	63	52
2000	17	22	18	1	19	13	31	15	6	12	51	25
2001	5	0	6	11	28	7	14	2	8	12	17	14

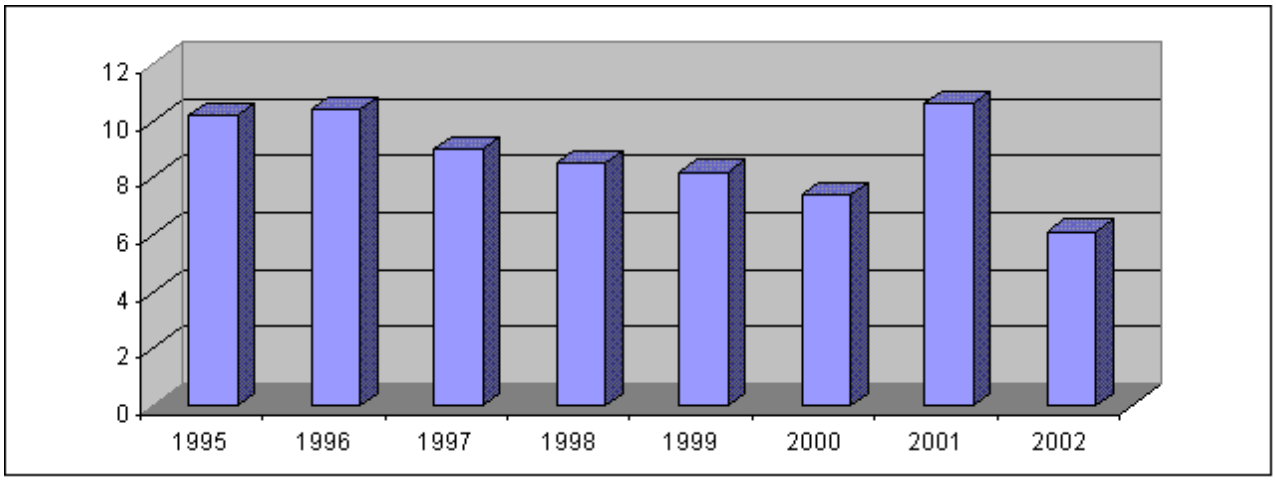
- **Electricity Losses**

  The total losses of any system are comprised of technical and non-technical losses. Adequate investment in transmission and distribution

systems together with good operating practices would minimize technical losses, while proper commercial practices would help to keep non-technical losses at a low level. Taken as a percentage of gross available energy, T&TEC's total losses as at 2002 were 6.1%. **Figure 5** shows the System Losses from 1995 to 2002.

Figure 5

TOTAL SYSTEM LOSSES



	1995	1996	1997	1998	1999	2000	2001	2002	Best Practice
Total System Losses %	10.2	10.4	9	8.5	8.2	7.4	10.6	6.1	<12

Note: Best practice figure is for Developed Countries.

It should be noted that system losses are calculated by subtracting the units of kilowatts sold from those generated, the results are then expressed as a percentage of units generated.

4. PRODUCTIVITY TRENDS

Productivity trends show the level of efficiency of a company. In this section we will be focusing on labour productivity.

4.1 Labour Productivity

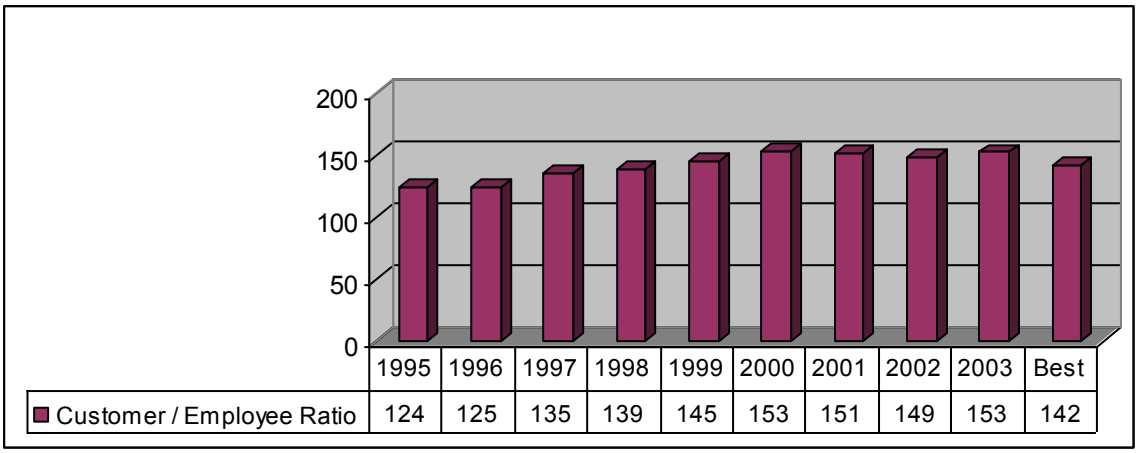
In the electricity sector, customers per employee[3] and electricity sales per employee[4] are the two most widely used indicators of labour productivity. See **Figures 6 and 7** below. Overall, the number of employees at T&TEC declined from 2,349 in 1995 to 2,281 in 2003, a decrease of 3%.

(i) Customer per Employee Ratio

The customer per employee ratio has improved from 124 customers per employee in 1995 to 153 customers per employee in 2003.

Figure 6

CUSTOMER / EMPLOYEE RATIO



	1995	1996	1997	1998	1999	2000	2001	2002	2003	Best
Customer / Employee Ratio	124	125	135	139	145	153	151	149	153	142

Note: Best practice figure for Developing Countries is 142.

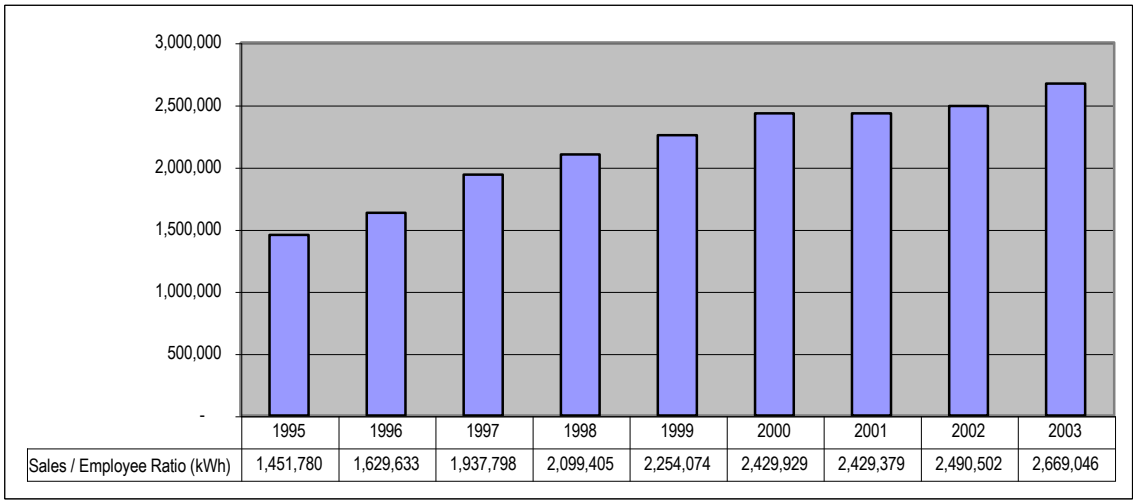
(ii) Sales per Employee Ratio

T&TEC's sales per employee ratio, also has improved from 1.45 million kWh sales per employee in 1995 to 2.67 million in 2003, an increase of 84%.

[3] The customer per employee ratio is calculated by dividing the total number of customers by the total number of employees.
[4] The sales per employee ratio is calculated by dividing the total number of megawatt-hour sales by the total number of employees.

Figure 7

SALES PER EMPLOYEE RATIO



4.2 Other Productivity Ratios

T&TEC has implemented changes in work ethic as well as reductions in crew size. Over the period 1995 to 2003 productivity levels have generally improved. See **Table 2** below.

Table 2

SUMMARY OF OPERATING PERFORMANCE

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Customers	291,067	302,220	304,138	310,938	315,482	316,017	332,921	337,902	348,022
Electricity Sales (MWh)	3,410,231	3,943,713	4,363,921	4,696,369	4,889,086	5,015,374	5,339,775	5,646,968	6,088,093
Nominal operating cost per customer ($)	3,003.55	3,216.63	3,281.87	3,435.96	3,602.11	3,990.03	3,931.32	4,103.94	4,190.01
Real operating cost per customer ($)	3,003.55	3,113.87	3,064.30	3,037.98	3,078.73	3,294.82	3,073.74	3,081.04	3,034.04
Nominal operating cost per MWh sales ($/MWh)	256.36	246.50	228.73	227.49	232.44	251.41	245.11	245.57	239.52
Real operating cost per MWh sales ($/MWh)	256.36	238.63	213.56	201.14	198.66	207.61	191.64	184.36	173.44
Index of retail prices (Base year = 1995)*	100.0	103.3	107.1	113.1	117.0	121.1	127.9	133.2	138.1

*Source: Central Statistical Office General Index of Retail Prices Trinidad and Tobago Gazette Extraordinary Various Issues 1994 - 2002

It can be observed from **Table 2** that:

- The ratio of real operating costs per customer has shown a marginal increase of 1% over the period 1995 to 2003.

- Real operating cost per MWh sales declined significantly over the period. There was a 32.3% decrease between 1995 and 2003. This can be attributed to the 78.5% increase in electricity sales from 1995 to 2003.

5. FINANCIAL PERFORMANCE

This section reviews T&TEC's financial performance focusing on financial indicators, expenditure and revenue.

5.1 Key Financial Indicators

Table 3 presents indicators useful for examining the financial health of T&TEC. Overall the measures indicate that T&TEC's financial performance has been weak.

Table 3
KEY FINANCIAL INDICATORS 1995 - 2001

	1995 $M	1996 $M	1997 $M	1998 $M	1999 $M	2000 $M	2001 $M
Total Revenue	847.6	960.4	1,113.8	1218.2	1249.5	1296.1	1351.8
Operating Expenditure	847.2	972.1	998.1	1068.4	1136.4	1260.9	1308.8
Depreciation	30.6	31.9	31.2	29.9	31.7	41.8	47.6
Net Interest Payments	53.5	48.2	60.7	69.0	30.4	64.5	116.4
Total Expenditure	931.3	1052.2	1090.0	1167.3	1198.5	1367.2	1472.8
Surplus (Deficit)	(130.9)	(76.1)	65.8	50.9	51.0	(71.1)	(121.1)
Total Assets (Book Value)	1465.1	1338.7	1568.3	1671.9	1825.0	2008.0	2146.6
Total Liabilities	703.4	642.7	768.8	771.1	866.9	1182.8	1461.7
Net Debt	691.7	629.5	753.8	754.6	846.4	1081.9	1354.8
Operating Cashflow	15.2	(118.0)	148.6	22.2	(72.8)	36.6	(272.2)
Capital Expenditure	761.8	696.0	799.4	900.8	958.1	825.2	684.9
Accumulated Deficit	655.4	729.6	663.8	612.8	563.1	710.5	861.6

Source: T&TEC

The following can be observed from the table above:

- T&TEC's total revenue grew from $847.6 million in 1995 to $1,351.8 million in 2001 reflecting an increase of 59.5%.

- Total expenditure grew from $931.3 million in 1995 to $1,472.8 million in 2001 reflecting an increase of 58.1%.

- On a year on year basis, net surplus and operating cash flow have shown significant variation.

- Net debt grew to $1,354.8 million in 2001, an increase of 95.9%, over the 1995 figure, while interest and financial charges increased from $53.5 million in 1995 to $116.4 million in 2001, an increase of 117.6%.

5.2 Additional Financial Indicators

Financial indicators are generally used by regulators to assess the financial impact of their pricing decisions. Financial indicators are ratios derived from financial statements that allow comparison with benchmarks set for the particular industry. **Table 4** below shows a set of ratios that can be used to indicate the financial strength of T&TEC.

Table 4

FINANCIAL INDICATORS ANALYSIS 1995 – 2003

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Ability to Service Debt:									
Funds flow interest cover	(2.41)	(0.25)	2.50	1.00	(3.68)	(0.57)	2.61	2.17	0.21
Pre tax interest cover	(2.19)	(0.92)	2.17	1.83	2.85	(0.13)	(0.09)	0.10	4.31
Ability to Repay Debt:									
Funds flow/net debt payable ratio	(4.58)	(1.72)	0.47	1.55	(3.03)	7.13	(2.09)	3.46	0.03
Funds from operation/total debt ratio (%)	0.03	(0.28)	0.43	0.07	(0.16)	0.08	(0.35)	0.19	(1.98)
Total debt/total capital ratio (%)	0.32	0.32	0.25	0.17	0.17	0.50	0.56	0.56	0.56
Ability to Finance Investment from Internal Services:									
Internal Financing Ratio	(3.90)	(1.25)	0.73	0.00	(0.53)	(0.59)	1.03	0.90	(0.46)
Measures of Earnings:									
Earnings before interest (TT$Mn.)	$ (77.38)	$ (27.99)	$ 126.47	$ 119.95	$ 81.37	$ (6.60)	$ (4.67)	$ 56.45	$ 471.50
Earnings before interest & Depreciation (TT$'Mn.)	$ (46.82)	$ 3.95	$ 157.71	$ 149.88	$ 113.07	$ 35.23	$ 42.96	$ 108.57	$ 544.16

Note: Figures were calculated using *T&TEC's Audited Accounts for 1995 to 2003*.

Generally, all the above indicators show T&TEC's critical financial situation.

- Funds Flow / Interest Cover shows the ability of the Commission to pay its interest cost from its available funds generated for the year. During the period 1995 to 2003 T&TEC was able to cover its interest payments in the years 1997, 1998, 2001, 2002 and 2003.

- Funds Flow / Net Debt Payable ratio shows the portion of the debt that can be met by funds earned by the utility. T&TEC was able to cover its debt in five of the seven years examined.

- Funds from operation/total debt ratio shows the portion of debt to be met from sale of electricity. In the years 1996, 1999, 2001 and 2003 T&TEC was unable to cover its debt from electricity sales.

- Total debt/total capital ratio shows the portion of the utility's operations that is funded by debt. From 2001 to 2003 a high portion of T&TEC's funding came from debt.

- Internal Financing Ratio shows the ability to finance capital projects utilizing internally generated funds. During the period under review T&TEC was in a position to finance capital from its own funds in 1997, 2001 and 2002.

5.3 Long Term Borrowing

T&TEC has had to engage in long–term borrowing to finance capital expenditure as well as to cover a portion of its recurrent costs. This is shown in **Table 5**.

Table 5
LONG TERM BORROWING AS AT DECEMBER 2003

Bonds	Purpose	Last date of repayment	Balance of Principal $
$200 Million	Generation Spares, Transmission & Distribution Development	31/03/2011	93.1
$500 Million *	Fuel arrears, Transmission & Distribution Development	29/03/2021	500.0

*** The 3-yr moratorium on debt servicing came to an end in March 2004.**

5.4 Current Liabilities and Bank Advances

Due to the fact that revenue has been inadequate, T&TEC has had to obtain working capital from short-term bank advances. In addition, amounts due to NGC remain unpaid as shown below:

Table 6
SHORT TERM ADVANCES & AMOUNTS DUE TO NGC

AGENCY	AMOUNT $M	REMARKS
NGC	244	Includes interest of $48 Million
Bankers' Acceptances at various Banks	120	$95 M secured by floating charge on assets, balance unsecured

5.5 Key Performance Indicators

Table 7 shows key performance indicators.

Table 7
KEY PERFORMANCE INDICATORS 1995 - 2001

	1995	1996	1997	1998	1999	2000	2001
Profitability ($M)	(131)[1]	(76)	66[2 & 3]	51	51	(71)[4]	(114)
Return on Average Assets (%)	(19.0)	(10.8)	8.2	5.5	4.5	(5.6)	(8.1)
Gross Profits as a percentage of Net Sales (%)	(23.5)	(20.4)	(5.0)	(0.7)	(5.0)	(10.9)	(10.7)
Net Profits before Debt Servicing as a percentage of Net Sales (%)	(11.2)	(3.4)	11.0	11.0	7.3	(0.6)	(0.004)
Working Capital as a percentage of Net Annual Sales (%)	(8.8)	(13.1)	(11.6)	(14.6)	(28.2)[5]	(41.5)[6]	(16.5)
Current Assets as a percentage of Current Liabilities (%)	82.8	69.5	77.8	71.7	53.9[5]	47.4[6]	70.8
Annual Light & Power Sales US $M	127	138	159	173	177	186	196
Unit cost of Sales (cents/kWh)	28.7	26.7	25.1	24.9	24.5	27.3	27.5
Cash break-even price including financial charges (cents/kWh)	28.7	26.7	25.1	24.9	24.5	27.3	29.0
Number of Customers	291,067	302,220	304,138	310,938	315,482	316,017	332,921
Fuel cost (cents/kwh)	5.4	5.7	6.2	6.4	6.7	7.0	7.2
Total Labour and material-related O&M costs/Total Revenues	not available	not available	not available	18.9	19.5	18.8	19.0

Note:

1) The deficit is mainly due to the impact of the first full year of contracted capacity payments to PowerGen.
2) A rate increase for large industrial customers became effective in January 1997. In addition, given a change in accounting policy, pole replacements have been capitalized rather than expensed resulting in a reduction in transmission and distribution expenses by $28M.
3) The surplus includes net insurance proceeds of $42M representing insurance settlement on submarine cable between Trinidad and Tobago.
4) The deficit is mainly due to the additional conversion cost of $95M arising from the first full year of contracted capacity payments to InnCogen Ltd. (now Trinity Power Ltd.) and interest of $20M on amounts overdue to NGC.
5) Borrowings increased by almost $200M in 1999 over 1998. The funds were mainly used to finance capital projects.
6) Borrowings for capital expenditure increased by almost $52M in 2000 over 1999. In addition, NGC's liability increased by $152M.

It can be seen in the table above that:

- During the period 1995 to 2001 T&TEC achieved profits between 1997 and 1999. The retroactive (1997) rate increase given in 1998[5] may have contributed to this profitable outturn.
- The statistic, return on average assets, evidenced positive values only in 1997, 1998 and 1999.
- Cash break-even prices have been higher than average tariffs[6] for the entire period examined.

5.6 Expenditure

T&TEC's total costs increased from $958 million in 1995 to $1,546 million in 2002, an increase of 61%. Factors contributing to this significant increase in expenditure are conversion and fuel costs, which are largely out of T&TEC's control. The details are shown below:

- Conversion costs rose from $425.5 million in 1995 to $686.7 million in 2002, an increase of 61.4%.
- Fuel costs rose from $197 million in 1995 to $391 million in 2002 an increase of 98%.
- In 2002, conversion and fuel costs represented 43% and 25% respectively of total costs.
- Generation costs have increased from $629 million in 1995 to $1,082 million in 2002, an increase of 72%.
- The price of natural gas has increased from 0.5895 US$/MMBTU in 1995 to 0.7758 US$/MMBTU in 2002, an increase of 32%.

Under the present contractual arrangement between T&TEC and NGC the price of natural gas increases annually by 4% while conversion costs increase annually in tandem

[5] The Rate Increase will be discussed in the Tariff Section on page 24.
[6] Average Tariffs can bee seen in Table 16 on page 28.

with the US Consumer Price Index. See **Tables 8, 9, 10,** and **Figure 8** below. In 2002 approximately 68% T&TEC's expenditure was for the purchase of natural gas and conversion costs. Additionally, a large portion of T&TEC's expenditure on raw materials is denominated in foreign currency (see Appendix II). It should also be noted that T&TEC has not received any government subvention since 1984.

Table 8

FUEL COSTS 1995 - 2002

YEAR	COST TT$ M	COST US$ / MMBTU
1995	197	0.5895
1996	217	0.6131
1997	252	0.6376
1998	285	0.6631
1999	301	0.6896
2000	319	0.7172
2001	339	0.7459
2002	391	0.7757

* Millions of British Thermal Units
Source: T&TEC

Table 9

DISAGGREGATION OF COSTS 1995 – 2002

Year	Generation Costs ($ M)	Transmission, Distribution & Administration Costs ($ M)	Depreciation, Interest & Finance Costs	Total Costs ($ M)
1995	629	245	84	958
1996	679	293	80	1,052
1997	761	237	92	1,090
1998	839	230	99	1,167
1999	898	239	62	1,198
2000	991	376	106	1,473
2001	1,021	288	164	1,473
2002	1,082	305	159	1,546

Source: T&*TEC Audited Accounts 1995 – 2002*.

Table 10

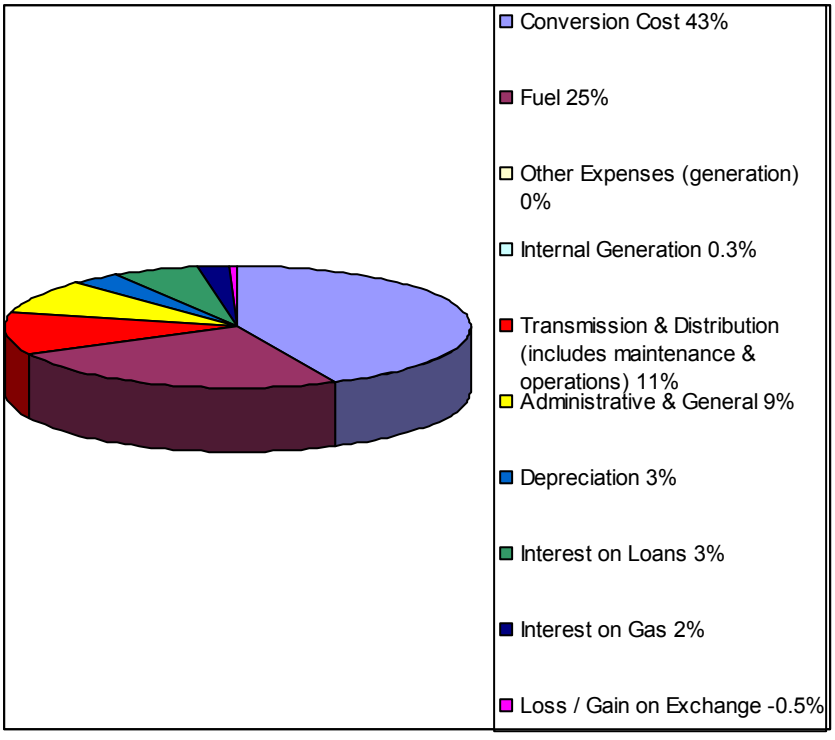
TOTAL EXPENDITURE 2002

	TT ($M)	%
Conversion Cost	686.66	43.2
Fuel	391.02	24.6
Other Expenses (generation)	6.00	0.4
Internal Generation	4.36	0.3
Transmission & Distribution (includes maintenance & operations)	175.19	11.0
Administrative & General	147.44	9.3
Depreciation	52.12	3.3
Interest on Loans	97.57	6.1
Interest on Gas	37.00	2.3
Loss / Gain on Exchange	(8.23)	(0.5)
TOTAL	**1,589.12**	**100**

Source: T&TEC, Financial Report December 2002

Figure 8

TOTAL EXPENDITURE 2002



Source: derived from **Table 10**

Table 11 reflects T&TEC's Transmission and Distribution (T&D) expenditure between 1998 and 2002. T&D expenditure (in nominal terms) only increased by 10% between 1998 and 2002, as a result of measures implemented by the company to control costs, including:

- Overtime reduction from 8% to 6.25% of basic pay.
- Productivity improvements through changes in work methods, reduction of crew sizes and closer monitoring of activities.
- Material costs reduction through a system of competitive international tendering and improved materials management.

Table 11

TRANSMISSION & DISTRIBUTION EXPENDITURE ($M) 1998 – 2002

	1998	1999	2000	2001	2002	% increase 1998 - 2002
Personnel Expenditure	$ M	$ M	$ M	$ M	$ M	%
Overtime	5.65	6.39	6.82	6.58	7.96	40.8
Gross Wages & Salaries	79.60	80.53	74.07	83.59	94.44	18.6
Contribution to Pension Paln	11.97	12.24	12.38	14.08	12.17	1.6
Cost of Medical, Welfare Facilities	3.10	3.58	4.15	5.38	5.20	67.7
Employer's contribution to NIS	1.25	2.48	3.13	5.21	3.84	208.3
Any other payments to employees	3.79	5.47	6.67	3.39	3.57	-5.9
Materials	16.00	13.43	12.43	11.53	9.83	-38.6
Maintenance	68.00	61.44	55.55	56.84	58.70	-13.7
Capitalised Personnel Expenditure	8.18	20.15	20.27	18.71	22.14	170.9
Total	**197.55**	**205.72**	**195.48**	**205.32**	**217.85**	**10.3**

Source: T&TEC Finance Department, 2003.

5.7 Capital Expenditure

Capital expenditure represents funds used to replace existing assets and to purchase new assets. **Table 12** reflects the movement in capital expenditure, in real terms, during 1995 to 2003; the levels vary on a year-to-year basis. The most significant increases in capital expenditure occurred in 1997.

Table 12

CAPITAL EXPENDITURE 1995 - 2003

	1995 $M	1996 $M	1997 $M	1998 $M	1999 $M	2000 $M	2001 $M	2002 $M	2003 $M
Capital Expenditure	35.9	39.8	114.8	153.2	243.7	167.7	172.3	135.0	159.9
Retail prices index (base yr: 1995)*	100.0	103.3	107.1	113.1	117.0	121.1	127.9	133.2	138.1
Capital Expenditure in real terms	**35.9**	**38.5**	**107.2**	**135.5**	**208.3**	**138.5**	**134.7**	**101.3**	**115.8**
Percentage Change		7.2	178.5	26.4	53.7	-33.5	-2.7	-24.8	14.3

***Source:** Central Statistical Office General Index of Retail Prices Trinidad and Tobago Gazette Extraordinary Various Issues 1994 - 2003.

5.8 Revenue

T&TEC's total sales increased from $754.7 million in 1995 to $1,439.5 million in 2003, an increase of 91%. The units sold, however, increased from 3,410 GWh to 6,088 GWh, an increase of 79% over the same period. The unit cost of sales increased by 7% over the period. See **Figures 9 and 10.**

Figure 9

LIGHT & POWER SALES ($M)
1995 - 2003

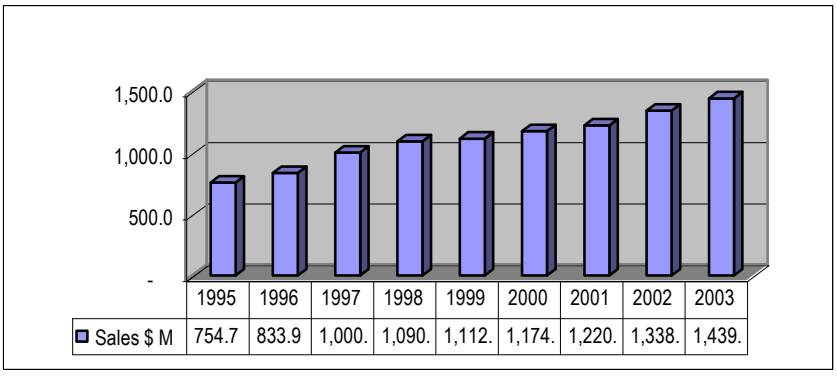
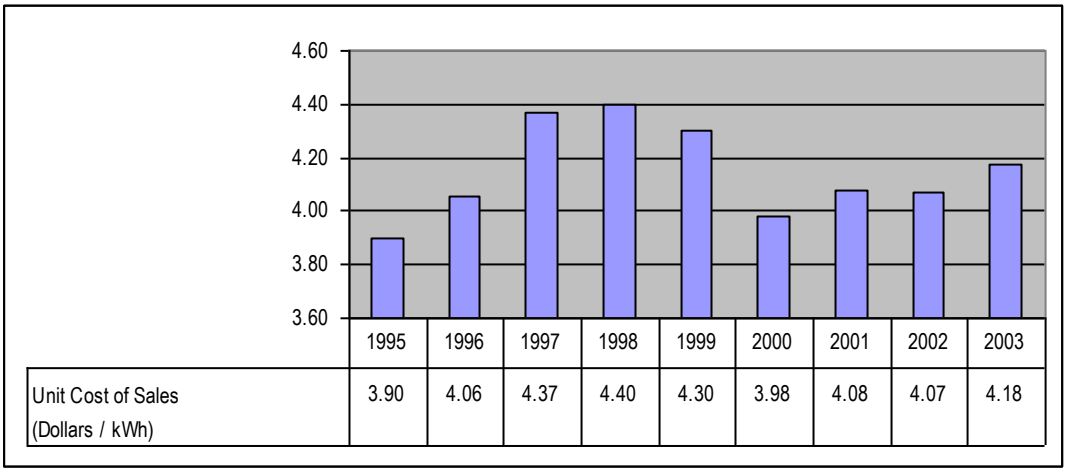


Figure 10

UNIT COST OF SALES



	1995	1996	1997	1998	1999	2000	2001	2002	2003
Unit Cost of Sales (Dollars / kWh)	3.90	4.06	4.37	4.40	4.30	3.98	4.08	4.07	4.18

5.9 Billing and Collections

One indicator that is usually 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 13** reveals consistently high levels of receivables including receivables from Government and government agencies.

Table 13

AGED ANALYSIS OF RECEIVABLES AS AT DECEMBER 2002 ($'000)

	0 - 30 Days	31 - 60 Days	61 - 120 Days	Over 120 Days
Domestic & General	26,927	12,305	7,954	5,041
Industrial	51,261	30,663	48,892	136,707
Street Lighting	2,170	1,729	2,490	11,353
Total	**80,358**	**44,697**	**59,336**	**153,101**

Of Which:

	0 - 30 Days	31 - 60 Days	61 - 120 Days	Over 120 Days
Government	4,483	2,702	1,661	3,557
Statutory Boards	7,835	7,569	5,336	37,116
State Enterprises	710	102	18	0.457
Total	**13,027**	**10,374**	**7,015**	**40,673**

Source: T&TEC Finance Department, 2003.

Table 14 shows the total outstanding debt by all categories of customers over the period 1996 to 2001. T&TEC's debtors balance rose from $197.8 million in 1996 to $368.3 million in 2001, an increase of 86%.

Table 14

T&TEC LIGHT & POWER DEBTORS & REVENUE 1996 – 2001 ($M)

	1996	1997	1998	1999	2000	2001
TOTAL DEBTORS - Domestic, General, Industrial & Street Lighting Customers	197.8	254.1	274.5	261.1	314.9	368.3
***No. of Customers**	302,222	304,138	310,938	315,482	316,017	332,921
Revenue ($M)	960.4	1113.8	1218.2	1249.5	1296.1	1351.8

Sources: T&TEC Audited Accounts 1996 - 2001
* T&TEC Financial Reports 1996 - 2001

An indicator that is normally used to measure improvements in efficiency of commercial practices is the provision for bad debts. **Table 15** shows the movement in the provision for bad debt between 1997 and 2003. An increase of 36% from $49.5 million in 1997 to $67.5 million in 2003 is noted. However, when the provision for bad debt is expressed as a percentage of sales, little variation is seen. This implies that T&TEC's collection policy has remained the same over the seven-year period.

Table 15

PROVISION FOR BAD DEBT 1997 - 2003

	1997	1998	1999	2000	2001	2002	2003
Provision for bad & doubtful debts ($M)	**49.5**	**55.1**	**49.4**	**51.8**	**59.3**	**78.4**	**67.5**
Sales ($M)	**1,000.2**	**1,090.9**	**1,112.2**	**1,174.2**	**1,220.8**	**1,338.9**	**1,439.5**
Provision for bad debt as a % of Sales	**5.0**	**5.0**	**4.4**	**4.4**	**4.9**	**5.9**	**4.7**

6. TARIFFS

Tariffs are charges levied by utilities for services. Tariffs should be sufficient for any regulated business to recover costs. To determine the total cost of service, regulators normally use a 'building block' model that calculates total costs as a combination of the operating expenditure, depreciation and the allowable return on capital (rate of return). While an assessment of each of the 'building blocks' is central to price determination, consideration must be given to the implications of the pricing outcome on consumers and efficiency improvements.

T&TEC has been operating with an unchanged tariff structure for many years, despite its increasing costs of operations. Tariffs for rate A, B, D1, D2, and street lighting customers were last adjusted in 1992. An adjustment to its D3 and E customers was granted in 1998. This affected only 15 of T&TEC's account holders and resulted in an overall increase in revenue of about 3%.

Table 16 and **Figure 11** below reveal that the average electricity tariff in real terms was significantly lower than the nominal tariff over the period 1993 to 2003. The rate increase awarded in 1998 for some industrial customers led to an increase in the nominal tariff in 1998. However, the increase was not sufficient to offset the increase in inflation that occurred during that period and therefore it was not significant.

The underlying reason for this trend is that measures were applied to keep consumer tariffs artificially low as a means of addressing social equity issues. Experience worldwide has shown that in general such policies are costly and ineffective for dealing with these issues.

Table 16

AVERAGE TARIFF - DOMESTIC GENERAL & INDUSTRIAL

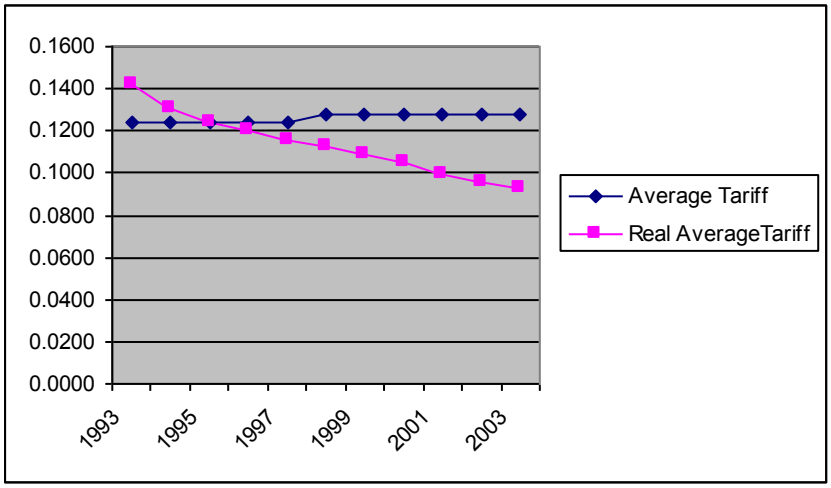
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Average Tariff ($) Rates A, B, D1, D2, D3 & E	0.1241	0.1241	0.1241	0.1241	0.1241	0.1275	0.1275	0.1275	0.1275	0.1275	0.1275
retail prices index (base yr: 1995)*	87.3	95.0	100.0	103.3	107.1	113.1	117.0	121.1	127.9	133.2	138.1
Real Tariff TT($)	0.1421	0.1306	0.1241	0.1201	0.1159	0.1127	0.1090	0.1053	0.0997	0.0957	0.0923

*Source: Central Statistical Office General Index of Retail Prices Trinidad and Tobago Gazette Extraordinary Various Issues 1994 - 2003

The average tariff in real terms decreased by 35% over the period 1993 to 2003.

Figure 11

T&TEC AVERAGE TARIFF 1993 - 2003



6.1 Comparative Analysis of Tariffs

T&TEC's tariffs are the lowest in Latin America and the Caribbean. See **Table 17** below. It should be noted that it is difficult to compare electricity prices across countries because tariff schemes may vary from country to country, the cost of providing the service may vary between countries, and electricity services are often subsidized, making comparisons even more difficult.

Table 17

DOMESTIC CONSUMER PRICES (JUNE 2002)			
	ELECTRICITY US cent/kWh		
COUNTRY	RESIDENTIAL	COMMERCIAL	INDUSTRIAL
ARGENTINA	2.9	3.66	1.71
BARBADOS	20.41	21.37	20.35
BOLIVIA	5.8	9.16	4.57
BRASIL	9.0	7.56	3.83
COLOMBIA	7.67	6.77	6.84
COSTA RICA	6.47	9.38	7.41
CUBA	12.57	10.04	7.63
CHILE	8.09	7.74	5.38
ECUADOR	8.7	8.6	8.14
EL SALVADOR	12.31	13.56	13.56
GRENADA	22.14	23.38	18.77
GUATEMALA	7.87	6.18	7.41
GUYANA	5.88	8.94	7.87
HAITI	9.26	13.66	13.07
HONDURAS	7.12	10.05	5.87
JAMAICA	13.06	11.8	10.14
MEXICO	7.58	13.03	17.14
NICARAGUA	11.22	13.77	10.98
PANAMA	12.08	11.76	9.9
PARAGUAY	5.16	5.48	3.46
PERU	9.32	6.27	5.93
REP. DOMINICANA	8.15	8.25	9.74
SURINAME	17.08	17.3	13.13
TRINIDAD & TOBAGO	**2.82**	**3.1**	**2.38**
URUGUAY	11.19	9.76	5.54
VENEZUELA	5.5	7.9	2.8

Source: http://www.olade.org.ec/ (2003)

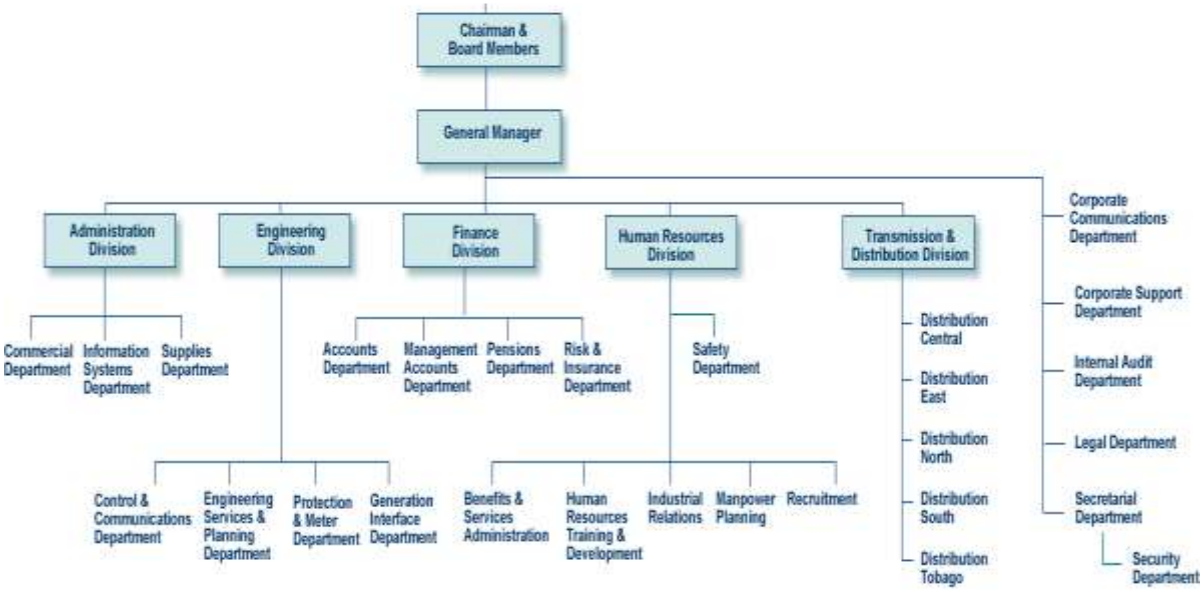
7. CONCLUSION

This review of the operational and financial state of T&TEC clearly suggests that, notwithstanding its poor and deteriorating financial state, its operational performance is at acceptable standards and that many of the key operational indicators have reached acceptable international levels. However, the continued maintenance and improvement of its operational performance require not only continued good management but also

adequate financial resources, which are possible through timely and appropriate pricing policies.

APPENDIX I

T&TEC ORGANISATIONAL STRUCTURE



APPENDIX II

AVERAGE UNIT COST OF SOME MAJOR IMPORTS 1997 - 2001

Description	1997 ($)	1998 ($)	1999 ($)	2000 ($)	2001 ($)
Transformer: 25 KVA Single Phase	3,267.24	3,283.99	3,284.00	3,341.74	3,307.62
Transformer: 37.5 KVA Single Phase	3,776.05	4,021.10	3,789.41	2,773.04	3,941.53
Transformer: 50 KVA Single Phase	4,349.63	4,852.02	4,176.37	4,461.50	4,311.08
Transformer: 75 KVA Single Phase	6,060.92	6,057.48	6,688.00	6,101.90	6,534.73
Transformer: 100 KVA Single Phase	6,435.79	9,890.01	9,359.00	8,245.42	7,663.05
Poles: 10m Wallaba	427.04	643.48	950.35	950.34	950.34
Poles: 12.2m Wallaba	588.00	826.23	749.72	749.72	749.72
Poles: 10m Concrete	674.06	680.00	501.71	527.50	527.50
Poles: 12.2m Concrete	1,240.00	1,240.00	923.70	968.19	968.19
Poles: 10m Steel	1,025.69	1,217.96	1,217.96	1,600.15	1,626.83
Poles: 10m Steel	1,724.62	1,812.47	2,091.05	2,276.21	2,077.32
Conductor: 1/0 All Aluminum	7.16 / lb	7.16 / lb	7.15 / lb	6.86 / lb	6.62 / lb
Conductor: 4/0 All Aluminum	7.08 / lb	7.08 / lb	7.08 / lb	7.08 / lb	6.68 / lb
Conductor: 1/0 A.C.S.R.*	5.32 / lb	5.43 / lb	5.42 / lb	5.61 / lb	5.53 /lb
Conductor: 4/0 A.C.S.R.*	5.96 / lb	5.76 / lb	5.76 / lb	5.76 / lb	5.78 / lb
Insulators: 12kv Pin Type	19.00	18.52	18.52	17.99	15.04
Insulators: 66mm Glass Disc	47.62	47.84	47.84	78.94	61.57
Insulators: 20mm Glass Disc	65.53	50.82	56.90	56.90	44.01

*Aluminum Conductor Steel Reinforced