

## KPTCLs PREDOMINANT ROLE IN INFRASTRUCTURE ENHANACEMENT AND VALUE CREATION

Anuradha T.S<sup>[a]</sup>

Yeshwant Rao N<sup>[b]</sup>

Sandhya C<sup>[c]</sup>

### Abstract

The rapid growth of industries in the country has helped in nurturing of many opportunities and new opportunities have thrown immense challenges to the firms to be excellent among the best in their respective market operations. The emphasis has been laid to produce the services in an efficient and eminent manner which can provide the customers delight over their decisions to invest their 5 Ms in that particular country. Power sector is one of the most growing sector and has become one of the most elastic product in context of creating and retaining new and old customers respectively. The paper is an attempt to understand the KPTCL role as a power distributors and an effort to analyze the value its creating to both its customers and investors at a large. The study was undertaken by analyzing the various financial statements and conclusions were provided on the same notations.

Keywords: Transmission, Distribution, Industrialization, Electricity

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| <sup>[a]</sup> <b>Anuradha T.S</b><br>Faculty Member,<br>Dept of P.G Studies and<br>Research in Commerce and<br>Management ,<br>Sahyadri College Campus,<br>Shimoga,<br>Email:anusg20@gmail.com | <sup>[b]</sup> <b>Yeshwant Rao N</b><br>Faculty Member,<br>Dept of P.G Studies and<br>Research in Commerce and<br>Management ,<br>Sahyadri College Campus,<br>Shimoga,<br>Email:<br>rao.nyeshwant@gmail.com | <sup>[c]</sup> <b>Sandhya C</b><br>Research Scholar,<br>Institute of Management<br>Studies & Research,<br>Kuvempu University, e<br>Email:<br>s3sandhya@gmail.com,<br>s3sandhya@gmail.com |
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### 1. Introduction

The growth of industrialization has proved to boom for the whole economy as it has provided the customers with immense alternatives and firms also has been provided with potential market for their respective growth . As more and more industries started arriving in the market, the need for effective infrastructure facilities was always on the cards. The globalization of markets has brought immense challenges not only to the small scale industries but to all those industries who were actively involved in providing qualitative infrastructure facilities to the economy as whole. One of the most important industry in that context are electric companies which are engaged in continuously providing of electricity to the firms. Electricity has played such a constituent role in overall developing of infras tructure that firms today can't imagine themselves without the electricity. Power companies are striving there heart out to provide enhanced amount of power security to the economy as a whole, but due to global enhancement of the demand , it requires an proper planning and effective controlling of the power outlets. Due to the enhanced demand in the need for power sector, power companies are trying their level best to understand the various sources from where it can be raised at the same period of time after procuring the electric units , the power companies are contributing their level best to ensure effective steps to utilize the same in an

effective and efficient manner. Power companies are engaged in efficient planning to distribute the electricity in the best manner. Government has always taken a keen interest in providing adequate financial and legal supports to ensure that markets are provided with uninterrupted power supply. Enormous norms and policies have been developed and remaining will be coming in the days to come, but one thing can be observed that electricity management requires enormous amount of investment and it is left to the Govt to raise the finance from the selected avenues. The cost of procuring also have to be considered and companies should always keep in their mind that as more and more growth of industry is going the need of the same will always be enhancing.

## 2. Review of Literature

**Sreekumar (2008)** reviews the market-oriented power sector reforms initiated in India in the early 1990s. It brings out a public interest oriented critique of the three phases of the reforms — firstly, privatization of generation, secondly, state sector restructuring and finally, the ongoing reforms since the passage of the Electricity Act 2003.

**Remes (2007)** talks about Russia fourth largest user of electricity in the world, he talks about RAO UES which controls all the transmission, distribution and supply of electricity, it controls everything except nuclear power. Anatoly Chubais, The very core of the reform has been to separate competitive businesses from natural monopolies. It is of utmost importance for the future, to prevent the creation of any monopoly structures on the markets. UES is suggesting a change in the law allowing the Antimonopoly Agency to interfere immediately when the share of any company in any regional free-flow markets fluctuates

**Singh (2006)** address the Power sector reforms in India. Reforms were initiated at a juncture when the sector was plagued with commercial losses and burgeoning subsidy burden. Investment in the sector was not able to keep pace with growing demand for electricity.

**Kumar , Khetan & Thapa (2005)** highlights that India has set itself an ambitious target of more than doubling per-capita electricity consumption by 2011. Indian power sector, with current electricity shortages of over 11% of peak and 7% of energy, will be one of the key determinants to future growth. The Indian government has worked steadily to liberalise the sector and initiated reforms that culminated in the Electricity Act 2003. The Act brought together structural and regulatory reforms designed to foster competitive markets, encourage private participation and transform the state's role from service provider to regulator.

## 3. Objectives of the Study

1. To analyze the role of power sector in infrastructure enhancement
2. To analyze the operations and evaluate the financial position of the KPTCL

## 4. Research Methodology

The study mainly relied on historical data which was collected from official records of KPTCL, Annual publications and records. The study was restricted to the investment incurred by KPTCL and its income generation activities , statistical records restricted to the year 2010-11 and 2011 -12. Secondary sources predominantly used in the study to collect

information on different statements, collected data was analyzed and presented for proper understanding

## **5. Findings & Discussions:**

### **History of KPTCL**

The KPTCL was formed on 01.08.99 and is entitled to distribute electricity in a cheapest manner in the whole Karnataka region. The KPTCL was formed after passing out the bill in the Karnataka Legislation which was mainly incorporated with providing enhanced amount of electricity at a efficient rate to the various users of the same. Before 1999 the KPTCL was private player which was called with the name of Karnataka Electricity Board and was mainly accredited with profit making as prime motto. The authorized share capital of the company is 1455 crore. This headed by a chairman and Managing Director at the corporate office. He is assisted by four functional Directors. The Board consists of four functional Directors and a maximum of 12 functional Directors. Karnataka Power Transmission Corporation Limited is mainly vested with the functions of Transmission of power in the entire State of Karnataka and also Construction of Stations & Transmission Lines and maintenance of 400/220/110/66 KV Sub-Stations. Many new lines and Sub-Stations were added & existing stations were modified in the Transmission network. It operates under a license issued by Karnataka Electricity Regulatory Commission. KPTCL serves nearly 1.82 crores consumers of different categories spread all over the State. KPTCL has installed capacity of 13260.40 MW. KPTCL has 4 No. 400 KV Station, 91 No. of 220 KV Station, 337 No. of 110 KV Station and 549 No. of 66 KV Station. The Total Transmission Line in CKMs comes around 40000 as on 31.01.2013. The various wings of KPTCL is as follows:

- Corporate Office at Kaveri Bhavan, Bangalore
- Six Transmission zones, each zone is headed by a Chief Engineer.
- State Load Despatch Centre
- SCADA(Supervisory Control and Data Acquisition)

The annual turnover of the Organisation was nearly Rs. 1686 crores during the year 2011-12.

## Analysis of Financial Statements

### Profit & Loss A/C

| Particulars                                    | Current Year 2011-12 in Crores (Rs) | Previous year 2010-11 in Crores (Rs) |
|--|-------------------------------------|--------------------------------------|
| Revenue from operations(Transmission of Power) | 1663.01                             | 1426.81                              |
| Other Income                                   | 22.98                               | 28.03                                |
|  |                                     |                                      |
| <b>III Total Revenue (I + II)</b>              | <b>1685.99</b>                      | <b>1454.84</b>                       |
| Power Purchase and Wheeling Charges            | 0.54                                | 1.15                                 |
| Employee Costs                                 | 489.27                              | 386.79                               |
| Repairs and Maintenance                        | 85.65                               | 70.91                                |
| Administrative and Other Expenses              | 36.96                               | 31.07                                |
| Finance Costs                                  | 496.82                              | 428.90                               |
| Depreciation and Amortization expenses         | 449.53                              | 406.99                               |
| Others   | 118.51                              | 110.16                               |
| Add/(Less) : Prior period credits/(charges)    | 5.06                                | 17.23                                |
| Exceptional Items                              | -5.06                               | 0.00                                 |
| <b>Total Expenditure</b>                       | <b>1677.28</b>                      | <b>1453.21</b>                       |
| <b>Profit Before Tax</b>                       | <b>8.71</b>                         | <b>1.63</b>                          |
|  |                                     |                                      |
| <b>Tax Expense</b>                             |                                     |                                      |
| Provision Tax                                  | 1.04                                | 0.77                                 |
| <b>Net profit after Tax</b>                    | <b>7.67</b>                         | <b>0.87</b>                          |

The above table clearly reveals that the firms revenue from operations for current year 2011-12 in crores is 1663.01 and for the year ending 2012-2013 the same stands at 1426.81. Further in the table we can observe that other income for the previous stands at 22.98 and for the current year same stands at 28.03. The table helps to identify that the total amount of revenue generated was 1685.99 in previous year and in the current year the same stands at 1454.84 respectively. When it comes to expenses we can observe that power purchase and wheeling charges were 0.54 and 1.15 in previous and current year respectively. Further the table helps to understand that employees cost were Rs 489.27 and 386.79 in the span of two years. Further the table helps to state that Repairs and Maintenance were Rs 85.65 and 70.91 respectively. The contribution of Administrative and other expenses to overall p&l a/c was

attributed to be Rs 36.96 and 31.07 respectively. The contribution of finance costs was attributed to be 496.82 and 428.90 respectively. Further we can observe that depreciation and amortization expenses were attributed at 449.53 and 406.99 respectively. As far as others were considered the same stood at 118.51 and 110.16 respectively. The amounts prior to credit periods were stood at 5.06 and 17.23. Exceptional expenses contributed in negative manner and Total expenditure was 1677.28 and 1453.21 respectively. Profit before tax was 8.71 and 1.63 respectively. The tax provision was standing at 1.04 and 0.77 respectively. The net profits before tax were standing at 7.67 and 0.87 respectively.

The above table clearly signifies that there has been an increase of 10 - 15% in revenue from operation (Transmission of power) due to the increase in the unit prices and Government policies to provide regular flow of power to every village and town has make the revenue generation at its highest peak as there has been sudden increase in the demand for the same. At the same time the data stipulates that there has been increase in the employee cost , Repairs and Maintenance, Deprecation and Finance Cost due to expansion plans of KPTCL in ensuring higher supply of power to meet the ever growing demand of the market in general and individual consumers in particular.

### Balance Sheet

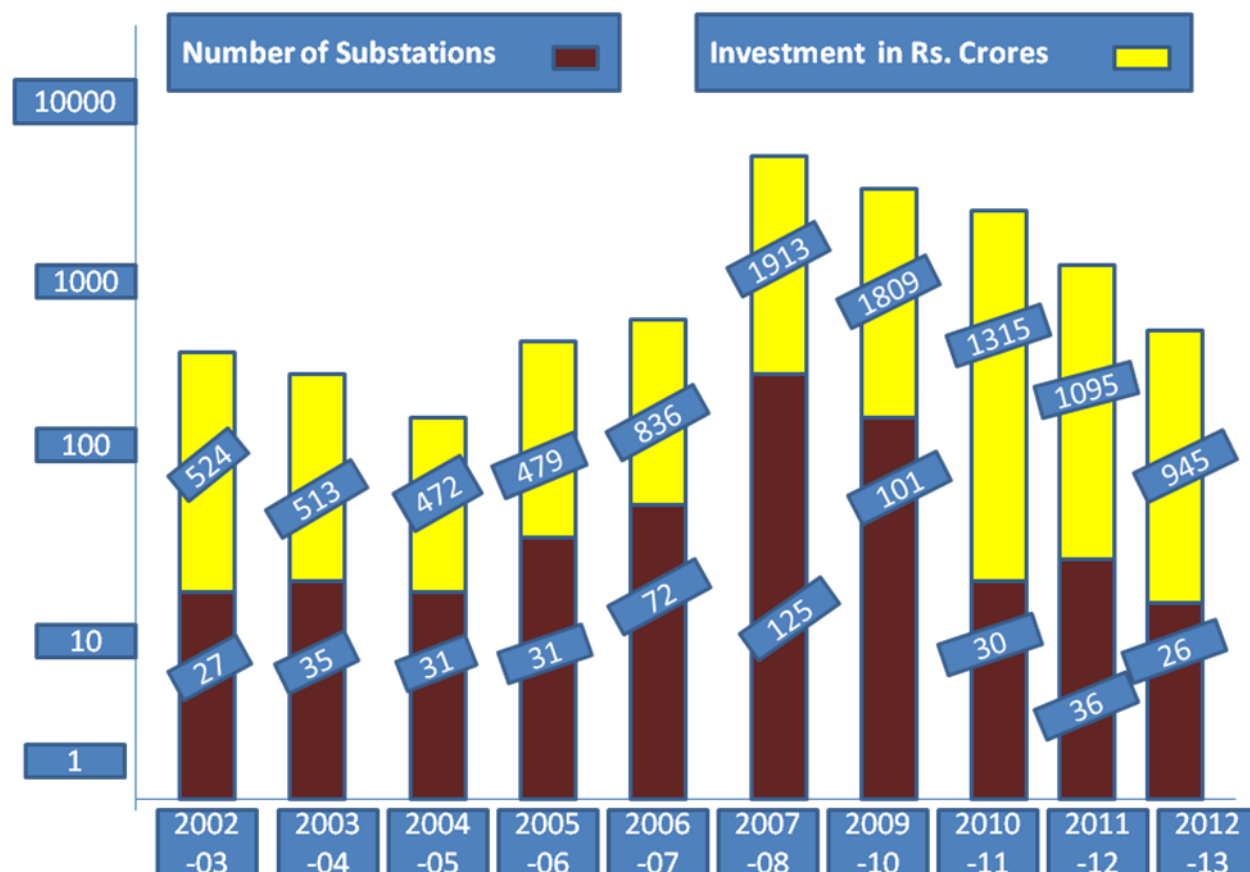
| Sl. No    | Particulars                                       | as at 31.03.2012 | as at 31.03.2011 |
|-----------|---|------------------|------------------|
| <b>I</b>  | <b>EQUITY AND LIABILITIES</b>                     |                  |                  |
| <b>1)</b> | <b>Shareholder's Funds</b>                        |                  |                  |
| a)        | Share Capital                                     | 1123.26          | 690.32           |
| b)        | Reserves and Surplus                              | 499.52           | 422.14           |
| <b>2)</b> | <b>Equity Infusion (Shares pending allotment)</b> | <b>552.06</b>    | <b>885</b>       |
| <b>3)</b> | <b>Non- Current Liabilities</b>                   |                  |                  |
| a)        | Long term borrowings                              | 4539.45          | 4537.3           |
| b)        | Deferred tax liability (Net)                      | 274.29           | 274.29           |
| c)        | Other long term liabilities                       | 1351.78          | 2126.18          |
| d)        | Long term provisions                              | 33.41            | 25.86            |
| <b>4)</b> | <b>Current Liabilities</b>                        |                  |                  |
| a)        | Short term borrowings                             | 700              | 522              |
| b)        | Trade payables                                    | 1688.06          | 1588.92          |
| c)        | Other current liabilities                         | 1201.12          | 946.18           |
| d)        | Short term provisions                             | 84.01            | 116.9            |
|           | <b>TOTAL Liabilities</b>                          | <b>12046.95</b>  | <b>12135.1</b>   |
| <b>II</b> | <b>ASSETS</b>                                     |                  |                  |
| <b>1)</b> | <b>Non- Current Assets</b>                        |                  |                  |
| a)        | Fixed assets                                      |                  |                  |
|           | (i) Tangible Assets                               | 6828.27          | 6329.5           |
|           | (ii) Intangible Assets                            |                  |                  |
|           | (iii) Capital work in progress                    | 1789.53          | 1771.73          |

|           |                              |                 |                |
|-----------|------------------------------|-----------------|----------------|
| b)        | Long term loans and advances | 123.15          | 195.47         |
| c)        | other non-current assets     | 2686.72         | 2958.38        |
| <b>2)</b> | <b>Current Assets</b>        |                 |                |
| a)        | Inventories                  | 108.21          | 106.09         |
| b)        | Trade receivables            | 202.99          | 244.84         |
| c)        | Cash and cash equivalents    | 173.81          | 393.04         |
| d)        | Short term loan and advances | 2.82            | 3.89           |
| e)        | Other current assets         | 131.45          | 132.17         |
|           | <b>TOTAL Assets</b>          | <b>12046.95</b> | <b>12135.1</b> |

The table reveals that share capital of the firm was stood at 1123.26 and 690.32 respectively. Further it can be observed that in the year of 2012 the amount of Reserves and Surplus were Rs 499.52 and were Rs 422.14 for the year 2013. Further we can observe that Equity Infusion (Shares pending allotment) were Rs 552.06 and Rs 885 respectively for 2 years. Further we can observe that Long term borrowings were **Rs** 4539.45 and Rs 4537.3 respectively for the previous and current years. The Deferred tax liabilities (Net) were standing at Rs 274.29 for both the year. Other long term liabilities were standing at Rs 1351.78 and 2126.18 respectively. The long term provisions were standing at 33.41 and 25.86 respectively. The short term borrowings were standing at Rs 700 and Rs 522 respectively. The trade payables were standing at Rs 1688.06 and Rs 1588.92 respectively. The Other current liabilities were standing at Rs1201.12 and 946.18. The short term provisions were standing at 84.01 and for the next year it was 116.9. The tangible assets were standing at 6828.27 and 6329.5 respectively. The capital work in progress was estimated to be 1789.53 and 1771.73. The amount of long term advance was observed to be 123.15 and 195.47 respectively. The other noncurrent assets were estimated to be 2686.72 and 2958.38 respectively. The Inventories were estimated to be 108.21 and 106.09 respectively. Further it can be estimated that Trade receivables were Rs 202.99 and 244.84 for the individual years. As the time progress we can observe that Cash and cash equivalents were standing at 173.81 and 393.04 respectively. The short term loans and advances were estimated to be 2.82 and 3.89 for consecutive years , whereas other current assets were standing 131.45 and 132.17 respectively.

The table further signifies that there has been increase in the amount of share capital from previous year due to the fact that KPTCL has preferred more of equity in their capital structure due to the increasing interest rate in long term borrowings. These have further reduced the equity infusion which the KPTCL has kept higher in the previous year. The role of other long term liabilities has also decline to the higher interest rate prevailing in the market. Due to the expansion programmes adopted by the KPTCL the majority of working capital expenses has been financed through the usage of current liabilities in the overall capital structure. Hence we can find an enhanced share of the same in the Balance Sheet. The

Balance Sheet prevails that as firms have infused more and more amount of equity share capital in their capital structure the usage of long term borrowings have reduced but we can identify further that as the KPTCL has gone for expansion of their business operations the amount of tangible assets have significantly increase and due to which we can identify that amount of current asset have steeply declined as compared to the previous year.



The above table clearly reveals that in 2002-03 the investment was done in Rs 524 Crores and in the same year we can identify that the number of subsystem was standing 27. At the next year we can see that investment was reduced to 513 and the numbers of substations were standing at 35. Later in the year of 2004-05 we can easily see that the investment was estimated in 472 crores and the number of substations were 31. As the time progressed we can see that the investment was enhanced to Rs 479 and the number of substations were standing firmly at 31. We can further observe that the investment was in the range of 836 and numbers of substations were estimated to be 72. It has further observed that in the year of 2007-08 the numbers was standing at 1913 for investment and 125 for the number of substations. As the time enhances we can further find out that for the year of 2008-09 the investment amount was standing 1809 and 101 respectively. In the year of 2009-10 we can find out that the numbers was Rs 1315 and 30 for both the two variables. In the year of 2010-11 we can identify that was Rs 1095 and 36. In the last year we can find out that the same number stood at 945 and 26 respectively.

The table reveals that the amount of sub stations have gradually increased due to enhanced amount of investment from 2002-03 to 2006-07. This is due to fact that there has been enhanced amount of demand in the same period of time. This can be further observe that



in 2008-09 the amount of investment of has started falling till 2011-12 due to the fact that investment were enhanced to meet the current requirement of sub stations. Hence we can say that as the cost of substations were increased , the size of investment was also increased.

### GENERAL CAPITAL BUDGET FOR 2013-14

(Rs in Lakhs)

| Category | Particulars  | Bangalore Zone | Bagalkote Zone | Gulbarga Zone | Hassan Zone | Myso re Zone | Tumkur Zone | Total   |
|----------|--|----------------|----------------|---------------|-------------|--------------|-------------|---------|
| <b>A</b> | Providing new 11kV Switch Gears, Replacement of faulty switch gears and Retrofitting of switch gears & others  | 377.00         | 392.00         | 200.00        | 478.00      | 109.00       | 300.00      | 1856.00 |
| <b>B</b> | Replacement of faulty EHV breakers / faulty CTs / faulty PTs / faulty CR panels / faulty Relays / faulty Battery & Battery Charges, Earthmat works & | 224.00         | 374.00         | 170.00        | 525.00      | 75.00        | 163.00      | 1531.00 |

|          |  |        |        |        |         |        |        |         |
|----------|--|--------|--------|--------|---------|--------|--------|---------|
|          | Bus bar protection & others  |        |        |        |         |        |        |         |
| <b>C</b> | Realignm ent of EHT lines, Providing intermedia te towers, Strengthe ning of transmissi on lines, Replacem ent of insulator and towers footings & others | 100.00 | 500.00 | 100.00 | 848.00  | 17.00  | 6.00   | 1571.00 |
| <b>D</b> | Replacem ent of Faulty Capacitors  | 293.00 | 0.00   | 85.00  | 36.00   | 2.00   | 25.00  | 441.00  |
| <b>E</b> | Replacem ent of failed power transform er  | 331.00 | 375.00 | 500.00 | 145.00  | 50.00  | 25.00  | 1426.00 |
| <b>F</b> | Survey & Investigati on  | 50.00  | 65.00  | 215.00 | 193.00  | 30.00  | 50.00  | 603.00  |
| <b>G</b> | i) Land acquisiti on   | 400.00 | 610.00 | 250.00 | 1005.00 | 100.00 | 100.00 | 2465.00 |
|          | ii)  |        |        |        |         |        |        |         |

|          |   |                |                |                |                |               |                |                 |
|----------|---|----------------|----------------|----------------|----------------|---------------|----------------|-----------------|
|          | Levelling & area fencing  |                |                |                |                |               |                |                 |
| <b>H</b> | Retrofitting of Distance Relays in 220kV Stations                     | 384.00         | 0.00           | 0.00           | 169.00         | 5.00          | 0.00           | 558.00          |
| <b>I</b> | Protection Equipments & Metering                                      | 248.00         | 0.00           | 0.00           | 236.00         | 5.00          | 0.00           | 489.00          |
| <b>J</b> | Exclusive 11kV Switch gears for Niranthara Jyothi works               | 250.00         | 262.00         | 100.00         | 210.00         | 30.00         | 600.00         | 1452.00         |
| <b>K</b> | Budgetary grant for procurement of materials for Minor Capital Works. | 400.00         | 90.00          | 150.00         | 33.00          | 175.00        | 50.00          | 898.00          |
|          | <b>Total</b>  | <b>3057.00</b> | <b>2668.00</b> | <b>1770.00</b> | <b>3878.00</b> | <b>598.00</b> | <b>1319.00</b> | <b>13290.00</b> |

The below reveals that providing new 11KV Switch Gears, Replacement of faulty switch gears and Retrofitting of switch gears & others were estimated to be Rs 377 for Bangalore , Rs 392 for Bagalkote and for Gulbarga Zone it was estimated to Rs 200.00. And further it was estimated that for Hassan Zone the amount was 478.00 whereas for the Mysore Zone the same was standing at 109 and for the Tumkur Zone the amount stood at 300 making it a total of 1856.00. Further it was observed that Replacement of faulty EHV breakers / faulty CTs / faulty PTs / faulty CR panels / faulty Relays / faulty Battery & Battery Charges,

Earthmat works & Bus bar protection & others were standing at 224 , 374.00, 170.00, 525.00 , 75.00, 163.00 for the zones of Bangalore, Bagalkote , Gulbarga , Hassan, Mysore and Tumkur zone respectively. It can be further observed that Realignment of EHT lines, Providing intermediate towers, Strengthening of transmission lines, Replacement of insulator and towers footings & others were 100.00 for Bangalore, 500.00 for Bagalkote, 100.00 for Gulbarga, 848.00 for Hassan, 17.00 for Mysore and 6.00 for Tumkur zone. It can be further observed that Replacement of Faulty Capacitors were 293, 0.00, 85, 36, 2 and 25 respectively for all the zone . The replacement of failed transmission was attributing to be 331, 375, 500,145, 50 and 25 respectively. As far as Survey & Investigation was 50, 65, 215, 193, 30 and 50 respectively for Bangalore, Bagalkote , Gulbarga , Hassan, Mysore and Tumkur zone. Land acquisition and Levelling & area fencing were 400.00, 610.00, 250.00, 1005.00, 100 and 100 respectively for the zone of Bangalore, Bagalkote , Gulbarga , Hassan, Mysore and Tumkur. The table further reveals that Retrofitting of Distance Relays in 220kV Stations were 384, 0.00, 0.00, 169, 5, 0.00 for Bangalore, Bagalkote , Gulbarga , Hassan, Mysore and Tumkur. As far as Protection Equipments & Metering were considered the same stood at 248.00, 0.00, 0.00, 236.00, 5.00, 0.00 for all zones ranging from Bangalore to Tumkur Zone. Exclusive 11kV Switch gears for Niranthara Jyothi works were estimated to be 250.00, 262.00,100, 210, 30, 600 for all zones from Bangalore to Tumkur Zone. Further it was observed that Budgetary grant for procurement of materials for Minor Capital Works were estimated to be 400.00, 90, 150, 33, 175, 50 for the zones of Bangalore, Bagalkote , Gulbarga , Hassan, Mysore and Tumkur.

The above table reveals that in the year of 2013-14 we can find that providing new switch gears and replacement of the faulty switch gears have been given due preference. The above table reveals that in the Hassan zone the expenses have enhanced for the same. Further we can find out that in the future time the EHV/ Faulty batteries have enhanced further . It is observed that providing intermediate towers and strengthen the transmission lines carries have been given significance importance and due to which Hassan zone expenses has increased significantly as expansion plans are undertaken there. The replacements of faulty capacitors have further increased the expenses of the KPTCL. Replacement of failed transmitters coupled with enhanced amount of investment in survey and investigation and policies of new land equipments have created additional capital expenditure for KPTCL. The new initiatives undertaken by the KPTCL have made the expenses to reach new height and the result of the same can be expected in future times.

## 6. Policy Implementation and Conclusion

KPTCL is one of the company which is vested with creating and delivering uninterrupted amount of power to the various players in the Karnataka State. The company is formed under the Karnataka Reforms Act and is efficiently creating an opportunity to the other industries in operating their respective potential. The company has been trying its best to ensure that the power is available to all its customers and is trying sufficiently in the process to create value to its various investors who have trusted and invested in the company. The power distribution channel of KPTCL is excellent and is proving to be an efficient player in understanding the need and wants of the consumers and providing solutions to their enhanced amount of problems. KPTCL capital budget statement has helped us to understand that company is engaged in undertaking various long term investment decisions which will create value for the KPTCL in the coming years. The expenses in Hassan region was an prolific example where the company wants itself to be after completion of subsequent years of operations. KPTCL has acquired additional land to operate the growing need of the firm , but all these will take certain period of time to create and deliver value to the business organisation. KPTCL decisions to enhance the transimission lines and increase the investment in survey and investigation have really been booming factor in the process of creation of effective service.

## 7. References

- 1) Aghion, Philippe, Robin Burgess, Stephen J. Redding, and Fabrizio Zilibotti. 2008. *The Unequal*
- 2) *Effects of Liberalization: Evidence from Dismantling the License Raj in India. American*
- 3) *Economic Review* 98(4): 1397–412.
- 4) Arocena, Pablo, and Catherine Waddams Price. 2002. *Generating Efficiency: Economic and*
- 5) *Environmental Regulation of Public and Private Electricity Generators in Spain.*
- 6) *Intemational Journal of Industrial Organization* 20(1): 41–69.
- 7) Bacon, R. W., and J. Besant-Jones. 2001. *Global Electric Power Reform, Privatization, and*
- 8) *Liberalization of the Electric Power Industry in Developing Countries. Annual Review of*
- 9) *Energy and the Environment* 26: 331–59.
- 10) Besley, Timothy, and Robin Burgess. 2004. *Can Labor Regulation Hinder Economic*
- 11) *Perfomance? Evidence from India. Quarterly Journal of Economics* 119(1): 91–134.
- 12) *Central Electricity Authority. 2007. Review of Perfomance of Thermal Power Stations 2006–*
- 13) *2007. New Delhi, India: Government of India, Ministry of Power.*
- 14) Chikkatur, Ananth P., Ambuj D. Sagar, Nikit Abhyankar, and N. Sreekumar. 2007. *Tariff-Based*
- 15) *Incentives for Improving Coal-Power-Plant Efficiencies in India. Energy Policy* 35(7):
- 16) 3744–58.
- 17) Chitkara, P. 1999. *A Data Envelopment Analysis Approach to Evaluation of Operational*
- 18) *Inefficiencies in Power Generating Units: A Case Study of Indian Power Plants. IEEE*
- 19) *Transactions on Power Systems* 14(2): 419–25. .
- 20) Fabrizio, Kira R., Nancy L. Rose, and Catherine D. Wolfram. 2007. *Do Markets Reduce Costs?*
- 21) *Assessing the Impact of Regulatory Restructuring on U.S. Electric Generation Efficiency.*
- 22) *KPTCL Manual and Reports*