

CHAPTER-1

INTRODUCTION

1.1 BACKGROUND

Power Distribution Utility in India is not a viable business due to huge Aggregate Technical and Commercial losses (AT&C)[1]. Although improvements were introduced in power sector after the commencement of Indian Electricity act -2003 by formulating new models and creating competitiveness but still business sustainability has not been achieved. For tenable growth and embellishment of power distribution business, both combinations of technical and associated administrative skills are required to be implemented.

A proper sustainability plan is required to efficiently utilize the available resources and assets. The plan was implemented to confirm continuous availability of quality products, for judiciously managing available assets and for system safety. Financial sustainability of a power utility is a standardized process for outlaying the requirements which might vary in accordance to its applicability. Power distribution business is required to classify research and implement best plan for wise distribution of power function. For choosing the most viable strategy, power distribution business needs to take into account various factors like work environment, nature of utility and work flow pattern. Over the last few decades, the power allocating business has not only geared up but also has received immense acknowledgement. Subsequently, several strategies have been formulated to support financial sustainability of the power utilities. The prime role of utility plan comes into play for regulating the quality, quantity and costs of electricity been supplied.

Key Issues in Distribution Sector

- High (AT&C) Losses disturbing commercial feasibility - National average of 26-27% vis-à-vis single digit in developed countries.
- Absence of Cost Reflective Tariffs - Lack of commercial principles.
- Huge Revenue Gaps for DISCOMs on account of Deferred Tariffs.
- Accumulated Distribution losses in 2010 : Rs 1,07,000 Cr ; Rs 2,45,000 Cr in 2012; Expected to increase to Rs 2,90,000 Cr by end of XII Plan in 2017. (*Planning Commission High Level Panel Report*)
- Power tariffs need to be raised by 47% for the DISCOMs to break even. (*CRISIL Report*)
- Limited or no competition in Distribution space despite Regulatory Framework.
- High Loss for SEB's
- Low Profit margins
- High AT&C loss
- Steep rise in Operational debt
- Regulatory Overhang
- Increase in Power Purchase Cost

High Loss of State Electricity Boards

Even after post reforms of electric power sector through unbundling of generation, transmission and distribution companies the financial loss levels of the utilities continue to be very high barring few utilities like those of Gujarat, Maharashtra and Kerala. As per the planning commission report, the utilities were facing a loss to the tune of 35% as of 2012-13.

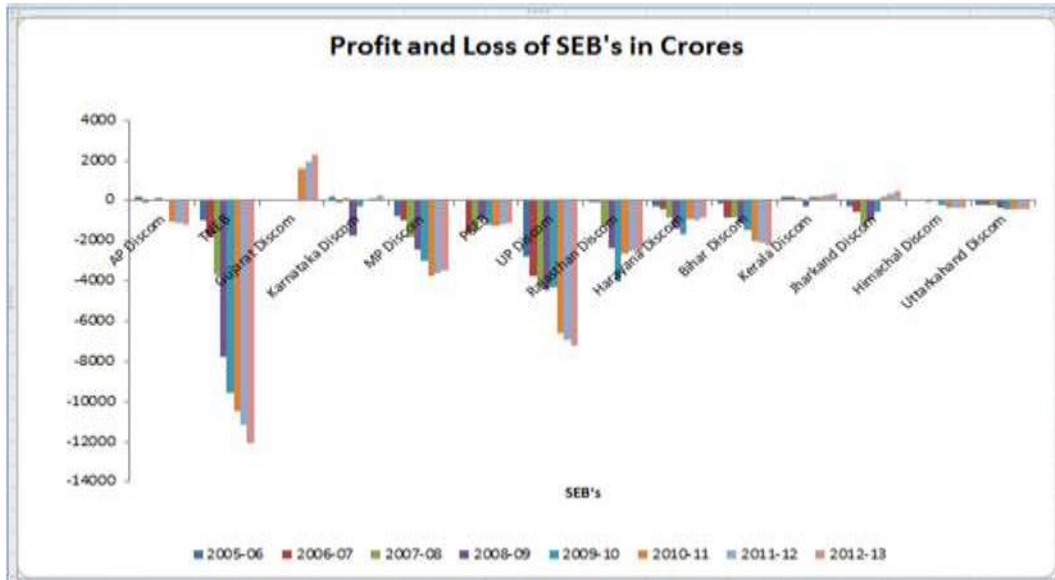


Figure 1.1: Profit and Loss of State Electricity Board's in Crores (Source: Planning commission High level report)

Few power utilities operating in private domain such as those in Delhi & Gujrat, and SEBs like Maharashtra are making profitable business but the profit margin with respect to the turnover is very low. Also, the operational debt of those companies are in the rising trend. This is not an encouraging sign for business sustenance of those power utilities in the long run.



Figure 1.2: Turn over vs. profit of Tata Power Delhi Distribution Ltd.

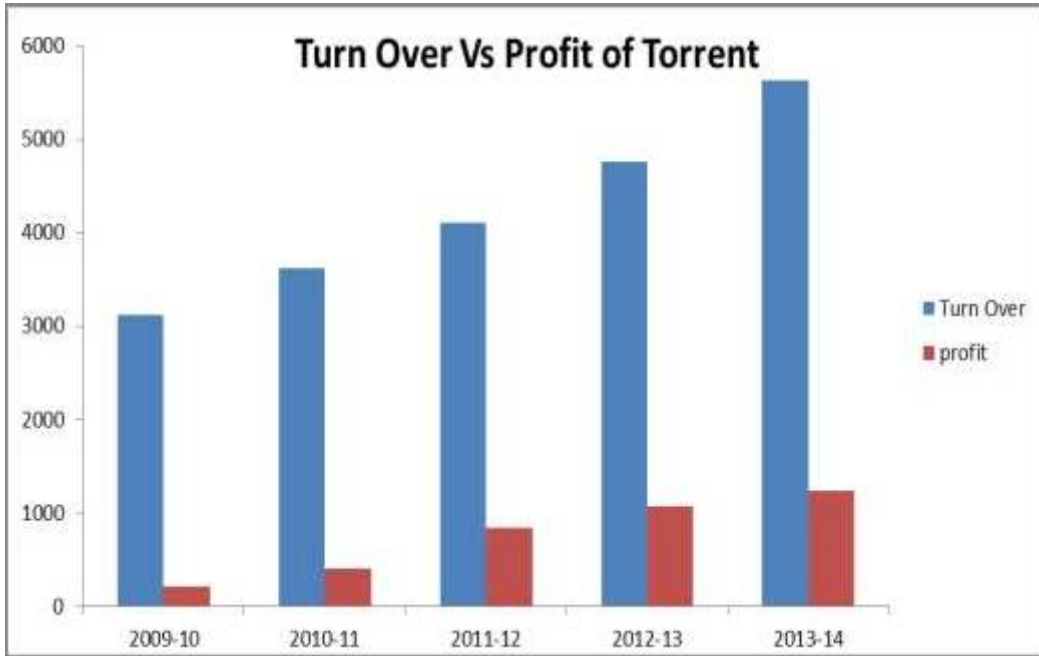


Figure 1.3: Turn over vs. profit of Torrent

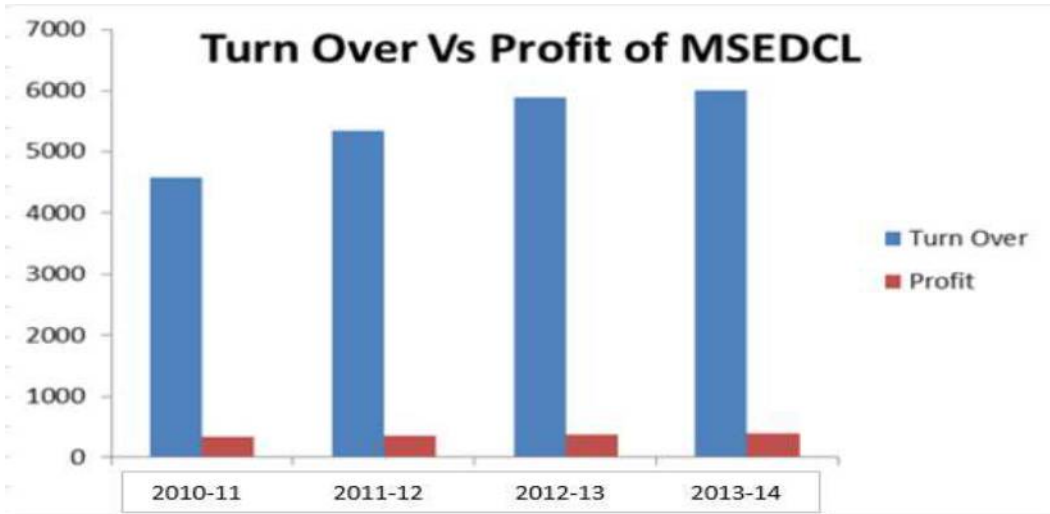


Figure 1.4: Turn and Profit of Utility (Source: Balance Sheet)

Steep Rise in Operational debt

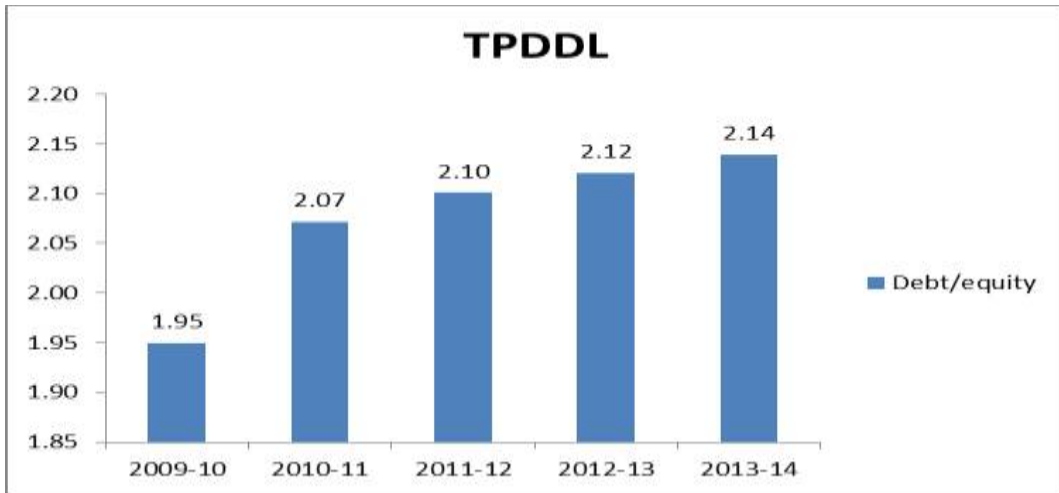


Figure 1.5: Tata Power Delhi Distribution Ltd.

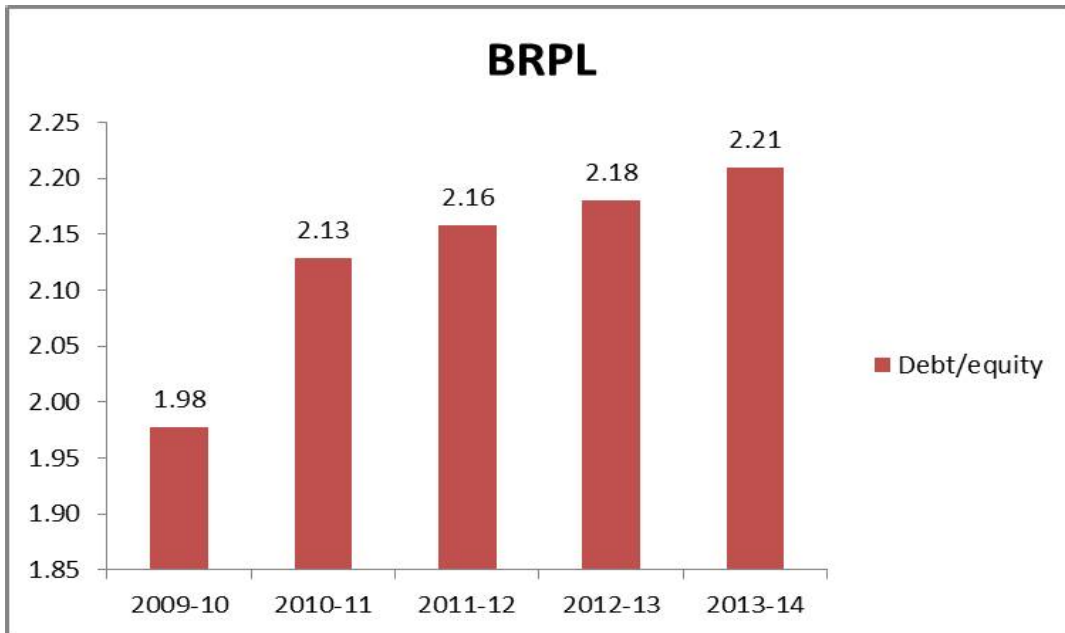


Figure 1.6: BSES Rajdhani Power Limited (Source: True Up Order DERC)

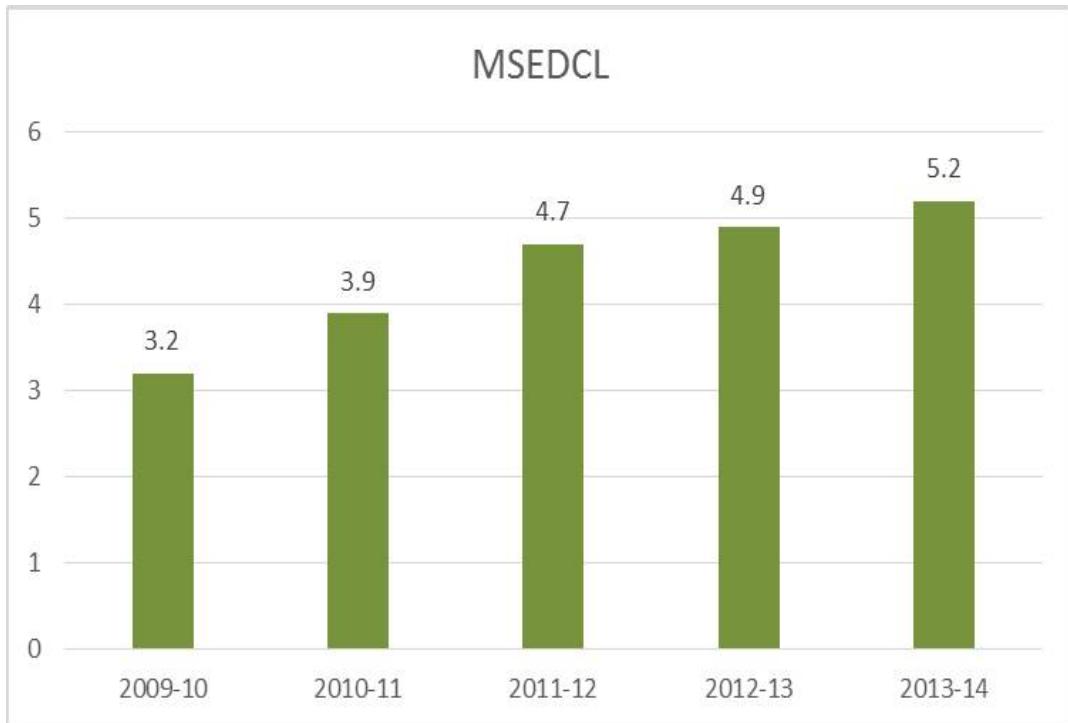


Figure 1.7: Debt/Equity Ratio (Source: True up Order MERC)

1.2 NEED FOR RESEARCH

The primary objective of this analysis is to identify interrelationships between factors affecting power utilities distribution system and develop potential solutions to help distribution companies overcome financial losses. Although there are large number of distribution systems existing in India, but still current reforms in India are not viable enough to fill the gaps between the required and available capacity. A new model with due care of following needs to be developed to ensure viable business entity with least financial burden on Government and wise distribution of power function. The study aims to create awareness that these bodies are facing in the current scenario and formulate strategies and policies to regulate the supply and simultaneously control the cost of power function. The prime objective of this study is to recommend strategies to improve the power infrastructure of the country.

1.3 BUSINESS PROBLEM

Most of the Power Distribution Utilities in India are making Losses. There is a need to identify areas influencing distribution business and develop strategies for sustainability of the same.

1.4 POWER DISTRIBUTION SCENARIO IN INDIA

The primary objective of analysis of is to enumerate and analyse the problems faced by power utilities and comparison of different prevalent models.

Power utilities in India are primarily involved in the distribution of electricity across the concerned area. There are a number of public and private organizations involved in it.

There are many companies emerging strong in Power Utility sector. But off lately the performance of the companies in this sector has not been up to the standards as it was expected. If we compare the performance of Power Utility sector in India from the period of 2009-2012, we will find that overall the sector is not flourishing in terms of financial stability. Some key points (PFC, 2013) covered for this sector:

Year	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Andhra Pradesh Distribution Utilities	183	-90	57	152	35	-1072	-1115	-1163
Tamil Nadu State Electricity Board	-968	-1826	-3693	-7783	-9378	-10462	-11200	-12037
Gujarat Distribution Utilities	58	90	38	32	65	1619	1937	2295
Karnataka Distribution Utilities	198	-23	122	-1717	-238	67	160	264
Madhya Pradesh Distribution Utilities	-741	-979	-1786	-2455	-3008	-3738	-3641	-3491
Punjab State Electricity Board	89	-1645	-1501	-933	-1151	-1263	-1199	-1112
Uttar Pradesh Distribution Utilities	-2772	-3765	-4207	-4424	-4308	-6584	-6926	-7231
Rajasthan Distribution Utilities	-30	-5	-1273	-2383	-4034	-2665	-2529	-2529
Haryana Distribution Utilities	-266	-403	-815	-1372	-1663	-941	-955	-852
Bihar State Electricity Board	-169	-856	-851	-1102	-1496	-2008	-2088	-2209
Kerala State Electricity Board	183	233	157	-311	192	210	278	354
Jharkhand State Electricity Board	-249	-345	-1214	-1000	-559	232	333	451
Himachal Pradesh State Electricity Board	56	79	-48	52	-209	-385	-370	-351
Uttarakhand Power Corporation Limited	-215	-209	-220	-355	-391	-412	-403	-391

Source: High Level Report on Financial Position of Distribution Utilities, The report was submitted in December 2011. Figures for periods beyond 2010-11 are based on projections made by the committee

Figure 1.8: Debt/Equity Ratio (Source: True up Order MERC)

- Net income excluding subsidy for utilities directly selling to the consumers increased by 17.36%

- The total energy sold by these utilities increased 7.57%
- The total subsidy registered by utilities directly selling to the consumers increased by around 30%. Subsidy registered as a percentage of revenue from sale of power increased from 10.93% to 12.49%
- The subsidy discharged by the State Government has been about 85% of the reserved by the utilities.
- The aggregate book losses of all the utilities was improved by almost 70% and 20% from Rs.30,430 Crs. in 2009-10 to Rs. 51,602 Crs. in the year 2010-11 and to Rs. 62,581 Crs. in 2011-12 respectively.
- The aggregate losses for all utilities were augmented from Rs. 64,463 Crs. in 2009-10 to Rs. 74,291 Crs. in 2010-11 and to Rs. 92,845 Crs. in 2011-12.
- The losses on subsidy received basis on an aggregate basis for all utilities were enlarged from Rs. 45,382 Crs. in 2009-10 to Rs. 53,986 Crs. in 2010-11 and to Rs. 67,006 Crs. in 2011-12.
- The book losses for all the utilities in the states as well as UT of Puducherry as a ratio of aggregate revenue (excluding subsidy) increased from 22.56% in 2010-11 to 23.31% in the year 2011-12. Similarly, the aggregate losses on subsidy received basis increased from 23.60% in the year 2010-11 to 24.96% in 2011-12.
- Utilities in 19 States and the UT of Puducherry have shown deterioration in book profits/increase in book losses during the year 2011-12 over the previous year 2010-11 on an aggregate basis, amounting to Rs.16,035 Crs.
- The net worth decreased from Rs.14,973 Crs. as on 31st March 2010 to Rs.5,314 Crs. as on 31st March 2011. The net worth has become negative to Rs. 31,812 Crs. as on 31st March 2012.
- The overall AT&C losses (%) for utilities selling directly to consumers increased marginally from 26.04% in the year 2010-11 to 27.00% in 2011-12. [2]
- There is also a steep rise in the operational debts of PPP model power utility due to non-availability cost reflective tariff resulting in regulatory overhang.

Thus we can see the financial variation for the Power Utility sector in India with almost all the state utilities and private utilities booking losses for their distribution.

Does this call for a better Power Utility model to be implemented in the states or does it call for more financially sustainable practices in India.

1.4.1 STUDY OF DIFFERENT POWER DISTRIBUTION UTILITY MODELS

State Electricity Boards (SEB)

The traditional electricity sector of India was controlled and governed by state-owned suppliers. But post-independence era witnessed the participation of private sector in the similar industry. Many foreign players were striving to make a move into this particular segment to increase the power capacity of the whole country. Post-independence reform in 1948, enforced the registering of electricity as a simultaneous subject by formally dividing the legislative authority between the Centre and States. Central Electricity Authority (CEA) and of State Electricity Boards (SEBs), were formulated as the two prime agencies regulating the supply of power in India. SEB's are self-governing bodies, liable for generating, transmitting and distribution electricity in an efficient and economical manner. Low labour productivity, high system losses, lack of ability to fulfil electricity requirements of large proportions of population, poor quality of service been delivered and inadequate tariff charges are few of the reasons behind inadequate performance of SEBs.

- The strengths for this model are Government owned regulations, direct under policy makers, mandatory for people to use them
- The weaknesses in this model are poor service quality, inadequate investments, low labour productivity, high System Losses unavailability of services and inadequate pricing
- The opportunities in this model are huge investment potential, asset diversification, resource utilization and scope on non-core areas

- The threats had been negative attitude of employees, very dismal response of authorities towards any innovative activity, lack of vision might not get right policies in place

Franchise Model

Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY), scheme implemented by Government of India aims to fulfil the electricity requirements of rural people. It is a prerequisite for revenue sustainability and management of rural distribution. Under this scheme, franchisee is responsible for generating and distributing electricity into a particular defined region for a specified duration, under the governance of policies lay down by the government and in return collect revenues directly from consumers.

The various franchisee models visualized under RGGVY range were formulated with an intend to perform business functions like revenue collection, bill generation, grievance handling, assisting with release of new connection and providing appropriate feedback to the utility to development of rural electric cooperatives and their management through contracting. There is also an Input based Franchisee model under the RGGVY. Under this scheme, franchisee purchases the electricity from the provider at 11KV feeder level for which it pays certain pre-determined charges. The franchisee's main job is to then raise bills and collect revenue from all the consumers to sustain its commercial operation.

The Distribution Franchisee model as implemented by Maharashtra State Electricity Distribution Company (MSEDCL) in its Bhiwandi circle is the latest model in distribution sector reform process. An arrangement of such kind enabled private company to cope up with the distribution function without undergoing any fundamental organizational or legal change. Certain unique features of this kind of arrangement includes indexing the revenue of the licensee to changes in tariff, little or no financial support from the licensee and use of input rate as a bidding parameter. [3] Because of its tendency to incur very little or no technical or commercial losses, this model is the most viable and demanded model in the distribution sector. And as a result of rising

interest amongst the distribution sector, many states are planning to implement this model. Consequently, consumers are facing problems of fast running meters and rising bills on account of adoption of this model. Several court cases have also been filed on various issues related to the model in case of Bhiwandi as well as Nagpur, the second city where MSEDCL intended to implement the franchisee model.

The franchisee can be successful in rapidly reducing AT&C losses, but that may not necessarily imply large benefits to the licensee, as in case of Bhiwandi, actual increase in licensee's revenue compared to pre-franchisee year is not significant. This is due to the fact that, post appointment of franchisee, licensee's revenue is largely determined by the input rate quoted by winning bidder and the Average Billing Rate (ABR) for particular year. During the first year of the post franchisee period (FY 07-08) ABR has dropped by about Rs. 0.60 / unit compared to previous year (FY 06-07). This has resulted in drop in licensee's revenue by about 3%. This underscores the sensitivity of licensee's revenue to the ABR. Similar to ABR, licensee's revenue is also highly sensitive to sales to subsidized consumers and subsidy claims from the government. One of the important shortcomings identified through this study is lack of post-franchisee monitoring by licensee. Realizing the importance of ABR and subsidy, the franchise agreement stipulates certain process and timeline (quarterly and annual) for undertaking audits of ABR, subsidy claims, metering and billing systems / database etc. Unfortunately, even after two years, none of these audits have been completed as yet. The audit of metering and billings systems has not even started.

- The strengths of franchisee model have been managed by private companies without any fundamental structural & legal changes, rapid reduction in commercial and technical losses.
- The weaknesses has been lots of consumer complaints over high bills and fast running meters no legal or structural authority with the franchise partner and regulatory measure controlling is not good.

- The opportunities in this model are lots of companies are investing in this model, safe and secure mechanism to outsource the billing mechanism; loss reduction can be further enhanced.
- The threats for this model are SEBs may not able to work with fast paced private companies in outsourcing the work, with lesser margins; franchise model may not work on its setup.

Public Private Partnership (PPP)

PPP models not only aims to reduce technical and commercial power losses but also intends to eliminate the problem of power cuts in India. The model was designed to bring in distribution tariffs to an affordable range. After successful implementation of model for commercial use like airports, roads, ports and flyovers, government is planning to integrate the same approach into the entire electricity distribution scheme of the country under support and guidance of B.K.Chaturvedi. In order to assemble sources of investment for PPP model Union Government seek for support from several financial institutions. The component of flexibility was incorporated to the rigid structure of PPP model, thereby allowing the model to acquire anything and everything they require from market at competitive prices. PPP model acclaimed for 25 years of concession period. To ensure quality supply, the subgroup also acclaimed for open access to consumers wherein, the company is allowed to select the particular distribution area for themselves and billing mechanism to accommodate changes in the pre-determined system of incentives. Key performance indicators are standards for measuring success and confirming reliable supply to the consumers.

From the opinion of subgroup, neither Franchisee model nor privatization model would deliver the anticipated result. A well-formulated PPP model is the only path to success for power sector in India. PPP model is aligned with the Electricity Act 2003. [4] The Act proposes that it is mandatory for distribution network to take approval from the state electricity regulatory commission (SERC) for ensuring consumer protection. The concession period of 25 years is aligned with the provisions of Electricity Act, 2003. The

subgroup can seek for further extension of concession period up to 10 years from SERC, on the terms stated in the concession agreement. The concessionaire is only allowed to operate the distribution network business. But the hold of distribution assets still remains in the hands of government. The extent to which concessionaire is permitted to make use of distribution assets is governed by the laws compiled in the concession agreement. The power purchase agreement (PPAs) conveyed to the concessionaire for supply of electricity to the regulated consumers is stipulated by the concession agreement. The concessionaire after receiving approval from SERC can add to its existing power distribution capacity by entering into PPAs. All consumers other than open access consumers are liable to pay tariff for the electricity they receive in addition to fixed wheeling/distribution charge. For open access consumers, supply tariff is settled mutually between the consumers and suppliers, in conformance with section 49 of Electricity Act, 2003. According to provisions postulated in concession agreement, the distribution charge collected from open access consumers will be almost equal to the distribution charge collected from regulated consumers.

Stimulation of PPP in the power sector will require a pro-active approach from the project sponsors, particularly the State and the central Government. Some of the key constraints from the recent attempts in developing power projects on PPP mode include:

- Issues relating to acquisition of land
- Lack of standardized documents leading to diverse interpretation of issues at the states (lack of knowledge of available standardized documents)
- Liquidity crunch
- Arbitrary norms of pre-qualification primarily adopted by state entities
- Inability to meet deadlines by the state entities while executing project development activities
- Issues relating to human resources and trained manpower.
- Others

- The strength of the PPP model is Customer Satisfaction, technology leader, established brand name, process centric organization
- The weakness are unification of diverse culture, destruction of worthy manpower and restricted progress in authorized business
- The potential prospects are exploiting the available assets to full potential, diversification, utilizing the advantage available in non-core business areas, ability to offer low tariff to special consumers
- The threats associated with PPP model are regulatory uncertainty, politically sensitive business model and possibility of losing high value customers.

On the whole, all the models suffer common problem of Financial Sustainability which must be addressed soon.

A new model with due care of following needs to be developed to ensure viable business entity with least financial burden on Government.

- a) A transparent clause of Asset and employee transfer
- b) Provision of ownership
- c) Freedom in terms of Investment and Power Purchase
- d) Least influence of Regulator
- e) Legal Protection from Financial Anarchy like subsidies.

1.4.2 POWER DISTRIBUTION CAPACITY AND ITS PERFORMANCE IN INDIA

Power is an inevitable necessity for a developing economy like India. For continuous growth and development of the country, it is important that power infrastructure of the country is up to the mark. Until now, India has fifth largest generation capacity in the world and is also the sixth largest electricity consumer. [5] The country accounts for approximately 3.4% of total global power consumption. To meet the ever-increasing demand of power, both for residential and commercial usage, Indian government is encouraging many private foreign players to make significant contributions in power projects, to

enhance the overall distribution capacity of the country. These private players are expected to make a contribution of approximately 45 GW of power. That is privately players are anticipated to make a contribution of 55% to total power capacity of the country. Central government is forecasted to add approximately 21.4 GW of power to total power capacity of the state and several state agencies are expected to add 15.2 GW of power. With a motive to increase the transmission capacity of the country, the government is not only supporting but also making huge investments into power projects to increase the capacity of transmission lines for meeting the ever increasing demand of electricity and supply the same in power deficient regions of the country. The inter-regional capacity of transmitting power which was 28GW during the 11th year plan is anticipated to increase to 66 GW during the 12th year plan. Government is planning to install 110,344 circuit transmission lines by the end of 12th year plan. Restructured Accelerated Power Development &Reforms Program (R-APDRP) was launched to control and regulate power losses during its transmission.[6] Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY), aims to adopt distribution pattern such that all those who are deprived of receiving power function, easily have access to such facility.

1.4.3 POWER SECTOR REFORMS-2003 IN INDIA

The Indian power industry was governed by Electricity Act, 2003.[7] The act was established to create a legal framework for the continual growth and development of power industry, controlling electricity tariff, protecting both consumer and supply interest and promoting competition. The act combines all possible amendments to be made in the existing laws of electricity. Generation of power function has been relicensed, whereas captive generation is been freely exhilarated and legalized. The Act liberalized the additional charges that were earlier been imposed on private players, encouraging them to distribute or sell electricity to any consumer in surplus. Much of attention was paid on development of transmission network. The act came up with measures to augment the performance of distribution network to overcome the losses that traditional power sector was bearing on account of transmission. The act introduced distribution license to allow, which allow several

distributors to join hands with each other to distribute electricity in cooperation. The act was implemented with a motive to set performance standards for distributors to measure their success and development. Unbundling of State Electricity Boards is yet another important characteristic feature of the reform. *The Electricity Act 2003 states that, “the Central government shall, from time to time, prepare the national electricity policy and tariff policy, in consultation with the state governments and the authority of development of power system based on optional utilization of resources such as coal, natural gas, nuclear substances or materials, hydro and renewable sources of energy.”*

1.5 ORGANISATION OF THE REPORT

The report is divided into six chapters. **First chapter** summarizes the power distribution reforms and several utility models implemented in India. This analysis helps in diagnosing strengths and weaknesses of different utility models. The report entails a brief about amendments made in power sector reforms after the implementation of Electricity Act in the year 2011. The report basically aims to bridge the gap between demand and supply. [1]

Second chapter basically aims to create a background for the research. The section basically provides in-depth knowledge of changes in power sectors that has taken place over a long period of time. An analysis of global power sector reforms was studied to identify loopholes in the Indian scenario. Power distribution utility models were compared to identify the best possible model as in the case of India. The available literature is organized on the basis of different themes. These themes are nothing but factors governing the performance of power sector. The main idea of literature is to have a gist on the present scenario, so that our research could focus directly on the problem area and come up with most optimal solution.[8] Trends in power sector of several global economies like China, Chile, Argentina, UK etc. is discussed in brief.

Third chapter clearly states the problem statement and the objectives that study aims to investigate. This chapter provides a systematic way to deal with a particular problem. Exploratory research methodology was used in our

research study. Initially factors were identified and then quantitative analysis was carried out to find sustainable strategies for power sector in India. The 5-point Likert based questionnaire was used to collect the feedback of the people working in power distribution utilities.

Fourth chapter explained how power evolved in India, the problems faced by power sector of India.

Finally quantitative analysis technique was conducted in the **fifth chapter to discover factors** influencing the business sustainability of power utility business. Several strategic management tools like IFE, IE and EFE were used to analyse working conditions and strategic position of power sector. Finally, suggestions were made to help power sector sustain in the longer run. Also summarizes both internal and external factors affecting the power distribution utility business.

Finally the **last chapter** enlists the gaps that the study was able to address. Recommendations were provided to help TPDDL formulate strategies to help it overcoming transmission and financial losses.

1.6 SIGNIFICANCE OF THE STUDY

High distribution tariffs, power cuts and thefts, tax governance, pervasive political interference are some of the reasons behind the fragile power structure of the country. Apart from improving capacity, Indian distribution network requires extensive reforms and strategies, to provide electricity to the large un-electrified population of the country. The study aims to compare different models of power utilities models in India. The current distribution network is unable to address the deficit and ever increasing demand of electricity. The distribution companies in India were facing huge financial losses. The distribution companies in India are largely financed by commercial banks. This has severe effect on sustainability of the electricity sector. The study aims to identify best power distribution model for India. The study aims to identify loop holes in the existing model, to help power sector accommodate the changes in the existing model to overcome the gap between the expected and actual performance. Technology up gradation, Capacity building, business prospects, political prepositions, employee contentment etc.

are some of factors influencing the business sustainability of power utility business. Finally, the study aims to recommend strategies such as integration of renewable sources etc. to scale up the power generation capacity of power sector.

1.7 CONCLUDING REMARKS

The first chapter introduces about the problem and motivation for the study. It basically provides a roadmap for the rest of the succeeding chapters. It also outlines specific objectives of the study. The chapter highlights the motivation that encouraged researcher to carry out the study. The introduction sets out a background for carrying out a research further. The section discusses about Power Distribution scenario in India and several power distribution models currently been used in India. The analysis of power distribution model helped in discovering most suitable model to be implemented for mixed economy like India. Power distribution capacity and its performance in India is talked about.