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Project Dissertation Report on

"Study and Analysis of Tariff Rationalization in Delhi Distribution Sector"

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CERTIFICATE

This is to certify that Neeraj Singh, Roll No: 2K18/EMBA/520, student of Masters of Business Administration (Executive 2018-2020) at Delhi Technological University, Delhi has accomplished the project titled "**Study and Analysis of Tariff Rationalization in Delhi Distribution Sector**" under my guidance and to the best of my knowledge completed the project successfully, for the fulfilment of the course Executive MBA.

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ACKNOWLEDGEMENT

I wish to express my deepest gratitude to **Prof. P. K. Suri** for his valuable advice, guidance and continuous support throughout the project work. The successful completion of this project owes its merit to the inspiration and encouragement given to me by him.

I would also like to acknowledge the vital role of my present organization **Tata Power Delhi Distribution Limited (TPDDL)**, in providing me with sectorial insights into the Power Distribution Model.

I would also wish to express my gratitude to my family members, my batch mates & all the teachers of the EMBA course at DSM for their continuous support, which enabled me to take up the MBA (Executive) course.

DECALARATION

I, Neeraj Singh, student of EMBA 2018-2020 batch of Delhi School of Management, Delhi Technological University, Bawana road, Delhi, declare that term project "**Study and Analysis of Tariff Rationalization in Delhi Distribution Sector"** submitted in partial fulfilment of Executive MBA program is the original work conducted by me.

The information and data given in the report is authentic to the best of my knowledge.

This report is not being submitted to any other University for award of any other Degree, Award and Fellowship.

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EXECUTIVE SUMMARY

An electrical utility, whether public or private, functions in dynamic environment of the society. In social, financial, technical and governmental forces can't be meticulous by the discom. The discom has control only its internal atmosphere as system and process only. To maintain the equilibrium condition b/t the internal and external environment through regular improvement in process and reforms. For a utility in electricity tariff finalization is complicated process and its remain the survival strategy of utility to maintain the actual requirement of tariff hike with the help of regulator approval. The identification of actual cost of supply for electricity services, is a complicatedand not easily possible in current scenario, which also create a serious impact on Power industry. The electricity service sector is intangible in nature, it can't be easily measure characteristic or satisfaction of customer demands.

For a utility identification of output is critical in terms of cost parameters. The electricity is service industry, pricing is a main part of decision making in power sector. The mostly customers avail the services but as per mind set of customers it is free of cost. So that the AT & C losses in power industry increased day by day. The economic theories undertake that commercial organization main objective of maximizing their profits.

The organization management also bother about which quality of services be served to consumer in whatever amount. A municipal and private segment organization is predicted to pursue for profits with enhancement of consumer growth, reliability, customer satisfaction, advance technology implementation and social resources growth. As per the multiple objective of discoms is to be harmonized with one another with also improvement of commercial and financial viability of the discoms. The availability of resources are limited and customer and technical problems both are compiled in strict regal regime which are also create a problem for discoms. In Indian states mostly discoms are not provide reliable supply because loss component is huge and it is not fulfill the customer demand as per EA'2003.

Apart from this, the planet is facing severe challenges in energy sector. The worldwide economy is about to develop fourfold within the next 40 years, which potentials economic benefits and big enlargements in people's standard of living. But it also indicates a far greater consumption of electricity. A worldwide revolution is critical within the ways in which electricity is generate, distribute and used. This report is a shot to know the Business Model of an influence Distribution Company (DISCOM) by studying the "Annual Revenue Requirement (ARR)" of Tata Power-DDL and analyze the financial constraints of the Power Sector in terms of privatization model and studying the Delhi distribution sector to look at the method of tariff finalization and gaps. In Delhi various steps are taken by the GoNCTD and was to bring out a reforms strategy on Power Sector in Feb. 1999. They had published a unique reforms and model which help the Delhi customer base and improved the reliability of power. The new reforms act that ultimately resulted within the unbundling of DVB and privatization of electricity distribution segment, generation segments and transmission with effect from 1st July 2002. As a results of CERC reforms act, all SEBs are directed to unbundle in three segments viz. Generation, Transmission & Distribution. Due to high AT&C Losses in Distribution Sectors, reforms activities are being focused for Distribution Sector by adopting privatization and franchising model of Distribution Sector.

The wattage sector is consists of three main segment named as,

1.Generation,
2.Transmission
3.Distribution

For Generation of electricity in many Public Utilities are exist as i.e. NTPC, NHPC, SJVN, SECI, Torrent, and DVC, NPCIL. The generating sector are contain partnership of public sector or private sector. The fuel allocation are depend the generating station governed by private or public.

In India transmission egment is governed by Central govt. utilities i.e. PGCIL. To Govt. utility

ransmit the electricity supply from the generators to Distribution Company's entire India is divide India into five zones/regions i.e.

1.Northern
2.Southern
3.Eastern
4.Western
5.Northeastern

Further additionally within every state, there's SLDC (State Load Dispatch Center) to manage the transmission of electricity in states. The distribution network is principally disbursed by DISCOMS and SEBs. With Delhi privatization model, many nations have followed et al. are within the process of privatization with the most aim to serve the consumers in an exceedingly better way and reduction of AT&C losses. State Regulator targets are set to decrease AT&C losses for a specific period of your time while maintaining the performance standards regarding Power Quality and consumer related services. In abovementioned scenario and constraints, it's of major importance to create efficient, effective and optimum forecast or an estimate of the particular revenue requirement by the DISCOMs which is employed by the SERCs to spot the tariff to be paid by the retail consumers of Power. once a year DISCOMs need to submit ARR to SERC within which total cost, capital Therefore, the components of the ARR should be precisely calculated and logically formulated and therefore the plans identified should be implemented with ultimate control so on achieve the inducement as visualized in ARR & avoid the dis-incentives and gaps related to the identical as laid out in the orders of SERC regarding tariff or others.

Scope of study contains the Tariff component of Tata Power-DDL & its financial components & the Delhi Power Sector Reforms & related Financial Model. All the references are drawn from the Delhi Power Sector Model & TPDDL because the data for the identical is accessible. Delhi Model is taken into account to be a successful implemented Power Sector Privatization Model in India & across the planet which happened through the

route of venture (JV) between the govt. of city Territory of Delhi (GoNCTD) & the private players under the aegis of Delhi Electricity Regulatory Commission (DERC). The supportive Financial structure just after privatization that helped in sustaining the arrangements by the private parties & taking it further to cut back losses & setting the instance of efficient management of Power Distribution has been studied.

Studies have flagged several issues

- Recovery less than the actual cost of supply through fixed charges in tariffs and the fact that the tariff does not reflect the costs of supply

- Cross-subsidy charges levels for mostly discoms still not within the boundaries as per the EA and therefore the NPT.

- While un-electrified area domestic consumers are being electrified, USO and DBT are main strategically concern area and improve the reliability of system

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In this chapter provides the detailed information on the Power Sector Reforms from the Financial Perspective & the corresponding actions taken by Government & Policy makers.

4. Delhi Power Sector Model

This chapter provides the detailed information on the Delhi Power Sector Model along with the privatization process involving the financials etc.

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This chapter explains in brief the tariff policy and valuation model, recommendation for determination of Tariff.

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This chapter explains important concepts in finalizing ARR and hence the tariff.

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This chapter explains How DERC and the utilities together interact to finalize the tariff.

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In this chapter we discussed about brief introduction of Power DISCOM under study i.e. TATA Power Delhi Distribution Limited.

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In this chapter the components of a ARR of a typical DISCOM, TPDDL in our case, will be discussed in detail.

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Finally the entire study will be summarized in this chapter with specific conclusions.

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CHAPTER-1
INTRODUCTION

1.1 PROJECT OBJECTIVE

The Indian electricity segment is the spine of Indian economy which is play most vital role of the all-round growth of the economy of the country. An estimate of Honorable Planning Commission projects that if the Indian Economy were to grow at the rate of 8% and above the Indian Power Sector is required to grow at the rate of 9-10% & above. Presently the pace of growth is very slow & prior to the “global meltdown” that occurred in 2007-08, the Indian Power Sector grew at barely 4.5-5% and has actually gone down since then due to recession at 3.5-4%. Notwithstanding the same the Power Sector is slated to be one of the utmost quickly growing sector and is having huge possibilities of future investments and expansions in terms of Green or brown field projects involving both organic & inorganic growth across the nation.

There are around 29 State Electricity Boards (SEBs) in India & almost all have initiated their attempt to bring in Power Reforms. The proposed study will help those SEBs as well as private players in Power Distribution to excel in their power distribution business by reducing the AT&C Losses. Today national average of Commercial Losses is around 31.8% i.e. around Rs. 24,000Cr every year. More than 45% of SEBs have Commercial Losses more than national average and are practically insolvent. Apart from the losses almost all the states are also plagued with the continuous apathy of the respective managements towards the power network improvement & augmentation resulting into huge interruptions of the Power Supply even in the big cities such as Delhi, Mumbai, Kolkata etc. Any immediate step to improve such situation cannot be taken & the sustained political will is needed for such a large scale improvement. In such scenario it is very important that a model or a standard of Power Sector model be set that takes into account the involvement of the private sector parties as well as provide a framework that amalgamates the interest of the consumer, improve the regulatory environment as well as providing a conducive regulatory & legislative

environment with accountability.

Our Project study is going to **study the Power Distribution Sector** which is the most plagued of all the problems as mentioned above. We will examine the impact of all of the above & come up with insights so as to highlight the basic steps that need to be taken to make any Power Distribution Model financially viable as well as the monitoring aspect to make the same accountable. **Focus of the study shall be on the financial & commercial perspective which is the most important through which all the experiments that have been implemented or envisaged for reforms or improvements are ultimately to be financed.** This will ultimately help Government & people in India to reduce the burden of power losses.

- To examine the prevailing Regulatory framework in Electricity Retail Tariff and develop a strategy and mechanism for creating Competition in distribution sector within the existing frame work
- To examine the present Tariff Structure of DISCOM Electricity Tariff
- To examine the financial viability of distribution model
- To examine the complex tariff structure and how the tariff structure can be rationalized
- To examine the ACoS of Distribution sector
- How to minimize the Regulatory Overhang
- To empirically assess the domestic power distribution sector and study the OA consumers, is not viable in current scenario i.e. non-utility consumers in power distribution

1.2 METHODOLOGY

This paper is analyzing the Tariff of Delhi. Based on the data it is observed that the tariff structure is required to be more transparent, simplified and uniformity should be maintained to give suitable tariff hike so that unnecessary burden on the consumers can be stopped.

The business environment of Power DISCOM is analyzed with focus on challenges to bring

in Power Reforms. Established processes for formulating ARR & its components.

The research study is based on actual data from the different SERC tariff order, Regulations, company, site visits, and interviews with various officials involved in the process and informal meetings.

Secondary data is collected websites of various Government Authorities, Regulatory Sites as well as TPDDL, Power Sector Magazines, Various library books etc.

The subject report is concerned with Tariff Rationalization, basically related to case study of Tata Power DDL. Accordingly I have submit the works pertaining to Tata Power DDL limited, which includes study of Power Sector reforms and Tariff Model implemented first time in India. Study the flaws in Power Sector Reforms and regulations, which create huge amount of overhang and financial viability of discoms. We also study the AT & C impact in Delhi privatization model in current scenario and compare the AT & C loss in all three discoms operating in Delhi and also calculate the 1 % of AT &C loss impact and amount.

The research study focused on Tariff determination process and its complication. The primary raw data is collected from TPDDL site regarding billing, input energy, peak load, collection amount and sales. Based on the Primary data we are forecast the Sales, consumer growth, load growth and collection growth with the help of quantitative forecasting method.

There is the seasonal variation of Sales and Collection growth and we are identify the gap in projection figure also.

I also made telephonic discussion with Tariff determination problem in different utilities in Indian Power Sector, as per current scenario physical meeting or interaction is not possible due to COVID Pandemic. As per discussion with different utilities the finding/ anomalies in Power Sector tariff process also mentioned in Tariff Rationalization chapter.

I also prepare a Tariff Modelling for different utilities and compare the current tariff slab and categories. Based on tariff modelling I had made suggestion of tariff structure which is more complex, due to complexity of tariff structure the compliance part is also typical. The complex tariff is so difficult to understand by the stakeholders and utilities because multiple category

and slab in existing tariff structure resulting the same could not be complied which create a legal complication. Due to these complication the discoms are not getting the actual tariff for which they are entitled.

I also study the gap b/t ACoS and actual realization cost. In different category shows the positive gap means Supply cost less than the realization cost and some categories shows negative gap. As per my study Average Cost of Supply is not favorable in all categories. The calculation of cost of supply based on each category instead of average of all consumer base.

Based on the case study I had made varies recommendation which might be help to the TPDDL or other discoms, the same could be acceptable by regulators.

In concluding para, I would like to mention that the study made by me is based on tariff anomaly in power sector. Delhi privatization model is benefited by consumer segment due to power supply reliability but discoms are still facing the huge overhang, as on date which est. 8000 cr. The reforms shall be transparent and cost reflective tariff is as per my recommendation.

Hope the study made by me is very effective in favor of discoms and as well as consumers.

1.3 Concluding Remarks:

This chapter focus the objective and methodology of study. This chapter define the anomaly in power sector. The next chapter focus on the brief of Power Sector.

CHAPTER-2

Indian Power Sector-A Brief Overview

2.1 Brief History & status of Indian Electricty Sector

1910: First Indian Electricity Act Passed

1948: Electricity Supply Act Released after independence (Power Sector Development by SEB)

1975: Electricity Supply Act amended for Central Government‟s intervention to develop Power Generation - Inception of NTPC, NHPC

1991: Electricity Supply Act amended for private sector participation in Generation – Attractive ROI, Tax Exemptions, 100% Equity participation, incentives on high performance

1992: PGCL formed out of NTPC to develop Transmission Lines & National Grid

1998: Regulatory Commission Act passed – CERC & RC for states formed

2003: Indian Electricity Act (1910), Electricity Supply Act (1948) & Regulatory Commission Act (1998) INTEGRATED with following major highlights –

- Electricity Generation Free in Licensing
- Mandatory role of RC in granting license for T&D, tariff, competition promoting, dispute setting
- CEA Role redefined
- All Supplies are to be metered
- Progressive reduction in cross subsidy
- Stringent penalties against theft
- Reorganizing the SEB

2.2 Indian Power Sector Structure

The Indian Power Sector is governed by various bodies, some are directly under Government, Central or State, control and others are independent bodies. The policies & legislations in the Power Sector are finalized & enacted by the Ministries & departments of Power at both Central & State Level with the help of Central Electricity Authority (CEA). The sector is regulated by Central Electricity Regulatory Commission (CERC) & various SERCs. Central Government Companies such as National Thermal Power Corporation (NTPC), SEBs, & Independent Power Producers (IPPs) & other Generation Companies private or otherwise generate power which is then transmitted with the help of Central Transmission Utility (CTU) which is Power Grid

Corporation India Limited (PGCIL) and other State Transmission Utilities (STUs). Distribution & retail supply of Power is done by the SEBs & other private of Joint Venture DISCOMs.

Indian power sector has changed significantly over time & utilities are restructured with solid regulatory foundation, increase in public participation in tariff setting and reduction in tariff distortions.

The total installed capacity stood at 3,46048 MW as on 12th Nov 2018 making India among the largest countries in terms of generation.

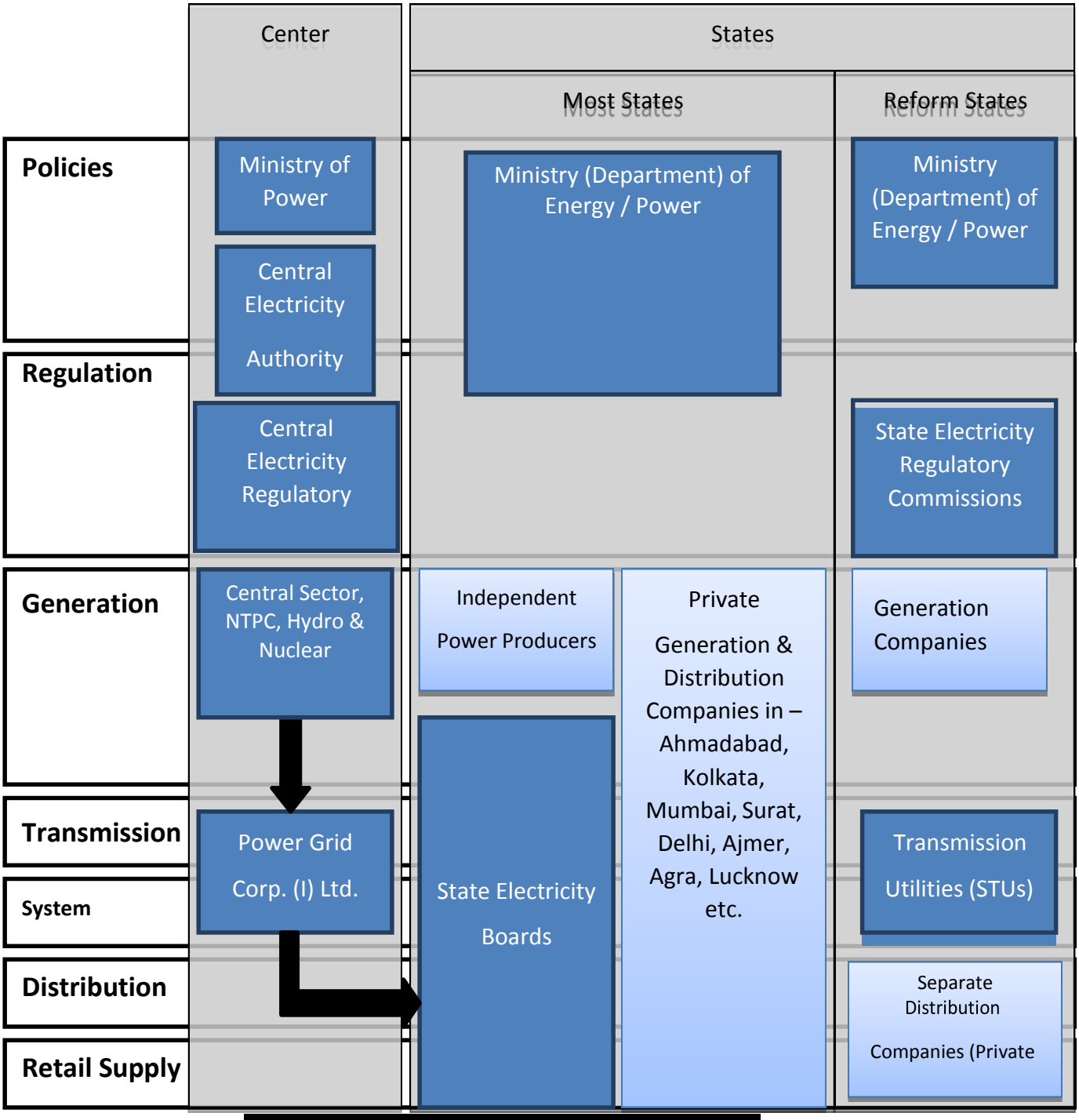

Figure – 1 Structure of Indian Power Sector

Fig.1 Source: Central Govt. unbundling Reforms structure consist in reforms act

2.3 Power Sector – Regulatory Framework & Policies

Electricity Act 2003

Enactment of a single unifying Electricity Act, 2003 has provided a liberal and progressive legal framework in the electricity sector.

As per the Electricity Act 2003 –

- constitution of State Electricity Regulatory Commission (SERC) by the States
- SERCs are responsible for fixing tariff for electricity
- SERCs are to notify regulations for open access of distribution network

States are required to set up consumer grievance cells and appoint an ombudsman for protecting consumer's interest. The Act encourages competition by way of provisions for de-licensing of –

- Generation
- Open access to transmission
- Phased open access to distribution networks and
- Recognition of power trading as a distinct activity
- Provisions of handing over electricity distribution to franchisees.
- providing a legal framework for making theft of electricity a cognizable offence

Electricity (Amendment) Act, 2007

The Electricity Act (Amendment), 2007, amending certain sub regulations of the Electricity Act, 2003 has been enacted on 29.05.2007 and got into force w.e.f 15th June, 2007. The features of the Amendment Act'2007 –

- Central Government, jointly with State Governments, to provide access to electricity to all areas including villages and hamlets through rural electricity infrastructure and electrification of households
- No license required for sale from captive units
- Deletion of the provision for elimination of cross subsidies while the provision for reduction

of cross subsidies would continue

• Definition of theft expanded to cover use of tampered meters and use for unauthorized purpose

• Theft made explicitly cognizable and non-bailable.

National Tariff Policy (NTP)

The Govt. of India has notified the National Tariff Policy in January, 2006. The Central electricity regulatory commissions was guided by the tariff policy. The objectives of the tariff policy are to confirm –

• availability of electricity at reasonable and competitive rates

• financial viability of the sector and attract investments The NTP aims to promote –

• transparency, consistency and predictability in regulatory approaches across jurisdictions

• minimize perceptions of regulatory risks

• promote competition

• efficiency in operations and improvement in quality of supply

UDAY (Ujwal DISCOM Assurance Yojana)

• Vision of UDAY Scheme to provide affordable and accessible power 24x7 for All

• UDAY assures the rise of vibrant and efficient DISCOMs through a permanent resolution of past as well as potential future issues of the sector.

• States shall take over 75% of DISCOM debt as on 30 September 2015 over two years - 50% of DISCOM debt shall be taken over in 2015-16 and 25% in 2016-17

Bidding guidelines for competitive procurement of power

The objectives of the recommendations notified on 19th January 2005 are –

• Provision for both long term procurement of electricity (7 years and above) and also for medium term procurement (1-7 years)

• The guidelines permit procurement which is location, technology or fuel neutral and also allows development of projects based on specific location or fuel tie-ups

Procurer mandated to make evaluation of bids public by indicating the terms of winning bid and anonymous comparison to all other bids.

Recommendations for Boosting Competition in Development of Transmission Schemes

The key objectives of the policy are to encourage private investment, facilitate transparency and fairness in bidding and procurement process. It aims to improve standardization in process and reduce ambiguity and henceforth time for materialization of schemes. The guidelines provide for payment security by way of letter of credit/ letter of credit backed by escrow mechanism and for Transmission Service Agreements to be entered between Transmission Service Provider and concerned utilities.

2.4 Indian Power Sector – Size & Statistics

Pattern of per capita consumption in India is observed that demand almost doubled every 10 years along with the Generation capacity added till nineties, the demand surged in late nineties & the Generation Capacity almost stagnated & grew very slowly defying the targets & requirement.

Transmission Capacity

The Central Electricity Authority (CEA) was made responsible for formulating Plans for development of Transmission System and coordinating the activities of various states. The Hydro resources are predominantly located in Himalayan foothills, in the North-Eastern Region and selected hills in some states like Karnataka, Andhra, Orissa ; coal reserves are concentrated in Bihar-Jharkhand-West Bengal area, parts of M.P., Maharashtra and A.P. whereas lignite is located in Gujarat and Tamil Nadu. To overcome this uneven distribution of generation/energy resources, the concept of Regional planning in Power Sector was introduced during the 3rd Five Year Plan (1961-1966). Accordingly, for the purposes of power planning, the country was demarcated into five power Regions viz. Northern (NR), Western (WR), Southern (SR), Eastern (ER) and North-Eastern (NER) (Figure – 1.4c).

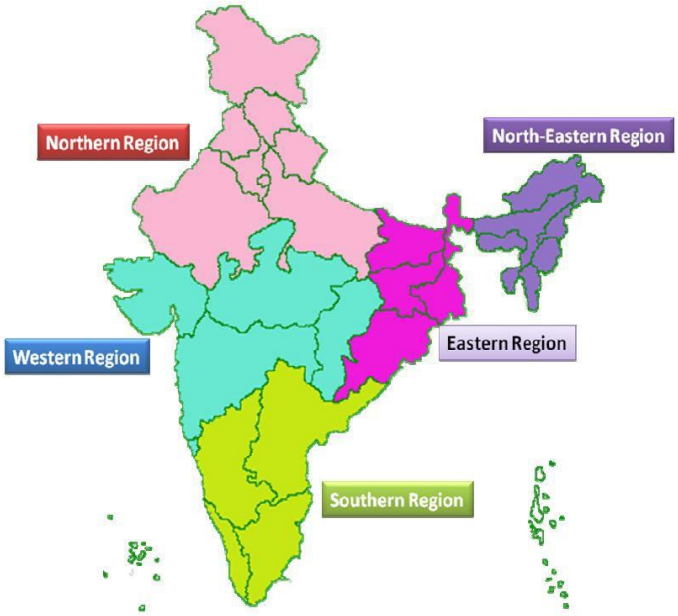

Figure 2 : Power Map of India in 5 Regions

Fig.2 shows the segregation of power section in 5 regions, in PGCIL website

Transmission system for evacuation of power from each generating station planned on the basis of integrated regional grid (with due consideration to the fact that as per the Kirchoff‟s Law, power flows by displacement/least resistance). Transmission network of each state as well as that of each generating company treated as commercially independent control area on Regional basis but operation in the integrated regional grid.

2.5 NEED OF PRESENT STUDY

Indian economy is growing at a rate of more than 8% per annum. In order to withstand this growth it is vital to have a strong power infrastructure to support it Lack of power will make high growth unsustainable. However, in India the demand and supply gap is widening; where demand is more than supply. The researcher intends to explore the reforms, and which reforms could be undertaken by the Indian government in future so that it overcomes demand supply gap and doing the same efficiently keeping in mind the limiting natural resources to achieve sustainable development. It is to make energy utilize smarter way so that we develop more out of prevailing potential supplies and while looking to improve new energy resources.

Many countries have undertaken reforms in this sector and have been quite successful in their implementation. Study of their experiences would prove very fruitful for Power sector.

Few of the causes for the shortage/lack of electricity supply are as follows: -

i. The growth in the installed capacity is not enough to meet the growing demand.
ii. Lack of optimum utilization of existing capacity
iii. Ineffective use of electricity by the end consumer.
iv. Insufficient inter-regional transmission results in huge T&D losses. Technical losses account for about 8 to 10% losses. Loss due to theft and technical metering is about 12to 14%.
v. Average cost of power is greater than ARR obtained. Skewed tariff system subsidizing agricultural and domestic consumers at expenses of industrial consumers.
vi. Political interference and no firm policy on disconnection to reduce this gap Indian government has already undertaken certain reforms. It was like setting your own house in order. The reforms include:-
vii. Establishment of independent Electricity Regulatory Commissions (CERC & SERC) to develop markets and fix tariffs.
viii. Freedom to set up captive generation capacity including group captive.
ix. Intent to unbundled SEB's
x. Private players encouraged in power generation.
xi. To overcome the problem of high tariffs, policy for selection of generators on competitive bidding.
xii. Mega projects policy
xiii. Setting up of power trading corporation
xiv. Effectively Compliance of Open access to consumers
xv. Settlement of outstanding PSU bills with states. These electricity reforms were just the beginning of improvement and are not enough. These reforms have not addressed many other problems like
xvi. Usage of information & Technology and many more. These reforms are just the beginning and are not enough to handle the power crisis. Power sector has many more challenges

to face. If India aspires the status of a developed country it will have to overcome the problem of power shortage.

2.6 Concluding Remarks

The brief history of Indian electricity Power Sector and their reforms across the spectrum of the Sector providing a snapshot of the turn of events in Generation, Transmission & Distribution of Power will be discussed. The analysis is figure out the recent reforms and anomaly in India power sector. The next chapter focus on reforms in power segments

CHAPTER – 3

Indian Power Sector Reforms

3.1 Need of Power Sector Reforms

Indian electricity sector is strained due high losses and nonexistence of favorable Regulations. The increasing vitality and reliability of the Indian economy system isn't matched by the electricity segment, which continues effected by governance and mismanagement. Government controls is that the furthermost vibrant infrastructure limitation on overall electricity economic system. The system is controlled and dominated by government infrastructure and machinery in the national levels; 90% electricity generate by Govt utility or institutes (state govt. contribute nearly 60% contribution), and transmission segment is sort of utterly in the general public sector. The high cash earning distribution company – wherever accountability for billing, collection and supply – sort of completely under the compass of corresponding regimes (through SEBs or Govt. DISCOMs). Private distribution model is implement to Delhi (our scope of study) and a few parts of Maharashtra, province, state (U.P.) and Gujarat. In the 12th era of the milln., surprisingly, few electricity electricity companies still have used old accounting practices for book-keeping. Each year, for occurrence, the Economic Survey keen quite 2/3rd of the sec. on electricity generation, transmission and “critical technologies”, while demoting the remaining 3rd portion to distribution.

The central government’s policies in initial 2000 tried to stimulate state govt. to confrontation escalating AT &C loss within the segment. The OTS schemes of SEBs dues to central govt utilities, as suggested by the Proficient board on Reimbursement of SEBs dues of GoI in 2001, related the “capital restructuring of SEBs” to a group enticements and punishments. In repercussion of the reform measures instituted after 2000-01, every states have trajectories in terms of the “operational steps” to cut back losses and rise revenue and income.

3.2 Reforms – Status

Initiatives

The notorious hay heap was unsettled charges *– Rs. 415 billion –state-owned electricity discoms to central owned "PSUs such* as NTPC, NHPC, Coal India Ltd., Indian Railways and PGCIL". Given the in-built restrictions on division of accountabilities b/t the states and center, and that sector is almost government owned . The mechanisms to impact the distribution segments performance and reliability in the distribution segments, which is underneath the control of states Govt.

Representing of said objectives to the precise initiative are as follows –

• **The OTS scheme** – the reorganize responsibilities and accountabilities that had been accrued on description of SEBs‟ persistent disappointment to make steady expenses, and settled their additions gaps and levied as price.

• **The Electricity Act 2007 (EA) –** facilitated and arranging a legal framework for jurisdictive changes. Though all features as – regulation reforms, tariff determination, and market structure, and competition scenario– of the difficulty completion of the power electricity corporate is control of state govt, EA (approved with broad) however was significant for introducing governmental suasion at central "state forums, Planning Commission" discussion with board in the framework of planning and distributions.

APDRP

APDRP, measures to speed up the state reforms by quickly supporting and then reestablishing the monetary viability of electricity power segment. Against this experience, the MoP established an professional level committee to scrutinize (and suggest the deviations) in the manner by which central govt. support for the electricity segment.

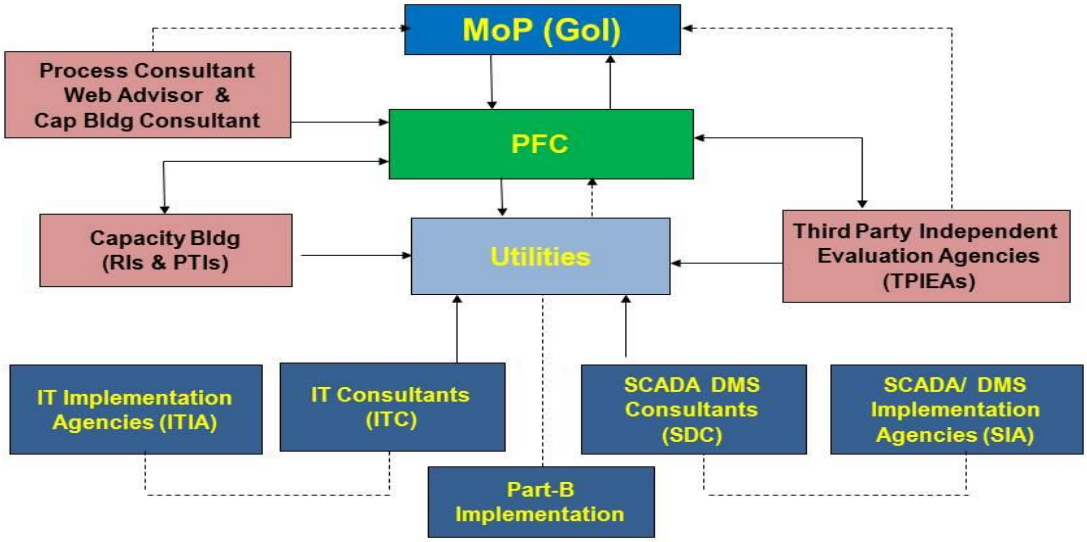

Figure 3 : R-APDRP features

Figure 3 R-APDRP structure define by the power ministry in union budget 2002-03, is shows the segregation of process in structured way and boost the sector and allowed the grant.

There were twofold parts of funding the APDRP Scheme – one for incentive and the second is investment sustained reducing operating losses and increase cash flows of the distribution sector. In Budget, 2002-03 officially change the features of scheme as APDP as APDRP, and boost up the distribution to Rs. 35 billion from Rs. 15 billion with the prerequisite that "access of the States govt to the fund are on the premise of agreed reform, the middle aim would be the narrowing and elimination of the gap between cost of supply and revenue realization within a specified time period".

It is problematic condition to found the enhancement in the currency flow of power segment has been allocated to central govt. or GOI initiative, and how ample had been on accounted of State Govt. want to reinstate the electricity segment health. The expenditures prepared on version of APDRP scheme had been diffident. Several advance states had been engrossed on higher-level (returns augmenting scheme) implements which had considered the form of –

- reducing Aggregate Technical and commercial loss
- rationalization concept
- load alignment, in specific treatment agricultural supply scenario and superior highlighting on supply to Non Domestic consumers and LIP consumers

The EA 2003

The EA defined a “process mapping” for a segment based apparent legal regime which introduce effective competition strategy and selection by integrating inspiring display of structures embracing liberalization of captive power, starter of open access act in “transmission sector and subsequently in distribution sector”, and therefore the providing for issuing multiple distribution licenses or retail wireless competition during a given area. A critically competitive model introduce within the EA wanted to boost and was exchange the model Single to a Multi-parties and take away monopoly of single distribution organization.

Towards harmonization of said guideline, the Act specified that the moralities laid out by the Central bodies in “generation and transmission” system should monitor SERCs. The EA transcribed the code for the facility sector from a national standpoint with reference to manage grid discipline and rationalized report of electricity sector.

Operational effectiveness

If there's progress in key indicators like revenue growth, reliability, sustainability, commercial feasibility, financial viability and profits, will or not it's justifiable? A vital feature in evaluation of effectiveness of business perfections is corresponding development within the operative efficacy of the structure. Ability to resist rivalry, decreases in supply disruptions, improve metering , maintain grid discipline and improve power quality of electricity parameters (as voltage fluctuations, sag, swell) are “well-being” pointers of a electricity power grid, and enhancements are a crucial measure for sector health.

Market Structure

The contestability is additionally measured to be a main feature for creating efficacies in energy segment operational feasibility. Notwithstanding the progression of the numerous variations within the marketplace configurations of the previous immobile State Boards, there had been fundamentally no alteration within the quantity and type of struggle for patrons. Though most progressive marketplaces, and plenty of developing ones, had developed quite speedily from race within the indiscriminately sections to wholesale struggle, in power segment virtually no development in most discoms in India notwithstanding an permitting atmosphere within EA 2003. The substantial of electricity dealt is just about 3% of the entire power wholesaled. Unfortunately, the strategy seem like to absence a roadmap and initiative near expansion of a competitive wholesale market, which should contain implementation of a path thoughtful and effectual transmission pricing legal platform.

3.3 OA market

Unique key reforms in EA, 2003, intended to make was competition within the power distribution sector through private power player main participation. OA i.e. non-utility consumption was geared toward this. It allows consumers to settle on the foremost economical seller of power, thereby introducing competition and fostering efficiency within the power system. The OA market allows huge customers of power (with demand of equal to 1MW or above) to purchase for cheaper and reliable power from the open marketplace or exchange. The key idea behind Open Access being that customers can make a choice from an oversized total of opposite companies quite than being enforced to shop for from prevailing Discoms, thus enabling them to acquire power at competitive prices.

3.4 Concluding Remarks

In this chapter provides the detailed information on the Power Sector Reforms from the Financial Perspective & the corresponding actions taken by Government & Policy makers. The India power is controlled by Govt. Bodies this is the main limitation of Power Industry. The next chapter focus on Delhi Power Sector model

CHAPTER – 4

Delhi Power Sector Model

4.1 Power Sector Reforms - Delhi

The Delhi Vidyut Board (DVB) was set up as a legislative u/s 5 of the EA, 1948 on February 24, 1997 and took over the business of generating, transmission and distributing of electricity in Delhi from the Delhi Electricity Supply Undertaking (DESU), a division of the MCD. The power situation in the National Capital started deteriorating from 1998 onwards which the GoNCTD introduced power segment reforms in Delhi with an opinion to develop the quality of service to the customers, make power accessible at viable prices, and improve operational efficiencies through reduction in losses as also the need for reduction of Government funding in the power sector. The origination of the reforms was found essential in the backdrop of the subsequent factors – Demand for power grew manifold in Delhi. As a measure of the reform process Govt. of NCT of Delhi took the following --

- **An independent regulatory commission, DERC was created on March 3, 1999, under the Regulatory Commissions Act, 1998.**
- **In 1999, SBI Capital Markets was selected as financial advisor to contribution in unbundling of DVB in privatization of distribution functions.**
- **For unbundling of DVB and privatization of its distribution functions, the necessary enabling legislation i.e. the Delhi Reform Act, was passed by Delhi legislature on Nov 23, 2000 and assented to by the President of India on March 6, 2001**

Based on the Inception Report submitted by SBI Capital Markets Ltd, the Govt took a decision in Jan 2001 to go ahead with the restructuring of DVB and privatization of its distribution functions. It was proposed that the generation company (the GENCO), would take over the existing three generation stations of DVB the transmission company (the TRANSCO) would take over the transmission network and the distribution companies (Central East, South West, North-North West) shall take up over the distribution activities

of DVB. **The Govt had qualified six bidders based on the bid submitted against the RFQ.** The RFP was issued for the bids to acquire 51% equity stake in the distribution companies with the following methodologies. **The bidders would bid on AT&C loss reductions in 5 years**. The bidder who proposes maximum reduction in losses as measured by the net present values of the revenues from loss reductions. The bidders can bid for all the three distribution companies but one bidder can be selected maximum for two companies. Based on the RFP, Tata Power & BSES bid for the three distribution companies and Tata Power was given 51% stake in North-North West and BSES was given 51% stake in South West & Central East distribution Companies.

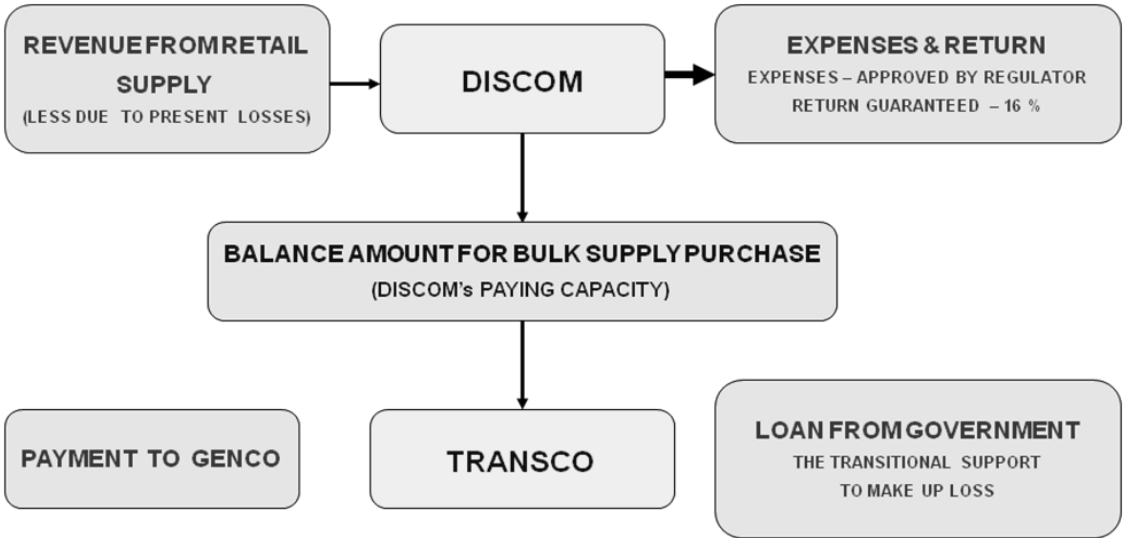

Figure – 4 : Delhi Power Sector Reform Model

Figure 4 It shows the Delhi power sector reforms model and define the unbundling structure as recommends by central govt. The source of said fig. DVB unbundling reforms act

Self-sustained Power Sector Reform Model was implemented in which financial support during transition period was assured by Delhi Government as shown in Fig. 4

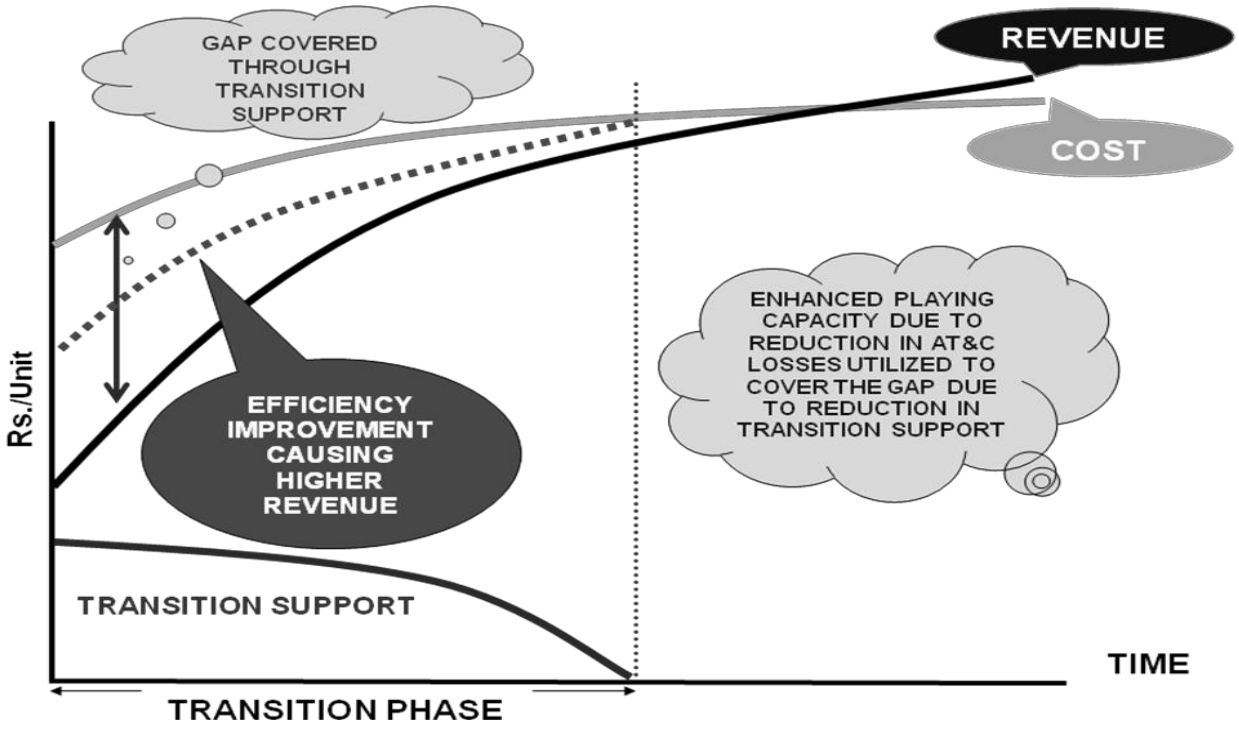

Figure – 5 : Need for Govt Support During Transition Phase

Figure 5 source: of said fig. DVB unbundling reforms act

During transition period it was support of Government was extremely important because of very high AT&C losses resulting in large gap between revenue & operating cost as depicted in Fig. 5

4.2 Power Distribution Privatization Framework

The only stream of revenue for the entire power chain viz. generation, transmission and distribution is the revenues from sale to retail consumers. Thus the power chain is only viable if and only if the distribution business is viable. It is also imperative that the business turns around within a short time frame as possible. Thus privatization of distribution is key aspect for achieving this objective.

The **key principles** of the framework are as follows –

1. Past Accountabilities and Past Loss of DVB are not to be distributed on to the descendant bodies.
2. There are tariff hike is no surprises to the customers.

3. The Government to provide funding for losses in the primary phase i.e. till the time the power business become self-sustainable.
4. Customers to get the max. benefit from the privatization implementation.

4.3 Asset Valuation

The Business Assessment approach is approved for assessment of assets of a working concern and involves identification of the actual asset value based on the revenue potential of the business. This methodology is also necessitated by the legal framework governing the power distribution business. In India, licenses have been primarily regulated by the application of the cost plus (also known as RoR) regulation recommended by the 6th Schedule of the EA. The Sixth Schedule stipulates that the consumer tariffs charged by the licensee should be adjusted in a manner such that after meeting all expenses (which include the interest on debt incurred for funding asset acquisition), the licensee earns the 'Required Rate of Return' (RROR) on 'Capital Base' which may be broadly be defined as the amount of equity invested into fixed assets.

The advantage of using business valuation is that it clearly identifies and factors in, the link between asset value and consumer tariffs and thus protects the interest of consumers. Business valuation also protects the interest of the utility since assets are valued at a level at which it earns a reasonable rate of return after considering future load increases, T&D loss reductions, capital expenditure for system up-gradation and tariff increases etc. This valuation method is consistent with the manner in which assets are valued by companies around the world that assets normally command a value, which is based on the profits that can be generated from the use of such assets.

Business Valuation Methodology

The estimation of the earning potential broadly involves projection of the revenues and expenses of the generation, transmission and distribution entities. Briefly, Business valuation involves the following steps –

- Step 1: Determination of Revenues based on estimate of:
  - Tariffs which can be reasonably charged from consumers

- Projected demand and available supply
- Existing AT&C Losses and loss reductions

- Step 2: Determination of Expenses based on estimation of:
  - Cost of power purchase from outside sources and own generation
  - Estimation of all expenses (including reasonable return) other than cost of power
- Step 3: Computation of Earnings of all three entities (generation, transmission and distribution)
- Step 4: Assumption of a debt equity ratio
- Step 5: Derivation of the asset value, such that the power sector becomes viable (i.e. starts generating a surplus) in a reasonable period of time, say in the fourth year of operations

Business valuation is not based on the details of individual assets deployed in the area of supply of a utility and hence any such comparison needs to be avoided. The value of assets as determined by this method and notified in the Transfer Scheme for the Generation, Transmission and the three Distribution Companies in Delhi are as follows –

Rs Crores)

Table– 4.1 : Asset Valuation

	GENCO	TRANSO	Central East	South West	North - North West	Total
Gross Block	510	650	360	1,533	1,210	**4,263**
Accumulated Depreciation	160	200	70	383	290	**1,103**
Net Block	**350**	**450**	**290**	**1,150**	**920**	**3,160**

4.4 CHALLENGES IN POWER SECTOR

In State Electricity Boards/Utilities or SEBs are in presence for last 5 spans. Over the time, they have develop unviable and loss-making due to heavy accumulated losses and obligations. Key challenge for State DISCOMS are as mentioned below.

- AT&C Losses

- Revenue Gap
- Non Cost Reflective Tariff

4.4.1 AT & C LOSS

The Modification b/w input elements recorded into the Distribution segments (Grid Substation) and also the components that the amount is received. Loss covered all Technical and Commercial losses. T&D Loss don't capture/recorded losses on account of non-realization of Bill payment. Accordingly the Transmission and Distribution loss wasn't able to record the particular losses within the distribution network, therefore, AT&C loss was presented.

Table – 4.2 : AT & C Loss comparison

FY	AT&C Loss (%)
2004	37.75
2005	34.33
2006	35.18
2007	30.59
2008	29.58
2009	27.74
2010	26.58
2011	26.04
2012	26.63
2013	25.45
2014	22.58
2015	25.72
2016	23.98
2017	20.26
2018	19.7
2019	19.2

Table – 4.3 : Delhi AT & C Loss comparison

YEAR	BRPL	BYPL	TPDDL
2003	47.5	61.9	47.8
2004	45.1	54.3	44.9
2005	40.6	50.1	33.8
2006	35.5	43.9	26.5
2007	29.9	39.0	23.7
2008	27.9	30.8	18.6
2009	20.6	24.0	16.7
2010	20.5	24.3	15.2
2011	18.8	22.0	13.8
2012	18.1	22.1	11.5
2013	17.7	21.1	10.8
2014	16.9	22.2	10.5
2015	13.7	18.9	10.2
2016	12.7	15.9	9.4
2017	10.7	12.7	8.6
2018	9.7	10.4	8.4
2019	8.93	9.7	8
2020	8.87	9.2	7.87

Calculation of AT & C loss is shown the real picture of any discom, accordingly we are calculate the actual gap 1 % of AT & C loss.

Assumption:

Technical Loss= 5%

Billing Efficiency =90%

Collection Efficiency =99.5%

Collection Amount: 7000 cr.

Prevailing Year AT & C = 8.5%

Target AT& C= 8%

So the (C.E* B.E) = 1-(new AT& C/100) = 1-(8/100) = 0.920

New Collection Efficiency= .92/.90= 102%

Desired eff. Collection required = 7000 cr. * 102%= 7155.556 Cr.

1 % AT & C Loss = 7155.56 – 70000 = 155.56 Cr.

8% AT & C Loss = 155.56 * 8 = 1244.444 Cr

So that TPDDL Loss amount is 1244.44 Cr in FY 19-20, this amount create a huge gap between the Required Tariff and actual. So that Tariff determination process may be considered such type of gap also. New infrastructure as pre-paid smart metering, effective TOD modeling and Reactive compensation techniques adoption required to overcome such huge revenue gap.

4.5 REVENUE GAP

Tariff is set sustained the principle that there should be 100% recovery of ARR for that particular year. If ARR goes to be increased or decreased, respectively tariff requirements to be improved for the financial viability of system. Thus, if there's no growth in tariff, there would be a situation of revenue deficit, which eventually needs to be recovered from customers in ensuing years collected with the carrying charge. The absenteeism of the value reflective tariff has caused in formation of the Revenue Gap and Delhi DISCOMs and SEBs have previously been facing such problem of insolvency of this accumulated Revenue Gap.

4.6 Concluding Remarks

This chapter provides the detailed information on the Delhi Power Sector Model along with the privatization process involving the financials etc. The Delhi Power Sector model is unique JV model b/w the Govt. of Delhi and Tata Power. As per my suggestion this model is beneficiary for all Indian Power Sector. The private partnership are introduce competition in retail and wireless industry. The next chapter focus on tariff policy and process.

CHAPTER – 5

Tariff Policy

Promotion of competitive scenario in electricity segment is the core aims as per EA, 2003 and reform act EA 2007. Purchase cost is the main cost component for distribution segment almost 90%. “Competitive power purchase” of electricity in distribution utility is predictable to decrease the total power purchase cost and simplify growth of electricity markets. Worldwide, rivalry in extensive electricity marketplaces has directed to decrease in charges of energy and in substantial paybacks for customers sections. EA’2003, Section 61 & 62, deliver for tariff directive and legitimate regime to determination of tariff.

EA’2003, Sec. 63 states that –

“Notwithstanding anything contained in section 62, the Appropriate Commission shall adopt the tariff if such tariff has been determined through transparent process of bidding in accordance with the guidelines issued by the Central Government.”

Recommendations had been outlined u/s 63 of the EA. The explicit points are as follows:

1. Endorsing inexpensive energy purchase by utilities;
2. Enabling clearness and impartiality in electricity purchase processes;
3. Facilitating diminution of irregularities for numerous buyers
4. Protecting customer interests;

5.1 Parameters of Tariff Policy:

Tariff Policy should imitate to the strictures laid down in Sec. 3(1) of the Act.

A. The Policy should goal at optimum utilization of other resources, and may be a documented that permits the nation to own a composed mixture of accessible resources

for such growth.

B. The Policy paper should be a short and concise. It should concentrate on creating a vivacious power sector for confirming trustworthy and quality power to the customers at reasonable rates.
C. It should support the individuality and authority of the State Regulators for requiring the determination of Terms and Conditions of Tariff, and for liquidating such other tasks as are commanded under the EA.

5.2 Concluding Remarks

This chapter explains in brief the tariff policy. In Indian Power Sector Tariff Policy are improved day by day. But still some anomaly are exist. The Govt. Monopoly in Indian Power are persist accordingly losses and revenue gap increased day by day. The next chapter discussion on tariff concept

CHAPTER -6

Tariff Concepts

6.1 Operating and fiscal Analysis

Every organization within the current scenario requires reliable and efficient supply, let alone implements of research which minimize hazards and simplify sound decisions. The main points of T&D losses highlight the obligation for emerging a system and improved operational management, which can simplify fixation of accountability at every stage. By developing such a system it should be conceivable to enumerate the corresponding operating disasters in monetarist terms and relation thereof with routine evaluation scheme is also enabled.

Electricity Tariff is fixed based on rational costs determined by the SEB after Prudence check as following:

Table – 6.1 : Tariff Component cost %

S.No.	Costs Components	Approx. % in the Tariff
1	PPC, Purchase Cost	80%
2	Operation Expenses - Employee - Administration - Repair & Maintenance	5%-7%
3	Depreciation	3%-4%
4	RoCE	5%-6%
5	Tariff = Amount Billed/Billed (in KWH)	

The Regulator concludes the Tariff for various categories based upon its Tariff Regulations and recommendations contained in the EA 2003 and the NTP 2006. The Regulatory Commission undertakes extensive public conference with all stakeholders including consumers before deciding the Tariff.

6.2 Price Methodology

The pricing device in a regulatory structure has been conventionally based on the two techniques as below:

1. *RoR- Rate of Return*

Is a "cost plus pricing" approach, which originates its consultant from sec. 59 and the 6th Schd. of EA, 1948. The technique simplifies a utility to collect all its *prudentl*y sustained cost/expenses, in addition to a controlled reoccurrence on *prudent* investment .
The formula approved for calculation of yearly revenue requisite is as follows:

"RR = [RB X ROR] + ED + EO&M + T"

Where,

i. RR = the total annual revenue requirement of the utility
ii. RB = the rate base of the utility = Capital base
iii. RoR = the allowed rate of return on investment = Reasonable return in case of a licensee
iv. and not less 3% surplus for the Board
v. ED = depreciation expense
vi. E O&M = O & M expense

vii. T = taxes

The equation calculate the ARR of discom as shows the various obligation and gap in operation and economical terms. Each constituent of the revenue component has to be carefully calculate in mandate to confirm the validation for presence in the cost of supply to be delivered.

2. Performance Based Regulation (PBR)

This practice inclines to announce a component of inducements for rastically improvements in key function supported beyond the standard range. In this method, licensee can be penalized for bad performance. The structure leads a pushed governing lag, which decreases the need for rigid regulator directed in very recurrently. In this method contains of setting the lowermost tariffs for a stretched time duration, 6 to 8 years and adjusting of tariff preparation on the idea of enactment of utility as replicated in selected factors. The grants/punishments being providing in financial terms disturb the cost-effectiveness of the utility/organization.

In PBR structure of regulation has to be formulated in such mode that the penalties and rewards are controlled systematically and don't lead to gratuitous enhancement of the licensee/utility.

3. Price/Revenue Cap Regulation

This technique is a variation of PBR method. The formula to be adopted is

Pmax= "P-1(RPI – X) + Z"

Where,

1. Pmax = Control of price for base year
2. P-1 = price for the preceding year
3. X signifies the productivity of the licencee
4. Z apprehensions the exterior changes dissimilar to inflation

6.3 Determination of revenue requirement

Charges and returns are two judgment areas that guide organization for their improvement in great extent. The effectiveness of the organization depends on the extent costs with applicable revenue.

After selection of suitable costing method, the following phase in tariff identification process is identify the revenue requirement mapping on the extent of sensible monetary philosophies as clarified above. This said exercise is supplemented by the projections of passed revenue.

Consequently, the tariff at which the licensee could also be allowable to recuperate all the cost prices from the beneficiary customers is to be decided.

1. *Historical accounting cost and sales volume method*

In the past sales and cost the particulars of expenditures required for successively the licensee and revenue returns accumulating in progression of exoneration of this accountability are obtained for a trial year (a 12th months duration). The trial time could also be whichever the time instantly forgoing the existing year or alternative recognized year because of certain precise explanation for assortment on the idea . These projections are projected into the long run by taking into consideration the consequences of "**known and measurable events"** and aspects, which are absolute to stimulus the outcomes b/t the trial year and therefore the year that the tariff component is to be applied. This process providing a component of stability, does have the downside of being unpredictable by ERC Act, 1998 therein the predictable statistics specified by the icensee.

2. *Estimated marginal costs and forecast loads*

Projected minimal charges and projection demand is the 3rd technique**,** which is used in modest marketplaces. The minimal charge model has devised from traditional economic models of the preceding era. *As resulted, the consumers are keen to recompense for a*

facility equivalents the worth of the capitals essential to generate it, and customer achieves the optimal level of o/p for several specific product or service.

(Source: “Electric Utility Cost Apportionment Handbook issued by NARUC California, USA”)

6.4 Basis for valuation of assets

Assessment of properties of licensee is the subsequent phase for tariff identification by the Regulatory Commission. Regulatory Board, u/s 59 of the EA, 1948, the valuation of fixed properties of the boarding in life of asset at commencement of the financial year means the actual cost can be reduce of fixed component with the help of timely prudence check and properly implementation of orders.

Strategies for Valuation of assets

1. *Original cost minus depreciation*

In this approach the “calculations are rather simplistic”, consideration the value of properties of the licensee and removing the “depreciated value on basis” of prevailing standards within the electricity segments at the pertinent point of your time. This process continues to be broadly used because it affords itself to suitability of estimation supported documented records and also because it leaves some incentives for the licensee to earn revenues on the initial investment. However, the results of assessments could also be different thanks to the change within the monetary and also the devalued assets.

2. *“Reproduction or replacement cost of assets less depreciation”*

In this strategy, the PV of assets as reproduced in imitation costs (i.e. the value of manufacturing the products within the specified time frame) and auxiliary costs i.e. the value of manufacturing a brand new asset (based on existing innovative technology), needed for execution the identical function, is considered and devaluation at suitable charges or process is withheld therefrom. During this method the complications likely to be faced are

3. *Business Valuation*

Another existing process which is trusted upon for such exercise is understood as Business Assessment Methodology. During this strategy, the tariffs, which might rationally be charged from the all customers, are determined.

The revenue accumulating to the licensee concluded the tariff is formerly evaluated after taking into attention the decrease in technical losses and load growing scenario.

4. *Valuation of assets by independent assessor*

In this strategy, the licensee has a choice to retain third party evaluator for assessment of "assets on basis" of existing value or historic costs plus appropriate modifications in version for consequent devaluation /obligation. This approach also has the some disadvantages as previous one

i.e. lack of normal factors for valuation of worth for plants, equipment, apparatus and structures which were bought 20 to 30 years back. The evaluation within the nowadays doesn't have the choice of bidding method. The licensee should continue with a annotation of maximum provision or any uncertainty about under evaluation of assets or over valuing is absolute to invite contrary public response and forming difficulties in finalization of electricity tariff.

6.5 "Assignment of Revenue Requirement in Tariff Design":

The succeeding phase is obligation of income. During this activity the commission has to make appropriate distribution of revenue prerequisite to varied segments of services, which move to eventually constitute the complete output of the licensee. The comparative weight of fundamental essentials is evaluated and on beginning of cost levied on the structure, it's selected what quantity share is due within the full tariff to which component. There are three significant methods for this application.

1. *Embedded Cost Based tariff*

In this technique focused on past costing methods is employed for assigning the income prerequisite to phases of service. The allocator allocates system burden to the constitute classes or high end customers irrespective of low end customers. The apportionment relies on the collection of power allocation factors on the results of a “trial year”. Variety of hypothesis depends hit and trial method of such factors will be conceived. This panorama also leaves much possibility for difference b/t dissimilar allocators who measure materials on basis of separate insights. The valuation practice depends on the past data presented with the licensee.

2. *Marginal Cost Based Tariff*

The cost based tariff method makes valuations of the revenue necessities for various category of consumers distinctly on basis of “marginal costs” relevant for “separate group of customers”. The full revenue realization thus considered is equaled to the mixture revenue necessity of the licensee. The regulator identify the gaps and resolve the gap as per the tariff scenario or carry the in-house modifications and instantaneously confirming that the monetary viability of the facilities isn't negotiated. The method is to be consistent with the purposes of preferment of efficacy in order that the licensee is assured of suitable cost of supply salvage while maximizing the amount of customer gratification and supply quality services. The intellectual submission of this method ends up in enhancement of operational principles and fix reasonable price strategy to the customers. The foremost disadvantage of this method is that it mustn't safeguard suitable cost retrieval for the licensee. The revenue gap inclines to be negative in an underutilized structure and constructive within the capacity controlled system.

3. *Social Tariff Making*

Political awareness to the problems of societal justice of licensee, customer pressure,

environmental and other economic and non-economic factors occasionally demands on a licensee, undesirably distressing its viable operation. The Collective Tariff determination procedure relies on in-house changes of revenue b/w diverse customer groups without much technical and practical basis. During this strategy, the distribution arrangement of revenue for various groups or customers is created on account of primacy allocated as policy defined without much contemplation to economic provision. This system isn't an efficient, reliable and methodical concept and usually results in generation of subsidies and grants. The reformist economic models have recognized that aids or grants of such environment fail to attain the vital objectives which influence the ”political” higher cognitive process, since, an awfully slight fraction of the input explorations up to the objective groups. The grant on puts stress on the structure and contains a negative influence on the effectiveness enhancement procedures. The method doesn't map the actual requirement of tariff.

6.6 Concluding Remarks

This chapter explains important concepts in finalizing ARR and hence the tariff. The tariff main part is valuation and prudence check of discom asset and monetary requirements. The ARR finalization is typical concept, the determination of ARR and finalization of Tariff on annually basis but due to anomaly in power sector, Tariff finalize in a 2 or 3 year gap. The next chapter focus on tariff determination process.

CHAPTER -7

Tariff Setting Process

The EA, 2003 commands the SERCs, including the DERC, to require processes contributing to expansion the eaders in the electricity sector in an economic, effective, reliable and competitive mode.

The NPT and also the Delhi Act, 2000 also directed the Regulator within the tariff identification process and direction and publication of tariff guidelines.

DERC has follow a guidelines for Tariff identification u/s 29(2) of the ERC, u/s 57, 57A and 59 of the EA, 1948 and also the 6th Schedule affixed thereto deliver the knowledge and direction of tariff determination process. The Regulatory has the freedom to proceed perpetually and adequate explanations from the formerly standard tendencies of price valuation, by stand-in in its own understanding, reinforced its evaluation of the existing situation in energy segments within the country. The regulator agenda has got to cater to a condition where the capability segment have been considered as a nationwide control is moreover obligatory to explanation for operation of the economic procedure in valuation of energy. The accomplishment of ordinary efficiency through whichever the economic process or decision-making up gradation is that the target aim of the Regulator.

The process for publicizing a tariff is contain single with quite a lot of stages. It is started once a utility file in tariff petitions with the Commission along with financial particulars like expenditure, the books, losses and interests, ROE, ROI, Opex, Capex Other Business cost. The appeal also consist of the discoms' proposals and demands for the ARR. This is an yearly process as per MYT. The subsequent step includes placing the appeals on public domain for stakeholder’s comments and suggestion. In adding to that, a community meeting is also conducted to pursue observations from the public and other stakeholders.

Afterward taking all this consideration, DERC concludes on what the new tariff should be. In b/w, there are certain things, which don't fall into the DERC's control just like the power purchased cost by the discom is uncontrolled parameter. These steps are considered

before the finalization of electricity tariff order. DERC has its own specialists to require care of the inspecting and prudence check as and when required, the regulator also take facilities of third party or outsource these activity. Revenue gap is calculated and tariff is approved to hide the revenue gap from consumers.

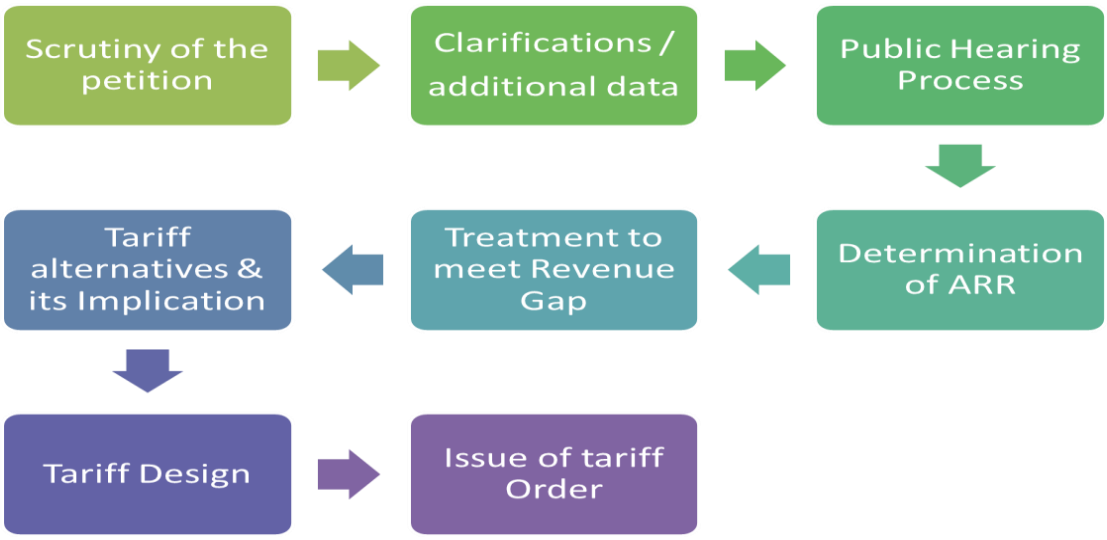

Figure — 6 : ARR Approval and determination process

Fig. 6 shows the steps wise process of tariff determination process.

7.1 Tariff Filing:

The observations of the participants usually place due highlighting on customer complaints, supply quality, Tariff hike, Cross subsidy surcharges, AT&C loses, Fixed Cost, and transparency in interpretations of Discoms, fuel expenditures, investment etc.

Afterward, public meeting are conducted on the Tariff appeals where stakeholders acted and discussed their suggestion and issues and submitted their views also. The stages taken by the Regulator for handling the tariff appeals are summarized as below:

I. Examination of Discoms petitions for data, research of deficit documents thereon for the requesters to take reminder and eliminate the anomaly;

II. Practical meetings conducted with the requesters for pursuing superfluous material or

explanations;

III. Favorable the newspaper announcements of the utility philanthropic relevant structures of the discoms tariff appeals and calling for community or stakeholders observations;

IV. Nomination of employee of the Regulator for serving the public understand the MYT Appeals of the utility and their component;

V. Investigative the public comments and replies of the utility.

VI. Responses are filled by the utility to all individual stakeholders;

7.2 Tariff Design

DERC observes whether the discom is deficit or Revenue Surplus. The former case, there would be certainly not necessity for upsurge in present tariff. In latter case, DERC observes discoms‟ disputes to extend the tariff and approves after scrutiny.

7.2.1 Scrutiny of the petition

- A initial scrutiny of the appeal is completed by the Regulator and just in case of deficiencies, a deficiency note is issued to the licensees.
- Licensee replies to the note within stipulated period of time.

7.2.2 Clarifications / Additional data

- SERCs may also demand for additional data and clarifications, if any required from the distribution licensee/utilities.

- The Regulatory Commission, having had all the proposals prepared by the Petitioners and afterwards ensuring and prudence check that the info / evidence submitted by the Requester is correct as, accordingly admits the appeal for further processing.

7.2.3 Public Hearing Process

- The Commission conducts public hearings on the tariff filing made by the licensees after receiving the responses from the general public and subsequent replies from the concerned entity.
- The hearings conducted or held different section of consumers, an opportunity and a forum to express their views, suggestion and concerns on the said subject.
- The Regulatory Commission has the authority to define the stages, the place, the manner, the date and also the time of the hearing, because it may consider appropriate.

• **The public hearings held last for 3 to 8 days depending on the number of respondents and the process approved by the Commission.**

7.2.4 Revenue determination

- Revenue from sale of electricity at prevailing tariff for various category of consumers is calculated together with revenue from other businesses.

- Revenue also adds subsidy provided to the licensees/utility from the Central and State Government.

- **Revenue Deficit/ Surplus** is calculated by deducting Total revenue computed from Net Revenue Requirement (i.e. ARR) .

7.2.5 Treatment to meet Revenue Gap

- Tariff increase/decrese

- Subsidy from state government/ Central Govt

- Increasing the efficiency of the utility/licensee – by reduction of AT&C loss, targets based on utility plans including CAPEX and OPEX

- Efficiency norms

  - Billing & collection efficiency
  - Level of arrears and type
  - Quality of service
  - Enhancement in operational efficiencies
  - Effective demand supply management (DSM)
  - Savings in power procurement

- Regulatory asset

- Revolving bank guarantee from financial institutions

7.3 Concluding Remarks

This chapter explains How DERC and the utilities together interact to finalize the tariff. Tariff process is cumbersome and complicated. They are contains different steps as per EA 2003 and MYT. Each step in determination of Tariff finalization is follow as per legal regime and noncompliance create a problem for Regulator as well Discom. So that compliance is

compulsory and not favorable for Customer perspective due to follow the lengthy process and time consuming activity. The next chapter focus on TPDDL profile and their achievement in distribution sector.

CHAPTER -8

TPDDL – Company Profile

8.1 Introduction

The TPDDL (earlier cited as „NDPL") was incorporated under the provisions of the businesses Act, 1956 with its corporate office at NDPL House, Kingsway Camp, Delhi 110009. The Tata Power got its name changed as "Tata Power Delhi Distribution Limited" (TPDDL) from "Registrar of Companies", "Ministry of Corporate affairs" on 29.11.2012.

TPDDL lawfully succeeded to the distribution assets of DVB w.e.f. July 1, 2002 and has since been ending electricity distribution and retail supply in its area of Supply as defined in schedule H, Part-III of the Electricity Reform (unbundling of Power sector, Transfer Scheme), 2001. TPDDL could be a JV b/w Tata electric company and also the GoNCTD of Delhi with the 51% stake being held by Tata Power.

TPDDL allocates electricity in North & N/W area of Delhi and serves a populace of 16 Lac. as on date. The Organization started operations on July 1, 2002 post the unbundling of erstwhile DVB.

TPDDL has been the front-runner in implementing power distribution reforms and technology within the capital city and is acknowledged for its consumer friendly approach and practices. Since privatization, the Aggregate Technical & Commercial (AT&C) losses in TPDDL areas have shown a record decline. Today they stand at 7.87% (As on March 31, 2020. On the ability supply front too,

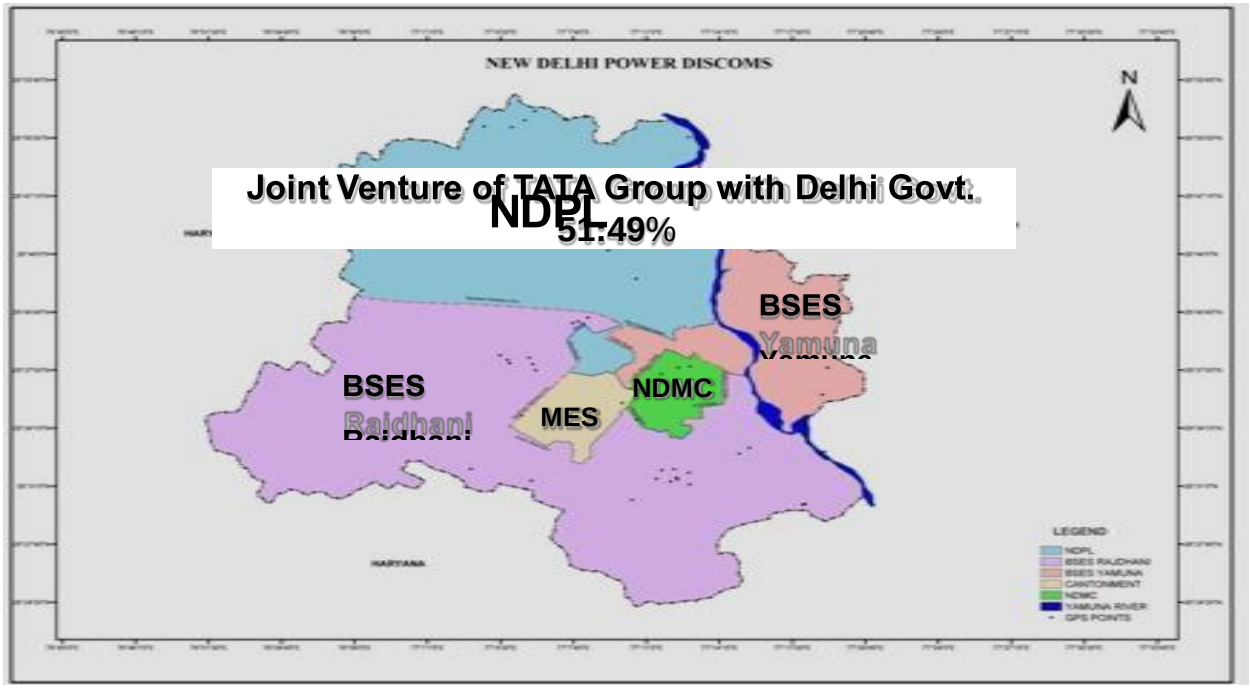

Figure –7 : Geographical Division for DISCOMS

Figure 7 It shows the geographical division for DISCOMS, available in TPDDL site

TPDDL has to its credit several firsts in Delhi: SCADA controlled Grid Stations, Automatic Meter Reading, GSM based Street Lighting system and SMS based Fault Management System. To ensure complete transparency, the company has provided online information on billing and payment to all its 1 million consumers. This happened in the first year of operations itself. TPDDL believes in providing more value than just electricity and is even rewarding its consumers for timely payment.

TPDDL must its credit several firsts in Delhi: SCADA controlled Grid Stations, Automatic Meter Reading (AMR), GSM based Street Lighting system and SMS based Fault Management System. To make sure complete transparency, the corporate has provided online information on billing and payment to any or all its 16 Lacs consumers. TPDDL believes in providing more value than simply electricity and is even rewarding its consumers for timely payment.

TPDDL has won several accolades for its pioneering efforts in electricity power distribution sector. It's the rare distinction of being the primary power distribution utility from India to own received the distinguished honour within the international category by winning the 2008 Edison Award and again in 2009 for Policy Advocacy. A number of the opposite key appreciations include international Palladium Balanced Scorecard Hall of Fame award- 2008, SAP Ace award 2008; UPN, USA metering award; Asian Power Award 2011 (5th consecutive year), Asia's Best Employer Brand Award 2011, Falcon Media Group- Best Performing Utility (Urban), India Power Award- Research & Technology and also the Asian Power Most Inspirational CEO of the Year 2008 award, Tata Power-DDL Bags 3 Awards at ICC Awards-2018, best performing power utility award at CBIP Awards,2018, TAAP Jury Award, 2017, Safety Innovation Award 2017, Saathi Campaign at CMO Asia Award 2017, Business World HR Excellence Award 2017Most innovative DISCOM at Indian Chamber of Commerce 2017, Solar Utility of Indian Award 2017, Best place to work 2019 .

It is also the sole distribution utility to receive the ISO 9001, ISO 14001 and OHSAS 18001certification.

8.2 Journey toward Excellence

TPDDL has consistently over-achieved its targets and improve their performance drastically over a short span of 16 years brought down the AT&C loss level from 53% to 8% along-with major improvements in quality of supply, reliability of network and consumer services.

TPDDL is a Utility which distribute electricity through its distribution network at structured tariffs to all consumers' categories in its licensed/demarcated area. TPDDL has been in the forefront in the adoption and innovation of latest technology in the distribution sector. Composed with its culture of Consumer Service Excellence, Performance Orientation, Continuous Learning, Innovation, Excellence and women empowerment, it has been able to set standards of faster reduction of

AT&C losses (~75%) and enhance consumer satisfaction index. Growth plans of TPDDL include increasing the activity base within licensed/utility area and praising Tata Power‟s growth plan into distribution business Internationally/Nationally.

In order to maximize its core competency, increase employee engagement, satisfaction & enrichment it's made invade IT& SCADA consultancy although it's low revenue potential compared to the distribution business/ segments. TPDDL has adopted climate change Policy in line with Tata Group‟s Policy.

8.3 Power Scenario in Delhi

The energy in Delhi during 2019-20 was supplied 1267.29 BUs against the demand of 1274.56 BUs during 2019-20, however the peak load in the said period has increased from 169.46 GW to 168.74 GW during the same period. In Delhi region, the load is rising at the next pace as comparision to allocated energy. Besides other reasons, this phenomenon could also be recognized to growing growth, deviations in life style and efficiency enhancement within the distribution system.

8.4 Power Scenario in TPDDL Area

Comparable development has been detected within the TPDDL area. The load in TPDDL constituting demarcation is rising steadily over the earlier years for example, load in TPDDL area has rising from 1286 MW to 1947 MW through the FY 10-11 to FY 19-20.

8.5 Challenges

TPDDL operates in a regulated setup and is the sole distribution service provider in its licensed.distributed area of supply. However, once the Open access regulations and the associated applicable charges get firmed up by the Regulator,

the possibility of power distribution through other utility/licensee might become a reality. It is worthwhile to mention here that though the said Regulations have been formalized by DERC almost two years back, open access has not seen the light of the day owing to issues related with intra and interstate network infrastructure and the costs related with its use. TPDDL‟s corporate scenario has undergone a change owing to the change in the Regulatory framework with particular reference to Power Sourcing and the Supply Code & Performance Standards Regulations 2017, instituted by DERC. The MYT regime specifies that TPDDL has to reduce the AT&C loss levels to 7.87% by 2020.

Significant Challenges before NDPL/TPDDL and proposed strategies for addressing them are computed below –

AT&C Loss Reduction Targets – AT&C Loss Reduction Targets/trajectory are becoming stringent and a challenge to achieve and surpass due to fading marginal returns together with the GoNCTD

Open Access –Open Access (OA) in Distribution was introduced in Delhi from July 2007 for consumers with a load of 5 MW and above. The sanctioned load limit for Open Access has been gradually reduced over the years with consumers having a load of 1 MW and above becoming eligible to choose Open Access regime w.e.f. July 1, 2008. While the company doesn't foresee any major threat in retaining its existing consumer base, the avenue of providing supply to consumers in other areas of supply is a chance which it's examining.

Power Availability at Competitive Cost- Power Purchase Costs represent above 80% of the total expenses of any distribution utility/licenses; arranging adequate amount of power at reasonable tariffs rates and provide reliable power supply, represents a significant challenge. In-order to satisfy its peak load demand, the corporate is forced to obtain power through expensive bilateral purchases. This affects the common power procurement cost of the organization

Human Resource Challenge – Limited individual growth opportunities within NDPL/TPDDL Licensed area, coupled with opening up of the Sector is resulting in

the Company facing attrition and the risk of losing its trained and experienced manpower.

8.6 Concluding Remarks

In this chapter we discussed about brief introduction of Power DISCOM under study i.e. TATA Power Delhi Distribution Limited. The next chapter focus on sales growth forecasting and tariff requirement and their gaps.

CHAPTER -9

ARR Components-An Explanation and Analysis

(Primary Data Source: Tata Power Delhi Distribution Limited)

9.1 Controllable / Uncontrollable Parameters

All Parameters, as O & M cost, Administration cost i.e. are considered as controllable and power purchase cost considered as uncontrollable parameters. Revenues/ Expenses have been segregated as Controllable or Uncontrollable based on the Discoms‟ capability of controlling or influencing such parameters. While the variance between actual and approved budgeted expenses and revenues on account of “Uncontrollable Parameters”

Controllable Parameters

O&M Expenses, comprising of Establishment Costs, Managerial and “General A&G Expenses and R&M Expenses” have been designated as Controllable Costs. Discoms have been allowed the flexibility of inter-se adjustment of expenses within the overall approved O&M Expenses. This is an important deviation from the earlier ARR and tariff setting regime where no offsetting was permitted and any saving under any expense head was trued-up without first adjusting the savings against any excess expenditure under another expense head.

AT&C Loss Reduction Targets are also considered as a Controllable Parameter and any under- attainment of the shall be account of the Discoms.

9.1.1Uncontrollable Parameters

Power Purchase Costs (Quantity and Rate), Sales (Quantity and Rate) and Capital Investment and consequently financing thereof have been classified as Non-Controllable Parameters and the same shall be trued up in succeeding tariff settings. While power purchase and sales shall be trued up yearly subject to attainment of “AT&C Loss Reduction” Objectives, variation in principal investment

and consequential impact on RoCE & Devaluation and prudence check at the completion of the monetary year.

TPDDL case has been taken as an example to understand how annual revenue requirement is estimated.

9.2 ARR for FY 19-20 for TPDDL

Sales Forecasting bases of past data trend are projected:

Sales forecast of FY 2020-21 is based on following methodology:

The sales projection activity are prepared bases of past data. The past data or Raw data was arranged on TPDDL site. Based on Past data we are analyze the sales forecasting.

A sales forecast is the volume of returns a utility supposes to produce at certain span and predict the future growth and liabilities. It's a prediction that of future revenue. Similarly the forecast help determine the future growth and financial health of the discoms where load and consumer tread may be vary depends on customer growth.

There are a several of advantages for projections to projections help the organizations to improve their capacity to provide the reliable services to customers. “Banks often base their loan decisions on the time frame in which a business turns a profit”. The sales projection help the power utility to identify the power purchase requirement in future. Based on power purchase requirement, utility arrange the low cost power as per the requirement.

Table – 9.1 : Forecast of sales

Sl.No.	Categories	FY 10-11	FY 11-10	FY 12-13	FY 13-12	FY 14-15	FY 15-16	FY 16-17	FY 17-18	FY 18-19	18-19								CAGR- based on FY 18-19 sales							
		MU's	MU's	MU's	MU's	MU's	MU's	MU's	MU's	MU's	5 months 18-19	7 month 18-19	5 months 19-20	Growth	7 months 19-20	Projected FY 19-20	FY 19-20 (Based on 3 months simple)	FY 20-21	8	7	6	5	4	3	2	1
A	Domestic	2,433.00	2,718.34	2,844.98	2,948.78	3,074.90	3,313.25	3,404.47	3,770.50	3,946.72	2,072.29	1,874.42	2,212.70	6.78%	2,001.42	6276.76	4,214.12	4077.87	6.23%	5.47%	5.61%	6.00%	6.44%	6.01%	7.67%	4.67%
B	Non domestic	1,002.00	1,096.62	1,184.34	1,240.21	1,278.25	1,343.24	1,403.58	1,463.16	1,527.96	699.33	828.63	742.17	6.13%	879.38	1622.60	1,621.55	1692.75	5.42%	4.85%	4.34%	4.26%	4.56%	4.39%	4.34%	4.43%
C	LIP	1,883.00	1,961.95	2,012.00	2,105.08	2,192.14	2,278.71	2,349.25	2,312.81	2,432.50	978.87	1,453.62	1,059.42	8.23%	1,573.23	2635.06	2,632.64	2713.37	3.25%	3.12%	3.21%	2.93%	2.64%	2.20%	1.76%	5.18%
D	Agriculture	19.00	16.31	14.16	11.68	11.86	12.82	13.32	12.64	13.04	5.00	8.04	6.95	39.17%	11.19	18.37	18.14	18.86	-4.60%	-3.15%	-1.37%	2.22%	2.39%	0.55%	-1.08%	3.14%
E	Public lighting	55.00	80.17	97.31	108.95	124.07	143.78	148.28	148.00	153.99	57.82	96.16	43.91	-24.06%	73.03	120.93	116.94	120.93	13.73%	9.77%	7.95%	7.16%	5.55%	2.31%	1.91%	4.04%
F	Delhi Jal Board	153.00	182.02	172.12	203.48	204.15	218.82	228.83	238.74	242.83	95.43	147.40	95.16	-0.29%	146.98	242.55	242.14	247.79	5.94%	4.20%	5.90%	3.60%	4.43%	3.53%	3.01%	1.71%
G	Railway Traction	54.00	52.25	56.92	49.58	45.51	46.21	46.16	48.06	51.44	21.41	30.03	4.09	-80.92%	5.73	4.09	9.82	0.00	-0.61%	-0.22%	-1.67%	0.74%	3.11%	3.64%	5.56%	7.03%
H	DMRC	99.00	156.55	162.93	159.76	133.71	140.07	149.45	149.50	155.19	63.71	91.49	120.52	89.18%	173.07	210.59	293.59	82.00	5.78%	-0.12%	-0.81%	-0.58%	3.79%	3.48%	1.90%	3.81%
J	Advertisement & Hoarding	-	-	-	0.60	0.62	1.54	0.97	1.18	0.91	0.16	0.75	0.15	-1.79%	0.74	0.89	0.89	0.94				8.62%	9.82%	-16.12%	-3.41%	-23.33%
K	Others*	77.31	108.07	138.26	123.10	105.17	100.22	92.38	97.98	94.45	43.31	51.14	26.76	-38.21%	51.14	72.71	77.91	84.48	2.54%	-1.91%	-6.15%	-5.16%	-2.65%	-1.96%	1.12%	-3.60%
L	Open Access charges offered as Non-Tariff Income	-	-	-	-	-	-	-	-	-		-														
	Total	5,775.31	6,372.28	6,683.02	6,951.22	7,170.39	7,598.66	7,836.70	8,242.57	8,619.02	4,037.33	4,581.69	4,311.83	6.80%	4,915.92	11,204.57	9,227.75	9,039.00	5.13%	4.41%	4.33%	4.39%	4.71%	4.29%	4.87%	4.57%

Table – 9.2: Average CAGR

Sl.No.	Categories	Y-O-Y Growth					Average Growth since last 5 year	CAGR for FY 20-21	Remark	
		FY15	FY16	FY17	FY 18	FY 19				
A	Domestic	4.3%	7.8%	2.8%	10.8%	4.67%	6.04%	0.00%	5 Yr CAGR	
B	Non domestic	3.1%	5.1%	4.5%	4.2%	4.43%	4.26%	4.26%	5 Yr CAGR	conservative approach
C	LIP	4.1%	3.9%	3.1%	-1.6%	5.18%	2.96%	2.93%	5 Yr CAGR	industries are being move out from Delhi and also due to stringent regulation
D	Agriculture	1.6%	8.1%	3.9%	-5.1%	3.14%	2.32%	2.22%	5 Yr CAGR	due to allow of 20KW AG connection
E	Public lighting	13.9%	15.9%	3.1%	-0.2%	4.04%	7.35%	0%		There shall be no growth in Consumption in FY 19-20, due to Energy Efficient Street Lights and replacement of un authorized area Street lighting with LED
F	Delhi Jal Board	0.3%	7.2%	4.6%	4.3%	1.71%	3.63%	3.60%	5 Yr CAGR	shortage of water supply from Haryana
G	Railway Traction	-8.2%	1.5%	-0.1%	4.1%	7.03%	0.87%	0	No Consumption (deemed licenses)	
H	DMRC	-16.3%	4.8%	6.7%	0.0%	3.81%	-0.20%	4%	1 Yr CAGR	All the lines are Operational, Hence the growth opportunities are limited. DMRC has already made request for open accesses application and also developing solar generation system.
J	Advertisement & Hoarding	4.0%	146.5%	-36.7%	21.7%	-23.33%	22.41%	5.0%		No Growth due to Negative Growth
K	Others*	-14.6%	-4.7%	-7.8%	6.1%	-3.60%	-4.93%	0%	5% Growth shall be considered on E-Rickshaw due to regularization of E-Vehicle and no growth is considered on Temporary due to stringent regulation	No Growth due to Negative Growth
L	Open Access charges offered as Non-Tariff Income									
	Total	3.2%	6.0%	3.1%	5.2%	4.57%	4.40%			

Table – 9.3: Consumer Growth Projection

		FY15	FY16	FY17	FY 18	FY 19	Average Growth since last 5 year	CAGR for FY 20-21	Remark
A	Domestic	6.2%	5.0%	4.4%	4.5%	3.99%	4.8%	2.41%	5 Yr CAGR
B	Non domestic	-1.0%	4.5%	3.0%	3.6%	3.23%	2.7%	1.34%	5 Yr CAGR
C	Industrial	-3.4%	2.5%	1.2%	1.0%	0.23%	0.3%	0.15%	5 Yr CAGR
D	Agriculture	-2.8%	1.9%	0.5%	-1.4%	5.77%	0.8%	0.38%	5 Yr CAGR
E	Public lighting	585.6%	40.1%	-0.7%	0.9%	0.33%	125.2%	0.00%	
F	Delhi Jal Board	176.8%	-1.3%	-35.4%	50.4%	0.76%	38.3%	0.50%	1 Yr CAGR
G	Railway Traction	0.0%	0.0%	0.0%	0.0%	0.00%	0.0%	0	No Consumption (deemed licenses)
H	DMRC	33.3%	-25.0%	33.3%	0.0%	0.00%	8.3%	0.00%	1 Yr CAGR
J	Advertisement & Hoarding	-8.1%	43.8%	5.1%	-16.0%	-3.49%	4.3%	0.00%	
K	Others*	-12.5%	-3.1%	0.3%	4.2%	7.31%	-0.8%	0.00%	5% Growth shall be considered on E-Rickshaw due to regularization of E-Vehicle and no growth is considered on Temporary due to stringent regulation

Table – 9.4: Load Growth Projection

Sl.No	Categories	Y-O-Y Growth					Load		
		FY15	FY16	FY17	FY 18	FY 19	Average Growth since last 5 year	CAGR for FY 20-21	Remark
A	Domestic	12.3%	13.0%	8.2%	-23.5%	3.05%	2.6%	0.81%	5 Yr CAGR
B	Non domestic	-2.3%	6.3%	6.1%	3.9%	4.10%	3.6%	1.78%	5 Yr CAGR
C	Industrial	-5.6%	2.9%	1.2%	1.4%	2.09%	0.4%	0.18%	5 Yr CAGR
D	Agriculture	-17.7%	27.1%	8.7%	0.0%	12.00%	6.0%	2.47%	5 Yr CAGR
E	Public lighting	223.3%	-19.4%	18.2%	-0.9%	-18.97%	40.5%	-6%	Reason of Negative Load Growth
F	Delhi Jal Board	21.9%	0.5%	-3.9%	6.8%	1.64%	5.4%	0.82%	1 Yr CAGR
G	Railway Traction	32.8%	-1.2%	0.0%	0.0%	0.00%	6.3%	0	
H	DMRC	-21.2%	0.8%	9.7%	0.0%	0.00%	-2.1%	0%	
J	Advertisement & Hoarding		63.9%	0.0%	0.0%	-99.96%	-9.0%	0%	Reason of Negative Load Growth
K	Others*	-9.9%	8.6%	6.1%	-18.6%	-5.26%	-3.8%	0%	Reason of Negative Load Growth
	Total	5.8%	8.5%	6.5%	-12.2%	2.51%	2.2%		

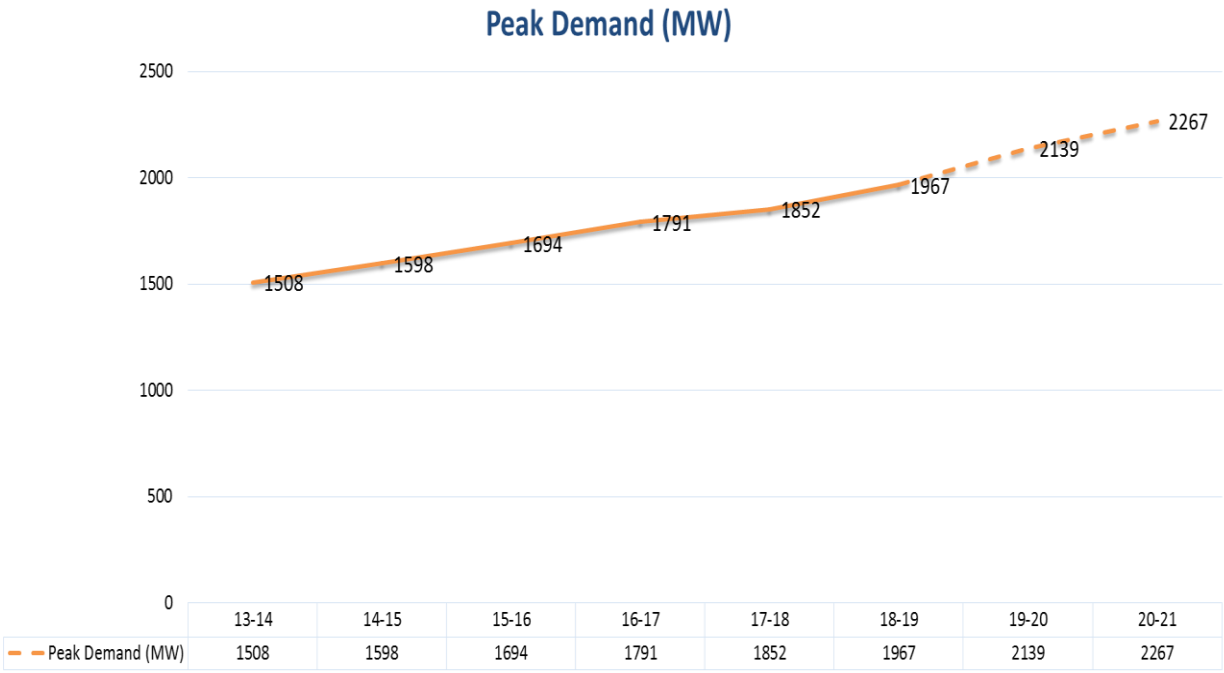

Figure – 8: Peak Demand Projection

In said Tariff projection activity based on Quantitative Forecasting techniques applied. The qualitative forecasting is based on past data trends i.e the history itself repeat itself. We are forecast the sale, consumer growth, peak demand and load growth based on past data trend. The AT & C loss as present 8 %. Accordingly the required revenue are deficit as projected approved amount of Regulator. The said

projections also help the identification of revenue gap after finalization of Tariff Order.

9.2.1 Collection Forecast:

Collection efficiency for FY 19-20 has been expected @ 99.50%. Based on the same, amount realized would be Rs 6,630.49 Crore.

Table – 9.5 : Expected Sales

Categories	FY 2019-20			
	Billed Units (M U)	**Fixed Charges**	**Energy Charges**	Total Revenue
Domestic	4,277.17	122.76	2,238.32	**2,367.07**
ND	1,578.07	218.49	1,421.14	**1,640.63**
SIP & LIP	2,389.59	249.08	1,945.03	**2,194.11**
Agriculture	14.34	0.73	3.78	**4.50**
Street Lighting	85.72	-	63.03	**63.03**
DJB	249.65	12.75	187.09	**198.84**
DMRC	151.05	5.98	94.64	**98.60**
TPDDL Own Consumption	21.08			**0.00**
Others	102.35	8.44	76.65	**85.80**
Total	8,855.02	618.11	6,014.38	**6,620.49**
8% Surcharge				**528.74**

9.2.2 Energy Requirement

Based on the Estimates, the demand for Power is expected to be as follows:

Table – 9.6: Expected Sales

Particulars	UoM	FY 19-20
Expected Sales	Mu"s	9643.5

The Distribution Loss in FY 19-20 is expected to be 8.0%. Based on the same, energy requirement works out as follows:

Table – 9.7: Energy Requirement

Particulars	UoM	FY 19-20
Expected Sales	Mu‟s	9643.5
Distribution Loss	%	1244 cr.
Energy Input	Mu‟s	10450.6

9.2.3 Carrying Cost:

TPDDL being aggrieved by the order of the DERC whereby TPDDL‟s contention to allow a accurate cost of capitals for the determination of carrying cost was rejected(Hon‟ble Commission having followed its practice based on arriving at a figure of 9% per annum based upon the Hon‟ble ATE order reported in 2007 ELR (PTEL) 1370).

Applicable extract of that order is imitated below

“The fixation of 9% carrying cost, in our view, is not suitable or appropriate. ***Therefore, the SEBs is hereby directed to reexamine the interest rate of carrying cost at the principal market rate and the carrying cost also to be permitted in the debt/ equity ratio of 70:30.****” (emphasis supplied)*

Table – 9.8 : Computation of Weighted Average Cost

	(Rs Cr)	Rate of Interest (%)	Interest (Rs Cr)
Loan*	70	10.90	7.63
Equity	30	16.00	4.80
Total	100	12.43	12.43

** Due to large revenue gap, Company has to take assistance of merchant bankers for arranging the loans for which fees is payable. As that is payable one time; hence same is not included above. Fees should be allowed separately at the time of truing up.*

9.3 NON COST REFLECTIVE TARIFF

A tariff component that is lower than the realization cost of generating, distributing, transmission and retail electricity supply. The difference between the tariffs most consumers pay and the actual cost is subsidized by the central and State Government. A cost reflective tariff is solitary which reflects the actual supply cost of electricity and removes the dependence on State Government subsidies to cover the difference between the existing tariff and the exact supply cost of electricity. The state govt. can provide cross subsidies to the disadvantaged sections or communities of the society but the tariff component should gradually imitate the actual supply electricity cost and this is amalgamated in the EA, 2003 which states the elimination and reduction of the cross subsidies surcharges within a timeframe manner by the Regulatory Commissions.

9.4 COST REFLECTIVE TARIFF

The preamble for formation of the CERC and SERC, “rationalization of electricity tariff”, transparent guidelines concerning subsidy, promotion of efficient and environmentally benign policie”.

Between 1948 and 1998 there not a rationalized tariff were present in India and were there irrationalized tariff present and were there irrationalities in the Tariff. There was no codified tariff principles for bulk, transmission and retail electricity tariff.

The rationalized tariff could not be achieved due to skewed political. Tariff charges not suitable cross subsidized nor provided for the government. Following points are related to Tariff:

i. Variable cost including fuel cost or losses
ii. Fixed cost, laying down the parameters of capacity cost
iii. Normative debt/equity ratio
iv. Made in instrument for appreciations through a tariff period
v. Steadiness and predictability of tariff over a rational “period of time”

Central public sector are responsible for reforms which improve the , initially the central government resorted to pricing without setting out the principles, Tariff was determined station wise on case basis. The central government in the case of central generating companies and state governments in case of state-owned generating companies were vested with the power to determine the tariff. There was no concept of reasonable return applicable to these generating companies. The government the 100 percent shareholder had the privilege of sitting in judgment over the reasonableness of tariff.

The real distortion however started after 1991 with a series of tariff decision ostensibly to attract private investments but eventually ending in a bonanza for the PSUs. This measure have given the death blow to SEBs already cracking under their own weight of inefficiency and political intervention. The gross product has been protruding liquidity combined with huge outstanding receivables from SEBs in the balance sheet of the PSUs. The reason why private investment did not take off is not seek. No businessperson can afford to throw good money after bad money. Investment cannot be devoted based on the demand on the demands of a bankrupt consumer.

9.5 Concluding Remarks

In this chapter the components of an ARR of a typical DISCOM, TPDDL in our case, will be discussed in detail. We define ARR concept. The ARR requirement and ARR petition filling on annual basis, but it time consuming activity. The projections and forecasting activity not provide an actual gap. In current scenario, COVID Pandemic situation, discoms faces high revenue deficit because input power is sufficient but usage is very low. Similarly seasonal load create a variation in distribution sector. The projection of power is not meet the actual condition or requirement of Discoms.so that we are suggested the real time monitoring is favorable in comparision to annual process. The next chapter focus on Tariff modelling and

provide the specific conclusions and suggestion.

CHAPTER -10

Tariff Rationalization

10.1 Electricity Tariff

The tariff is that the process of charging a customer for consuming electrical power. The tariff covers the entire cost of manufacturing transmission and distributing an electrical energy plus an affordable cost. Tariff system takes under consideration various factors to calculate the entire cost of the electricity as charge, Variable Cost Surcharges and Tax's.

Tariff Rationalization

The State Regulator should regulate tariff in decide as the electricity tariff gradually replicates the supply cost and also diminishes "cross subsidies". The key intentions of setting up the Sate Electricity Regulatory Commissions is "rationalization" of tariffs. This can be a critical activity, because the tariff assembly is outstanding by high "levels of cross subsidies" and number of customer cat. and slabs. The Regulator to notify plan with a objective that latest by the completion of each year, the tariffs are within ± 10 % of the supply cost.

Rationalization of tariff also depends the following as below.

i. Justification of generation & transmission tariff;
ii. Development of customer segment-wise tariffs;
iii. Compilation of cross subsidy decrease target and compliance required for implementation of tariff policy.
iv. within ± 10 % of the cost of supply;
v. Identification of Revenue gap on yearly basis
vi. Actual revenue recognition;
vii. Gap b/t Supply Cost and Tariff;
viii. Yearly Profit/losses statement etc.

Majority of the SERs are currently considering the ACoS for identification of tariff in every category instead of voltage wise statistics accessibility from the utility. However, a some of the State Electricity Regulatory Commissions as APERC, DERC and AERC have moved to voltage wise Supply Cost for identification of each segment of customer.

We are analze the different SERC Tariff as table 10.1, following table shows that complexity of Tariff structure and slab.In Delhi 9 Tariff categories in comparision to other states but different slab in diffent categories which create non uniformity of Tariff.

Table 10.1 Tariff comparison in major Metro Cities on Category / Slab wise Rates/unit

Metro Cities (Consumption Slab Wise)	**C.I.** ***kW/ kVA***	**Cons** ***Unit***	**kW/KVA /Month**	**FC** ***Rs/ Month***	**EC** ***Rs/KVA/Kwh***	**Bill Amt. from FC**	**Bill Amt. from EC**	**Total**
Delhi								
2 kW 0-200	2	200	20	40	3	40	600	640
2 kW 301-400	2	400	20	40	4.5	40	1500	1540
ND upto 3KW - 1500	3	1500	250	750	6	750	9000	9750
ND above 3KVA - 1500	4	1500	250	1000	8.5	1000	12750	13750
IND - 1500	4	1500	250	1000	7.75	1000	11625	12625
Kolkata- CESC								
2 kW 0-200	2.1	200	15	32	6.5	32	1291.8	1323.3
2 kW 301-400	2.1	400	15	32	7.3	32	2916.8	2948.3
ND 10 kW - 1500	10.5	1500	24	252	8.7	252	13030.8	13282.8
IND 10 kW - 1500	10.5	1500	50	525	6.9	525	10420	10945
IND 100 kW/108 kVA (HT)- 15000	108	15000	384	41472	6.5	41472	97350	138822
Bangalore- BESCOM								

Metro Cities (Consumption Slab Wise)	**C.l. *kW/ kVA***	**Cons *Unit***	**kW/KVA /Month**	**FC *Rs/ Month***	**EC *Rs/KVA/Kwh***	**Bill Amt. from FC**	**Bill Amt. from EC**	**Total**
2 kW 0-200	2	200	90	90	5.3	90	1051.5	1141.5
2 kW 301-400	2	400	90	90	6.3	90	2516.5	2606.5
ND 10 kW - 1500	10	1500	60	600	8.5	600	12700	13300
IND 10 kW - 1500	13.4	1500	45	603	6.1	603	9125	9728
IND 100 kW/108 kVA (HT)- 15000	108	15000	210	22680	6.7	22680	99750	122430
Uttar Pradesh								
2 kW 0-200	2	200		200	5	200	1005	1205
2 kW 301-400	2	400		200	5.4	200	2165	2365
ND 10 kW - 1500	10	1500		4300	7.9	4300	11850	16150
IND 10 kW - 1500	10	1500		2750	7.4	2750	11025	13775
IND 100 kW/108 kVA (HT)- 15000	108	15000		43200	8.3	43200	123750	166950
Himachal Pradesh								
2 kW 0-200	2	200		50	4	50	806	856
2 kW 301-400	2	400		50	4.4	50	1776	1826
ND 10 kW - 1500	10	1500		4300	7.9	4300	11850	16150
IND 10 kW - 1500	10	1500		110	4.7	110	7050	7160
IND 100 kW/108 kVA (HT)- 15000	108	15000		45900	4.1	45900	61500	107400
Rajasthan-JVVNL								
2 kW 0-200	2	200		220	5.6	220	1122.5	1342
2 kW 301-400	2	400		265	6.1	265	2432.5	2697
ND 10 kW - 1500	10	1500		1050	8.6	1050	12860	13910
IND 10 kW - 1500	10	1500		650	6.3	650	9450	10100
IND 100 kW/108 kVA (HT)- 15000	108	15000		19980	7.3	19980	109500	129480

Metro Cities (Consumption Slab Wise)	C.I. *kW/ kVA*	Cons *Unit*	kW/KVA /Month	FC *Rs/ Month*	EC *Rs/KVA/Kwh*	Bill Amt. from FC	Bill Amt. from EC	Total
Chennai								
2 kW 0-200	2	200		20	2.8	20	550	570
2 kW 301-400	2	400		25	5	25	1980	2005
ND 10 kW - 1500	10	1500		1400	8.1	1400	12075	13475
IND 10 kW - 1500	10	1500		700	6.4	700	9525	10225
IND 100 kW/108 kVA (HT)- 15000	108	15000		37800	6.4	37800	95250	133050
Haryana								
2 kW 0-200	2	200		125	4.7	125	937.5	1062
2 kW 301-400	2	400		125	5.4	125	2145	2270
ND 10 kW - 1500	10	1500		2350	7.1	2350	10575	12925
IND 10 kW - 1500	10	1500		1850	6.4	1850	9525	11375
IND 100 kW/108 kVA (HT)- 15000	108	15000		18360	6.7	18360	99750	118110

Based on tariff modelling for different states, we are identify the anomaly of tariff slab, one consumer pay more than other only basis of fixed charges, in case usage of energy less than the other. We also made telephonic discussion with Tariff determination problem in different utilities in Indian Power Sector, as per current scenario physical meeting or interaction is not possible due to COVID Pandemic. As per discussion and study of legal regime of power sector, we are proposed few suggestion based on Tariff Rationalization study.

Proposals on "Tariff Rationalization" are as follows:

10.2 Reliability Charges to be levied on high end consumers:

DISCOMs have incurred an outsized cost to strengthen the present network so on meet customer's demand. it's very critical for the utility to manage the peak load so as to accomplish the grid stability and to produce un-interrupted power to all of customers.

DISCOMs have now accomplished to reinforce the consistency of power supply to such an point that even the need of dealing alternative power supply arrangements e.g. through solar power, wind power, diesel genset, Battery storage system etc. by the customers have gone down significantly.

Therefore, it's been proposed that the DERC should introduce "Reliability charges" as a separate component of tariff, that will be applicable to industrial and commercial customers having high consumption of electricity. These consumers spending Rs 10-12/- per unit to possess nonstop supply by working and continuing personal DG sets etc. and DISCOMs are safeguarding reliability of supply so customers don't must use sets. Therefore, their expenses for reliable supply are reduced substantially.

This will also protection the low or domestic category customers so they're not subjected to the burden in kind of higher tariff rates. These consumers weren't spending such high amounts for safeguarding reliable supply.

Domestic Consumers

Though, the discom would like to revise the existing arrangement for the first two slabs of domestic category, it has been proposed first two slab limit to 0 to 200 units and next slab 200 to 600 units. It has been proposed to introduce a new third slab from for high end customers who are consuming more than 600 units per month. This will be separate to Reliability charges. TPDDL has proposed a reliability charge in the region of Re. 1/-.

10.3 HT Metering

a. DERC has been requested advance and smart HT metering concept may be compulsory for all 11 kV and above Customers (with load more than 60 KW).

b. It has been further suggested that buyers on HVDS Sharing a frenzied transformer, is also given above 11 kV consumers an extra 3% rebate providing and HVDS helps the discom for reducing technical losses, improve transformer loading, life of HVDS more so that it reduce maintenance cost and improves voltage profile, Sag and Swell, hence, ensuring steadiness and consistency of supply, and reducing the possibility for theft.

10.4 "Uniform Fixed Charges till the load of 5.0 kilWatt":

As present there are two slabs of fixed charges below 5 KW the mostly of customers are are with the SL of but 2.0 kW, but in case CL is far quite 2.0 kW. It gives unnecessary partiality bias towards those customers who haven't augmented their load to the particular CL, while the Customers of additional load are disbursing the fixed cost.

To avoid this tariff anomaly, the Regulator may reorganize the fixed charges for the domestic class so that constant fixed charges are charged till the load of 5.0 KW .

10.5 "Uniform Fixed Charges" above the load of 10. kilWatt:

Presently there are three slab of fixed charges above 10 KW, majority of high end consumers are exist in that slab. High end domestic consumer pay more comparison to low end consumers. To avoid the tariff irregularity, the Regulator may reorganize the fixed charges for the domestic group same as non domestic categories. So uniform fixed charges will be levied above 10 KW domestic Consumers.

10.6 Billing for industrial & NDLT customers with SL above 10 KW and MDI higher than 100 KW

It is worthy of mentioning that that genuine customers having SL quite 100 KW and MDI being but capable SL have gotten unreasonably loaded with higher tariff slab whereas dishonest Customers who are having SL but 100 KW and MDI being quite 100 KW, who find yourself disbursing reduced tariff, even after 20% addition charges for load violation, which isn't fair for honest customers.

For example, assume, one unscrupulous industrial consumer at LT with sanctioned load of 80 KVA and MDI of 120 KVA whereas another honest industrial Consumer at LT with sanctioned load and MDI both being 120 KVA.

Table – 10.2 : Comparative of correct (Consumer A) and incorrect (Consumer B) sanctioned load

Particulars	Consumer A	Consumer B
Sanctioned Load (in KVA)	80	120
MDI (in KVA)	120	120
Units (in KVAh)	15000	15000
Applicable Fixed Charges(in Rs./KVA/month)	70	150
Applicable Energy Charges(in Rs./KVAh)	5.5	6.5
Fixed Charges Payable (including 30%Load Violation charges) (in Rs.)	9240	18000
Energy Charges Payable (in Rs.)	82500	97500
Total Charges Payable (in Rs.)	**91740**	**115500**

As can be seen from above illustration, the unscrupulous Consumer A ends up paying much lesser than the honest Consumer B, even after the levy of Load Violation charges. Accordingly, keeping the above rationale in view, it is requested that for such cases, where the MDI cross above 100 KW for NDLT and LIP customers whereas SL is a smaller amount than 100 KW, utility should be permitted to re-categorize to the following catg. and levy tariff as appropriate for Industrial and commercial Consumers at LT with load quite 100 KW.

TPDDL is facing severe difficulty in raising the fund for refinancing of existing loans and financing of revenue gap and also the interest rates are on very high rising trend which

is driven by a combination of factors like economy development, borrowers financing health, statutory body directives like RBI, Ministry of Finance and nature of sector etc. These rates of interest driving factors are not controllable in the hands of TPDDL, therefore, allowing interest on normative rate of interest is unjustified and DERC may relax the same provision in exercise of its powers under regulation 12.3 and 12.4 of MYT allow genuine rate of interest. It is clarified that as per new MYT Regulations the Hon'ble Commission considers Rate of interest to be permissible on Base Rate only, however interest rate is always charged based on Base Rate plus a Spread where both the component are variables and not controllable in the hands of borrower. Spread is a factor which is decided based on lender's internal rating assigned for borrower and depends on various parameters like financial health of the company, risk associated with it, sector, sponsors etc, therefore the Hon'ble Commission should also consider Rate of interest based on Base Rate and Spread both and not only based on Base Rate.

10.7 Absence of cost reflective tariffs, the discom has requested that the Hon'ble Commission may consider and allow:

a) For uncontrollable cost mainly Power buying cost it is projected that the DERC should consider application of monthly or define a formula automatically adjustment of power purchase cost on monthly basis as against merely a fuel charge adjustment surcharge formula. Execution of said formula would be helpful for customers as no carrying cost is forced on retrieval of monthly differential power purchase cost and therefore it resulted saving customer cost.

   Hence, it would be prudent if the DERC approves Power Purchase Price Adjustment (PPPA) mechanism taking all elements of net power purchase cost, so that the consumers are not burdened exceedingly at the completion of the year and would refer accurate and timely monetary signals of real prevalent cost of power being provided to him. Needless to mention that such an adjustment will also help TPDDL in managing its Cash-flows better and would help reduce the cost of debt in long term. This would also obviate the need for large tariff increases in future.

TPDDL, therefore sent the proposal to DERC to approve a mechanism for pass through of variation (both plus or minus) in entire power purchase costs, at quarterly intervals. It is pertinent to point out that similar power procurement price adjustment mechanisms are already working smoothly in other States including Maharashtra, West Bengal, and Haryana & Gujarat.

b) Corresponding to the amortization schedule for recognized revenue gaps, it is suggest that a surcharge may be determined by the DERC by way of a percentage of the tariff which surcharge should continue to be applicable till such time the pas revenue gaps are totally recovered with carrying cost.

10.8 Tariffs still too complex

As per our objectives, In India there are numerous categories and sub-categories/slabs in the tariff structures, with no consistency among states, adding to the complexity as indicated in the table below

Table – 10.3 : Different State Tariff structure categories

	Haryana	Punjab	Rajasthan	Gujarat	Karnataka	West Bengal	Delhi
No of categories	15	17	8	18	12	9	9
No of categories	45	43	25	34	62	72	14
No of categories	Moderate	Moderate	Simple	Moderate	Complicated	Complicated	Simple

Tariff structure may be simple and easily define the goal of utility. As per above table, Delhi Tariff is simple and less complex comparison to other Indian states. The simple tariff structure are easily understood the common peoples they are participate in finalization of electricity tariff and provide their comments. In complex tariff scenario, regulator take more time for finalization and not properly comply the Legal frameworks. The Tariff finalization take 2 or 3 year instead of one year. The overhang cost of

Distribution utilities increase day by day. Resulting increase tariff and overburden the cost. Besides, states follow a different mechanism to recover costs, apart from a two-part structure such as the concept of monthly minimum charge for domestic consumers which is still prevalent in some states.

10.9 ABR Interpretation

ABR = Total Amount Billed / Total Energy Billed

One of the significant providers to India's temperately small positions in most affordability catalogues is the burden of huge cost and surcharges to industrial and non domestic segment instead of domestic consumers, which is an outcome of the financial requirement to balance the subsidy on account of domestic and agriculture consumers. Tariff rationalization involves variable tariffs to cost, typically by dropping the gap b/t subsidized and subsidizing parts.

Utilities with an outsized gap were way more likely to own worsened over the utility condition for mention years; this association looks to be amongst the sturdiest. On the opposite hand, the bottom gap recorded in FY 2004-05 have achieved a loss decrease or gap. The edge b/w the ACoS-ARR gap under the variation seems to becomes arbitrary across the company is about 60 pais./unit. Amongst the processes we arrange, this is often about the sole one with a supply cost element. Power purchase costs, i.e., the price of procuring power from bodies account b/t 30 to 80% total expenses of licensee.

Table – 10.4 : Average Cost of Supply comparative to realization cost

S.No.	Category	ACoS	ABR	Difference	Ratio of ABR to ACoS
A	Domestic	7.32	4.96	2.36	67.76%
B	ND	7.32	10.92	-3.6	149.18%
C	LIP	7.32	9.33	-2.01	127.46%
D	Agriculture	7.32	3.9	3.42	53.28%
E	Public Utilities	7.32	6.84	0.48	93.44%
F	Advertisement & Hoarding	7.32	11.69	-4.37	159.70%
G	E-Vehicle Charging Stations	7.32	4.92	2.4	67.21%

This ordinary cost, comprehensive of Discom incomes, is to be recuperated by the customers. Any retail cost below the value of Supply or ACoS doesn't shield costs. There's a little screw during this calculation: since total customer costs comprise of fixed cost plus variable cost of the connection and value of the energy consumption, correspondingly. we've used comprehensive ₹/kWh in our calculations in possible extent, is such as the common Billing Rate (ABR). In line with the current practices, domestic customers are charged an ABR under this cost to produce. Similarly E-Vehicle, Utility and Agriculture customers are charged an ABR under Cost of Supply compare to key customer tariffs segment informed the common Cost of Supply.

10.10 Need to be improve Financial Viability through Energy accounting

As per my proposal, the time-bound agenda should be strained up by the SERC for separation of AT &C losses through energy accounting on regular basis. Energy auditing should be done and completed in time bound period and declaration its results in every distinct period. The Prudence check of Discoms should be conducting on quarterly basis. Draft an plan on annual basis with stringent guidelines, the advance tools and machinery also required for reduction of loss. In case huge investment are required. The Electricity sector more backward condition in current time estimated overhang in delhi is 8000 cr. So that stringent regulation and reforms are required for improvement in said segments. So that the financial viability in distribution sector improves.

10.11 Review the applicability of fixed charge and its coverage to meet fixed obligations

Under the present regulatory framework to promote competition through Open Access, if the tariff components (fixed and variable) do not reflect the proportion of their liabilities, there will always be an “under-recovery” of the fixed cost by the discoms, leading to the fear of losing a high-paying consumer. Therefore, fixed charge recovery for subsidized consumers’ needs to be considered in order to get the right compensation.

10.12 Implement USO (Universal Supply Obligation) and DBT (Direct Benefit Transfer) for domestic consumers in a phased manner

In order to improve the cash deficit and efficiently implement Universal supply obligation (USO), subsidy for targeted consumers could be paid through State budget, unswervingly to the customers through DBT. This ca. help improve accountability, reduce delays, and deliver subsidy to consumers more efficiently. The DBT help to identify the consumer involve in theft activity. In case AT &C and T& D losses reduce and overburden of revenue gaps will be overcome. Each consumer mapping through GIS with the help UID. We are favour of DBT.

10.13 Cross-subsidy needs to be follow as per the Draft NTP 2016, and the EA, 2003,

Despite structural reforms, the tariffs determined for discoms still do not reflect the cost of supply, owing to high AT&C losses and regulatory assets created due to partial approval of the actual cost. Instead of penalizing the discoms/utilities due to not meeting the AT&C loss targets, SERCs have relied on creating regulatory assets. The gap in tariff versus cost has led to a high proportion of short-term loans to meet the power requirement. The issue has escalated, and has become unmanageable for discoms. The financial strength of utilities can also be associated with the consumer/ category mix in the tariff structure/orders. Higher the industrial customers, better the realization. Larger the number of subsidized consumers count or consumption, bigger is the cash crunch owing to delay in realization from customers and government providing the subsidies and grants. Apart from this, the involvement of such customers in total revenue is negligible, compared with the effective voltage-wise cost of supply of consumers

The root cause of obstacles in leading competition can be linked to issues faced by utilities/discoms – high number of subsidized customers; cash flow crunch, tariff and subsidy related issues; complicated tariff structure; and high AT&C losses component. These issues are by-products of ineffectiveness among utilities/discoms, which continue to acquire high operating losses even after multiple attempts of bail-out packages by the Centre and state governments. These issues have shuffled utilities/discoms in a vicious cycle of raising debt and losses. Even SERCs have been not able to take any bold decisions to help utilities/discoms

10.14.1 Concluding Remarks

Finally the entire study will be summarized in this chapter with specific conclusions and suggestion.

CHAPTER -11

Conclusions

With the entire Power Sector in Financial distress due to inadequate tariff wherein the Reserve Bank of India has also issued advice to the Banks to be extra cautious while lending to the Sector, it is becoming increasingly difficult to raise further Debt financing at any level of interest costs. Lenders have indicated that for them to consider refinancing / rolling over existing loans and/or providing further financing for covering increasing Revenue Gap, an indicative Revenue Gap amortization trajectory with annual recovery amounts, needs to be provided, so as to ensure certainty of recovery of their loans in a stipulated time frame.

A recent release by "CRISIL (*Exposure of Rs.560 billion at risk by March 2013 in the absence of reforms*)", rating agency, has also drawn caution while lenders have started restricting loans to fund state utilities, effective reforms process are must make progress which includes much needed tariff revisions.

The present tariffs structure are unsustainable and unpredictable, cannot produce desirable investments, drain assets, and are not battered at the deprived constraint. In its place, 100% metering infrastructure and supply procedures with unambiguous grants that are more prudently targeted are probable. Customer's preference for consistent supplies over subsidized and untrustworthy supplies. The indication that in India openly suggests that recovering acting States have more monetary pricing and lower cross-price subsidies and biases in tariffs component. Healthier tariff setting method thus goes with better concert and result.

Also, Utilities are required generate much higher cash flows to fascinate substantial investments in generating and transmission sector. It must be noted that there are no forthcoming foremost developments in the variables discussed in the study. The best way is to reduce AT&C losses further. Number of years into the reform effort, we believe that it is time to take stock of the effectiveness of reform measures.

An important aim of the study was to converge on the most granular portion of a typical

Power Distribution utility peeping right through the prism of the entire Power Sector of India, experimentation done in states like Delhi, success factors & the components of the ARR which finally forms the tariff of the retail Power Consumer.

The study demonstrations indication of only a feeble association b/t possession and effectiveness. It is significant to stand in mind that the more fruitful subset amongst the utility which have been privatized (i.e., Delhi) is a relatively nascent testing, which has still succeeded to overtake many of its more established peer discoms, while having happening from a more deprived in preliminary circumstance.

It is worthwhile to mention that Indian Power Sector is far from being profitable. The revenue surplus is rare and deficit is in abundance. It will require a multi-dimensional reform process i.e. in terms of policies, technologies, financial handling, social commitment, demand-side management etc. to make it a profit-making and self - sustaining entity.

Issues	Recommendation
Rationalization tariff to reduce overall tariff component of industrial consumers and commercial consumers	Review the applicability of fixed and variable charge and its coverage to meet fixed and variable charges obligations Unless the tariff constituents (fixed and variable) are reflective of liabilities, discoms/utilities are face under-recovery of fixed charges. Discoms would opposed to open access regime, as it would mean losing high paying customers. Salvage of fixed charge for subsidized customers thus merits contemplation.
Simplification of tariff structure and cost-reflective tariff	Regulator Simplify the tariff structure. The tariffs set by State Regulatory Commissions for retail customers are multifaceted in nature, with many categories and sub-categories, which leads to confusion and anomaly not just at the customer level, stakeholder level as well as discom level. It is, therefore, suggested that tariff structures be reviewed and simplify as possible and revenue impartiality ensured. Prevailing tariff categories/slab may be merged/ eliminated based on the following moralities: a. End use b. Energy consumption, high or low c. Socio-economic factor/ affordability d. Social factors f. Voltage level

Issues	Recommendation
	g. Efficient energy
Universal supply obligation & subsidy delivery	Implement Universal Service Obligation and Direct Benefit Transfer for domestic consumers in a phased manner as per National Tariff Policy, 2016 DBT for targeted consumers, with direct payment through State budget allocation can help improve accountability, reduce delays, and deliver subsidy to consumers more efficiently.
High cross subsidy surcharge and additional surcharge	Have uniform methodology to calculate open-access charges & reduce cross subsidy The NPT 2016 clearly mandates that open access charges should not be so burdensome that it destroys competition. Recommending a uniform methodology for decisive supplementary surcharge and reevaluating parameter of the cross-subsidy formula as provided in the Tariff policy are also required. However the revision in NTP 2016 has permitted a higher cross subsidy surcharge. Hence the prevailing methodology under NTP 2016 which has permitted higher charges for OA customers' needs to be relooked at and device a uniform mechanism to re-evaluate surcharges charge should be developed. Further cross-subsidy charges for several industrial and commercial consumers is still higher than the prescribed limit of 20% of AcoS under NPT 2016. As per suggestion Commissions should follow the procedures in the policy and the Electricity Act 2003 to progressively reduce cross-subsidy surcharge
Reasons for OA rejection have no convincing ground	A OA rejection have no convincing ground issuance of clear recommendations on requirement and probable list of reasons for rejection. After an application is submitted, open-access customers faces rejections on frivolous grounds without proper clarification. This type of atmosphere discourages the high end consumers from applying for open access. Various steps which can statement this are: - Discom/ SLDC/utilities can provide Dos and Don'ts for customers applying for open access - Maintaining registry and translucent records

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Abbreviations:

A&G	Administration & General
ABT	Availability Based Tariff
ARR	Annual Revenue Requirement
ATE	Appellate tribunal for Electricity
BRPL	BSES Rajdhani Power Limited
BSES	Bombay Suburban Electricity Supply Company
BYPL	BSES YAMUNA POWER LIMITED
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CPRI	Central Power Research Institute
CPSU	Central Public Sector Undertaking
CRISIL	central public sector units
CTU	Central Transmission Utility
DERA	Delhi Electricity Reform Act
DERC	Delhi Electricity Reform Act
DISCOM	Distribution Company
DR	Distribution Reform
DVB	Delhi Vidyut Board
ER	Eastern Region
FMC	Forward Markets Commission
FTIL	Financial Technologies (India) Ltd.
GDP	Gross Domestic Product
GENCO	Generation Company
GFD	Gross Fiscal Deficit
GIS	Geographic Information System
GoI	Government of India
GONCTD	Government of National Capital Territory of Delhi
GSM	Global System for Mobile Communication
HVDS	High Voltage Distribution System
IPP	Independent Power Producer
JV	Joint Venture
LIP	Light Industrial Producer
MCX	Multi Commodity Exchange
MDI	Maximum Demand Index
MU	Million Units
MYT	Multi Year Tariff
NCDEX	National Commodity & Derivatives Exchange
NCT	National Capital Territory
NDLT	Non-Domestic Low Tension

NDMC	New Delhi Municipal Council
NDPL	North Delhi Power Limited
NEP	National Electricity Policy
NER	North-Eastern Region
NHDT	North-Eastern
NHPC	National Hydel Power Corporation
NR	Northern region
NTP	Northern Region
NTPC	National Thermal Power Corporation
NVVN	NTPC Vidyut Vyapar Nigam
O&M	Operations & maintenance
OA	Open Access
OTS	Onetime Settlement
PGCIL	Power Grid Corporation India Limited
PPA	Power Purchase Agreement
PSU	Public Sector Unit
R&M	Repair & Maintenance
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCADA	supervisory control and data acquisition
SEB	State Electricity Board
SERC	State Electricity Regulatory Commission
SIP	Small Industrial Producer
SMS	Short Message Service
SR	Southern Region
STU	State Transmission Utilities
T&D	Transmission & Distribution
TPDDL	Tata Power Delhi Distribution Limited
TRANSCO	Transmission Company
UI	Unscheduled Interchange
USAID	U.S. Agency for International Development
WR	Western Region

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