CHAPTER 8
ANALYSIS AND FINDINGS

8.1 INTRODUCTION

In this chapter, the major findings and analysis of the research are summarized. The limitations of the study and suggestion for areas of further research are also enumerated. The chapter attempts to analyze the collected data to answer the research questions addressed in the objectives of the study. As an outcome of this exercise, the study validates the reform process undertaken in the Power distribution sector in terms of macroeconomic agenda of growth of the sector. This concluding chapter is organized in terms of two sections:

1. Summary
2. Concluding Remarks

8.2 SUMMARY OF THE WORK

Objectives of the Study Revisited

Objective 1: To study the status of Indian Power Sector before and after reforms in India

Reform in Power Sector has undergone in different stages of the early years of minimal regulation to state-dominated industry and old-style regulation to Commercialization and new-style regulation which is both extensive and intensive. While analyzing the India's economic development with reference to Power Sector and extensive chronicling of reform process in Power Sector as has been attempted in Chapter 3 & 4. The central and state governments have taken several initiatives to reform the power sector during the last decades. India's power sector reforms have undergone in three distinct phases broadly as regards to its regulation. The earlier focus on increasing generating capacity has been shifted to a more comprehensive reform approach with emphasis on SEB restructuring, unbundling, corporatisation and rationalization of tariffs through establishment of regulatory commissions and carry out other reforms leading to privatization of distribution.

The traditional structure of vertically integrated, state-owned monopolies changed and the conceptual framework underlying the new legislation opened to competition. The intention was that private participation in generation and distribution, in course of time in wholesale power trade, and with transmission also being opened to private investment; T&D (transmission and distribution) would remain localized monopolies, albeit with smaller areas. Exhibit No. 8.1 and 8.2 presents a graphic shot of the configuration of restructuring exercise in Power Sector during pre-post reform period.

Salient Positive Features of New Legislation

Exhibit No. 8.1: Pre–Reforms Features of Power Sector

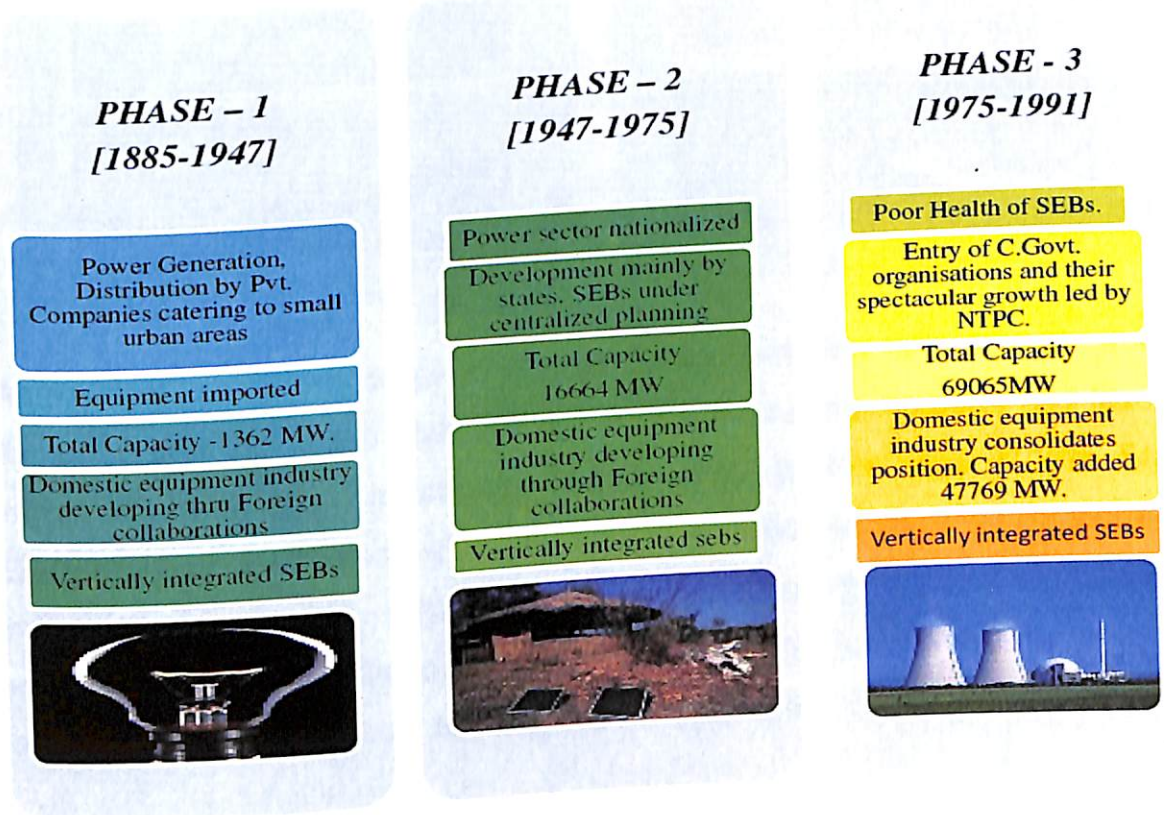
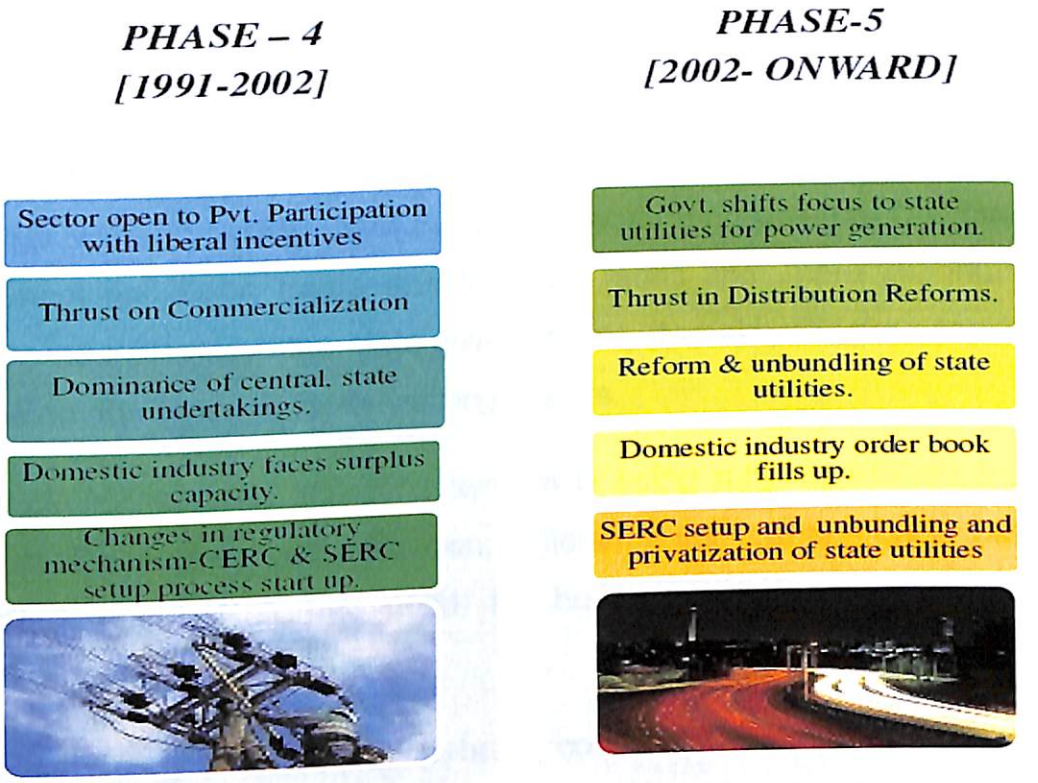


Exhibit No. 8.2: Post–Reforms Features of Power Sector



Analysis of the Chronology of Power Sector Reforms reflects that it was expected that the action plan outlined in the preceding chapters has lead to improvement in the operational and financial performance of the State Electricity Boards/Utilities with restoration of commercial viability with increase in private participation which would lead to efficient and optimum use of energy resources available in India and to supply quality power at good reliability and optimum cost to the Indian consumers.

Post reform power sector scene in India is reflected in respect of the following:

- Sector open to Pvt. participation with liberal incentives
- Govt. shifts focus to state utilities for power generation
- Thrust on Distribution Reforms.
- Thrust on Commercialization
- Reform & unbundling of state utilities.
- SERC set up and unbundling and privatization of state utilities

- Customer has come to occupy the centre stage of the marketing activity
- Number of players is higher than ever.

Our analysis and findings have borne out the fact that the reform process in the Power Sector has been progressing to bring more competition and transparency in line with the market forces along with states. An important feature of the process is that the policy reform underway in India is gradualist. Although ,with the setting up of the State Electricity Regulatory Commissions, an attempt has been made to rationalize tariffs and ,more importantly ,to insulate the SEBs from the state governments, it would still take considerable time before the process starts yielding results.

The socio-political and economic system is being subjected to much strong pressure for increasing competition, efficiency and transparency, but at a controlled pace. Reforms need to be pursued in a framework of macroeconomic stability.

There are many factors, which have contributed substantially to overall deterioration in the power sector. The analysis and study of reform process indicated that the neglect of management of distribution over a long period of time was probably one of the major causes. In future the Indian power sector should implement accelerated power reforms, especially in distribution sector and its return to commercial viability.

Objective 2A: Parameterization and measuring performance of Power distribution companies in Delhi against the identified Quality of Service parameters for operating efficiency and reliable power from the Consumer point of view during 2000-2007.

QoS constitutes one of the important performance parameters of a utility, which, besides consumer satisfaction, has a direct bearing on the safety and performance of plant and equipment. In the electricity supply industry, quality is particularly important: customers pay not only for the physical product which they consume, but also for the security of uninterrupted power supply which they expect to receive.

Chapter 7 examines the spectrum of Quality of Service and performance issues in international and national power sector its objectives, need and process. An analysis has been made to study the international and national experiences; process with respect to impact of reforms on quality of power supply. The analysis in Chapter 7 brings out the parameters for the Quality of service regarding operating efficiency and reliable power from the consumer point of view. After reviewing the earlier studies, it was analyzed that the intangible electricity should be earmarked with tangible components to judge the level of quality and benefits being received to the end consumers. The analysis was based on the information available in public domain – consolidated from the publications, and as highlighted in the Electricity Act, 2003 reviewing the international and national experiences and taking into account of stakeholders view, meetings with forum of regulators. In order to judge / depict the level of quality of service to the consumer can be broadly categorized for depicting quality of service into the following parameters:

2.A.1: Parameterization of identified Quality of Service parameters

a. Operational Parameters

i. Technical Parameters

- Voltage
- Reliability
- Overloading of Power Equipments
- Capacity Utilization and Enhancement

ii. Standard of Performance

- Consumer Complaint handling
- No. of Consumer Complaints
- New Connections/ Energisation
- Hours of Supply
- Level of Consumer awareness to the regulations like Electricity Act 2003 and Supply Code

b. Commercial Parameters

i. Meter reading

- Frequency and adherence to the time schedule of Meter reading

- No. of Faulty & Stopped Meters
- Usage of Advance Meter Reading Technology
- Spot Billing of Consumers having Faulty/ tampered Meter

ii. Billing

- Adherence to Time Schedule of Dispatch of Bills
- No. of Complaints for duplicate Bills
- No. of Complaints of Faulty Bills

iii. Collection efficiency

c. Dispute Resolution

i. Presence of CGRFs and at which level (Circle/ Division/ Sub-Division)

ii. Awareness of CGRFs and its working among Consumers

iii. Performance of CGRFs

- No. of members and their profiles.
- No. of independent members
- No. of cases registered vs. no. of cases resolved
- No. of cases in which compensation was being paid to appellant.

In the Indian context, even today affordable access is one of the major challenges for the distribution utility. Arriving at a right mix of performance indices with the optimum level of detail that can be supported by data and a monitoring system that will facilitate transparency, accountability & participation which help in the turnover of the utility. Therefore, regulatory measures to improve Quality of Service are necessary and welcome steps, helping the consumer to get better service from the utility.

Our analysis and findings based on the secondary data borne out the fact that at this initial stage, it is crucial that the distribution utilities and regulatory commissions show serious end to end commitment in the QoS process.

2.A.2: Measurement of the identified performance parameters of power distribution companies in Delhi

The above identified performance parameters have been analyzed for measuring the performance of power distribution companies in the Pre&Post reforms period. For the purpose of analysis in this research, the data were obtained from various stakeholders, data available in the public domain has

been considered. The performance parameters analyzed have been categorized as follows:

A. *Technical Parameters*
- Transmission and Distribution (T&D) Losses in Delhi Power System
- Transformer Failure Rate

B. *Commercial Parameters*
- Collection Efficiency
- Aggregate Technical and Commercial Losses
- Average Cost of Supply
- Average Revenue Realisation
- Receivables

C. *Operational Related to Quality of service*
- Peak Load Met
- Extent of Load Shedding

2.A.2.1: Pre-Post Reform Technical and Commercial Performance of Delhi Power Sector

A. *Technical Parameters*

The analysis of the technical parameters and performance of the Delhi Power sector has been discussed in the following section based on the restructuring process discussed in detail in Chapter 5.The pre reform commercial performance of DESU/DVB as shown in table 8.1 during the 1990s in particular DESU / DVB suffered a very poor public image for its quality of service, consumer relations and commercial performance. The T&D losses were appox 47.5% in 2000.As in other State Electricity Boards, human resources and financial management were weak and not oriented towards commercial performance. The high T&D losses and collection inefficiency were two of the major concerns of the Delhi power sector prior to reforms.

However even when, down to the early 1990s, DESU's T&D losses were at relatively acceptable levels, the retail tariff was insufficient to cover its costs

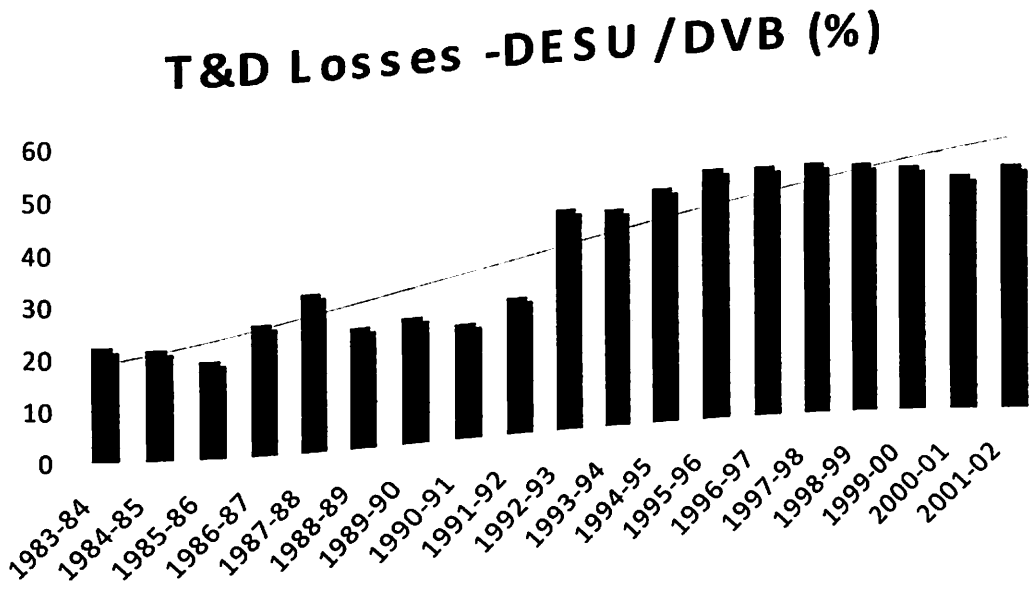
and DVB was unbundled in 2002.Table 8.1 shows the overall performance of Delhi Power Sector.

Table 8.1: Performance of Delhi Power Sector

	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93
T&D Losses %	22.16	21.56	19	25.43	30.78	23.49	24.46	22.33	26.5	42.66
Collection efficiency %	82.19	79.62	85.89	87.91	83.08	72.69	72.45	76.73	67.23	89.92
Revenue Realized (Rs. In Million)	1503.6	1829.6	2881.7	3282.3	3606.3	4560.8	5290.9	7011.6	8650	10720
Net Commercial Losses (Rs. In Million)	869.2	1005.9	407.4	1042.5	2261.6	2422	2416.3	2088.2	909.6	3287.9
Operating Deficit (Rs. In Million) (excl. Interest & Depreciation)	635.9	739.2	49.2	542.3	1658.1	1656.5	1999.4	1509.8	155	2163.8
Commercial Performance of DESU / DVB										
	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	
T&D Losses %	41.96	45.27	48.46	48.41	48.61	48.21	47.52	45.64	47.45	
Collection efficiency %	92.42	89.48	87.44	88.1	88.27	88.28	90.81	91	90.61	
Revenue Realized (Rs. In Million)	13227.8	15550.9	17119.5	19701.9	26991.4	30319.9	32667.5	35543.2	40047.3	
Net Commercial Losses (Rs. In Million)	2454.6	3265.5	5007.6	7097.4	5363.1	8334.7	8339.3	11044.1	11960.4	
Operating Deficit (Rs. In Million) (excl. Interest & Depreciation)	1141.4	1729.5	3543.5	4918.1	2819.8	5022.3	2927.2	4626.3	2480.4	

Note: DESU/DVB annual accounts audited up to 1990-91
Source: DISCOM Data 2008

Exhibit No. 8.3: Overall T&D Losses of Delhi Power Sector

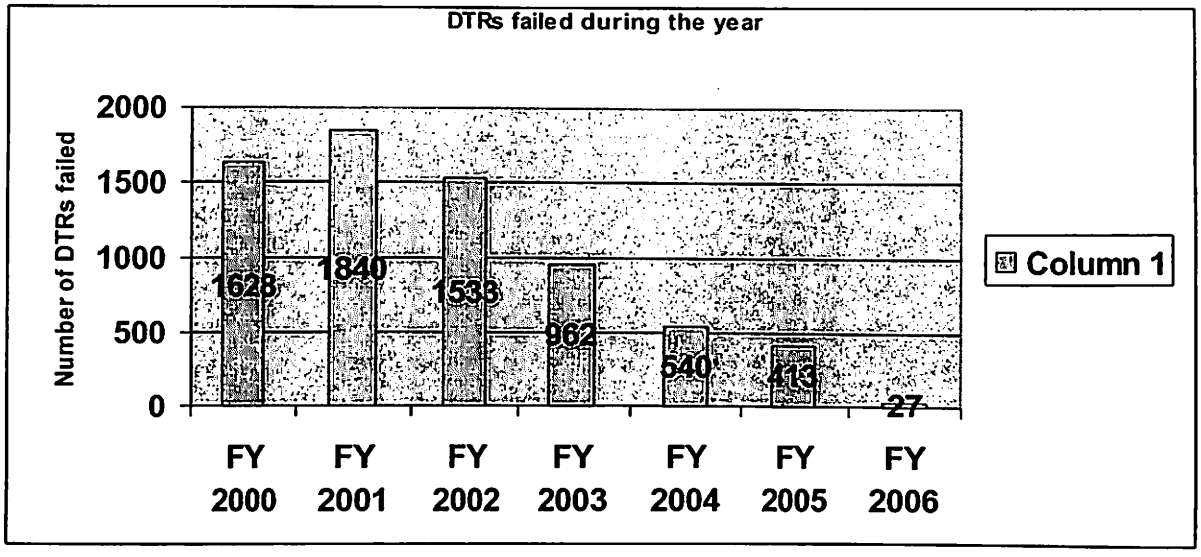


Source: DISCOM Secondary Data 2008

B. Post Reforms Technical Efficiency

The number of yearly Distribution Transformers failures during the period FY 2000 to FY 2006 and in recent years the number has declined significantly as given in Exhibit below:

Exhibit No. 8.4: DTRs failed during the year



Source: DERC Data 2008

The number of Distribution Transformer (DTRs) failures during the year has reduced significantly from 1533 in FY 2002 during pre-reforms period to 27 in FY 2006 during the post reforms period.

2.A.2.1: Pre and Post Reform Technical and Commercial Performance of DISCOMs

The Post reform commercial performance of three DISCOMs as shown in Table 8.2 after privatization and unbundling of DVB in terms of reduction of AT&C losses and improvement in collection efficiency. The bidding criteria adopted for privatization of distribution business was the reduction in Aggregate Technical and Commercial Losses (a combination of T&D losses and Collection Efficiency), as detailed in Chapter 5 of Delhi Refoms.

The overall T&D losses of Delhi Power Sector prior to reforms were in the range of around 46-47%, which has reduced to around 28.45% at the end of FY 2007-08. Further, the breakup of Transmission Losses and Distribution Losses during the post reforms period for the three DISCOMs is given in Table 8.2 below:

Table 8.2: Commercial Performance of DISCOMs

NDPL

Year	Units Input in MUs	Units Billed in Mus	Collection Efficiency (%)	Units realised in Mus	Distribution Losses (%)	AT &C Losses (%)
	1	2	5	6	7	8
2002-03	3927	2113.40	0.97	2050	46.18	47.80
2003-04	5552	3188.54	0.96	3061	42.57	44.87
2004-05	5549	3674.00	1.00	3674	33.79	33.79
2005-06	5695	4143.56	1.01	4185	27.24	26.51
2006-07	5986	4352.72	1.049	4566	27.29	23.72
2007-08	6277.27	4979.90	1.0281	5119.84	20.67	18.44

BRPL

Year	Units Input in MUs	Units Billed in Mus	Collection Efficiency (%)	Units realised in Mus	Distribution Losses (%)	AT &C Losses (%)
	1	2	5	6	7	8
2002-03	5568	3328.41	0.88	2929	40.22	47.40
2003-04	8096	4538.78	0.98	4448	43.94	45.06
2004-05	8405	5364.52	0.93	4989	36.17	40.64
2005-06	8648	5309.52	1.05	5575	38.60	35.53
2006-07	9122	5872.14	1.0887	6393	35.63	29.92
2007-08	9271.7	6406.62	1.054	6752.58	30.90	27.17

BYPL

Year	Units Input in MUs	Units Billed in Mus	Collection Efficiency (%)	Units realised in Mus	Distribution losses (%)	AT &C LOSSES (%)
	1	2	5	6	7	8
2002-03	3625	1684.15	0.82	1381	53.54	61.90
2003-04	5192	2471.88	0.96	2373	52.39	54.30
2004-05	5338	2803.16	0.95	2663	47.49	50.11
2005-06	5395	2802.78	1.08	3027	48.05	43.89
2006-07	5298	3059.29	1.0558	3230	42.26	39.03
2007-08	5283.2	3518.80	1.054	3708.81	33.40	29.80

Energy realised in MUs = Collection Efficiency *Energy Billed in MUs

AT & C Losses = 1 – (Energy realised in MUs / Energy Purchase in MUs)

Source: DISCOM Data 2008

B. The Transmission and Distribution Losses after

The transmission losses at TRANSCO level have reduced to 0.95% in FY 2007 as compared 2.0% in FY2003, which appears to be reasonable.

Table 8.3: Transmission and Distribution Losses

	Unit	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Total Energy Input to System		14260	20385	20841	23194	23517
Energy Input to Discoms		13121	18828	19292	21367	21769
Direct Sale by TRANSCO		854	1212	1178		1124
Transmission Losses	MU	286	345	370	153	208
Transmission Losses	%	2.00%	1.69%	1.78%	0.69%	0.95%

Source: DERC Data 2008

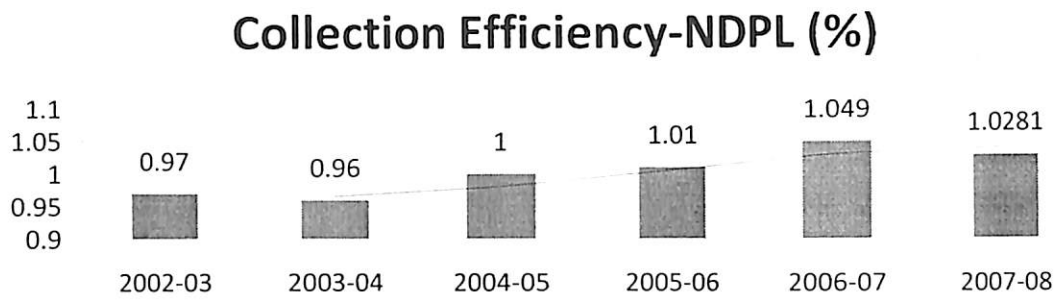
The Transmission & Distribution Losses for entire Delhi (i.e. BRPL, BYPL & NDPL areas) for FY 2006-07 is 34.9% and for FY 2007-08 is 28.45%.

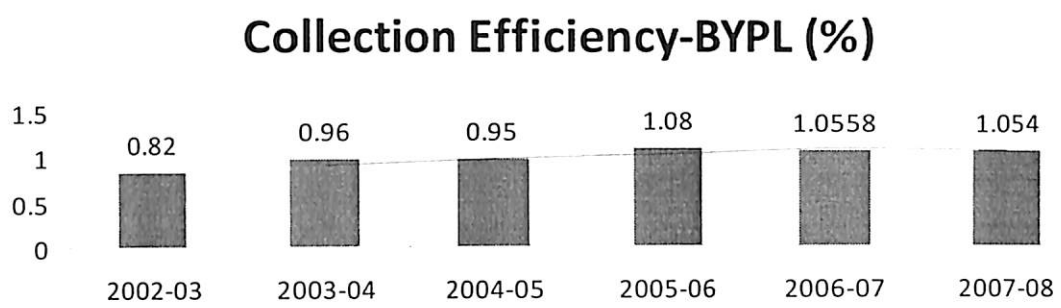
C. Commercial Parameters

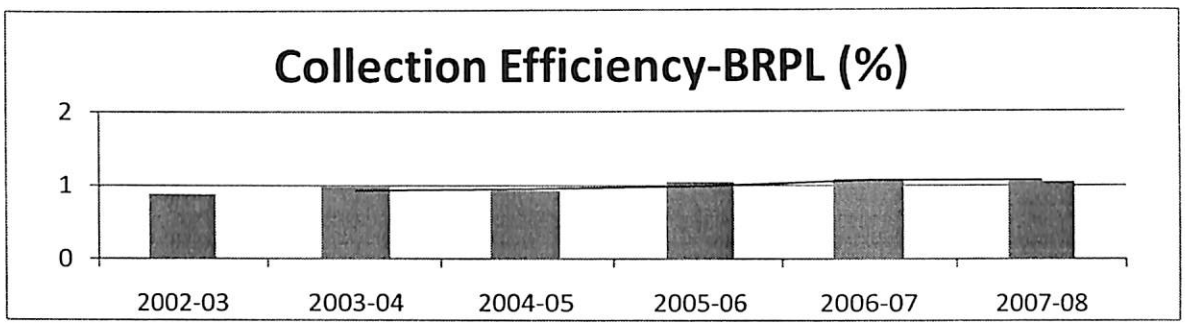
Collection Efficiency

The overall collection efficiency of Delhi Power System from FY 2000 to FY 2007 is graphically presented below in Exhibit 8.5 for the three DISCOMs.The problem in pre reform period was that SEBs were losing money not because they were not producing enough power, but they were not charging enough and collecting even less.They were losing more than one-third of the power they produced,or purchased,to theft and pilferage. More power sold, with average cost far exceeding average revenue per unit, meant more losses.There is unanimity on the metering for consumers of Delhi.

Exhibit No. 8.5: Overall collection efficiency of three DISCOMs







Source: DERC Data 2008

**Collection efficiency more than 100%includes collection of past arrears.

The overall collection efficiency, which was hovering around 90% in the pre-reforms period has increased to 100% in FY 2007 in post reforms period, which represents substantial improvement in collection efficiency. The Collection Efficiency has reduced in FY 03 as compared to FY 02 which may be attributable to the billing and collection problem during transition period from Government Owned Utilities to Private Companies .The DISCOMs were privatisated based on agreed level of reduction in Aggregate Technical and Commercial Losses (AT&C) losses, a combination of T&D Losses and collection efficiency, and the DISCOMs have tried to improve the collection efficiency to meet the overall AT&C loss level targets.

C. Post Reforms Operational Parameters

C.1 Generation

As outlined in Chapter 5 section 5.4 the transfer scheme provided for unbundling of the functions of Delhi Vidyut Board (DVB) into Generation, Transmission and Distribution. The existing Generation assets were transferred to Indraprastha Power Generation Company Limited (IPGCL). A new company, viz. Pragati Power Corporation Limited (PPCL) was also incorporated and the ongoing development of a Gas based Power Plant was transferred to this Company. The planned capacity of PPCL was 330 MW with two Gas Turbines and one steam turbine. The first Gas Turbine was commissioned in May 2002 and the second one was commissioned in November 2002. The combined cycle unit consisting of the Steam Turbine was commissioned in March 2003.

The Peak demand in Delhi has ranged between 3097 MW in 2002-03 to 42000 MW 2007-08 and with the total installed capacity with IPGCL and PPCL of approximately 994.5 MW, Delhi is highly dependent on other sources including Central Generating Stations to meet its power requirement. The performance of IPGCL and PPCL has been analyzed against key parameters since July 2002, the effective date of Transfer Scheme. The performance parameters analysed have been categorised as follows:

A. Technical Parameters

- Gross Generation in MU and Plant Load Factor (PLF) of the various stations.
- Auxiliary Consumption in MU and %.
- Net Generation in MU
- Station Heat Rate (SHR) for various stations.

B. Commercial Parameters

- Total Fixed Costs and Fixed Costs per unit of Generation
- Total Variable Costs and Variable Costs per unit of Generation
- Total Costs (Fixed and Variable) per unit of Generation

A. Technical Parameters

Gross Generation and PLF: The Gross generation for the Delhi stations has grown from 5019 MU in 2003-04 to 5200 MU in 2006-07. Coal based IP station has shown an improvement while Rajghat station has shown a reduction in the energy generated. Gas based stations, i.e., the Gas turbine station of IPGCL and PPCL have shown an impressive increase in the energy produced. This is because of the improved PLF for the Gas stations as is evident from data depicted in Table 8.4 below.

Table 8.4: Gross Generation

Gross Generation (MU)	2002-2003*	2003-2004	2004-2005	2005-06	2006-07
I.P. Station	460	769	920	985	911
Rajghat Station	695	774	697	574	629
Gas Turbine Station	916	1214	1540	1748	1407
PPCL	780	2262	2552	2296	2253
Total	**2851**	**5019**	**5709**	**5603**	**5200**

Source: DERC Data 2008

All the stations have performed consistently over the years and have maintained same levels of auxiliary consumption. This could be attributed to both the age of the plants and the lack of regular R&M activities.

- Station Heat Rate: Station Heat Rate is the term used to indirectly measure the thermal efficiency of the plant by depicting the quantity of heat required (in terms of Kilocalories) to generate one unit of electricity. As per the CERC norms, SHR for Coal based plants and Gas based plants should be in the range of 2500 kCal/kWh and 2000 kCal/kWh, respectively. However, the IP station and the Rajghat stations have an SHR of more than 3300 kCal/kWh, which can be attributed to the vintage of the plants. IPGCL has however improved SHR for Rajghat station as is evident from the data submitted by it to the Commission. Even for the Gas turbine station of IPGCL, the SHR has deteriorated for FY 2006-07 as compared to FY 2002-03. The high value of SHR for PPCL in 2002-03 was due to the fact that 2002-03 was the stabilization period and the plant was fully commissioned only by March 2003. Table below depicts SHR for various stations of IPGCL and PPCL.

Table 8.5: Station Heat Rate

Station Heat Rate (kCal/kWh)	2002-2003*		2003-2004		2004-2005		2005-06		2006-07	
	Actual	Approved by Commission	Actual	Approved by Commission	Actual	Approved by Commission	Actual	Approved by Commission	Actual	Approved by Commission
I.P. Station	3448	3235	3488	3235	3633	3235	3493	3235	3802	3235
Rajghat Station	3539	3200	3460	3200	3379	3200	3586	3200	3210	3200
Gas Turbine Station	2346	2346	2346	2346	2407	2303	2426	2450	2734	2450
PPCL	2807	2807	2000	2000	1765	2000	2018	2000	2035	2000

Source: DERC Data 2008

B. Commercial Parameters

Total costs of Generation: The total per unit costs of generation from IPGCL and PPCL are given in Table below. The total per unit cost of IPGCL station for FY 2005-06 works out to Rs 2.97/kWh, while for PPCL it works out to Rs 2.02/kWh

The overall generation from the generating stations of Delhi particularly IPGCL and PPCL have increased substantially. Further, the average cost of generation has also increased which is mainly attributable to increase in the fuel prices.

Table 8.6: Total costs of Generation

Total Costs (Rs. / kWh)	2002-03	2003-04	2004-05	2005-06	2006-07
IPGCL	1.85	2.04	2.12	2.73	2.97 (IP)
					2.97 (RPH)
					2.18 (GT)
PPCL	2.62	2.10	1.97	2.13	2.02

Source: DERC Data 2008

Capital Expenditure and Improved Infrastructure

The Distribution Companies have been pursuing an aggressive capital expenditure (Capex) program since the infrastructure inherited from the erstwhile Delhi Vidyut Board (DVB) was in a dilapidated condition. Expenditure on Capex has helped in reducing both technical and commercial losses. The

following Table gives an idea of the magnitude of year-wise expenditure incurred since 1st July, 2002 to 31st March, 2007 as approved by DERC in Tariff Orders for all three Distribution Companies (DISCOMs) and DTL.

Table 8.7: Capital Expenditure and Improved Infrastructure

(Rs. Crore)

Period	BRPL	BYPL	NDPL	DTL	TOTAL
2002-03	76.38	56.36	48.51	43.47	**224.72**
2003-04	112.00	85.34	287.13	85.25	**569.72**
2004-05	525.82	405.25	328.42	108.05	**1367.54**
2005-06	308.95	316.41	318.70	75.28	**1019.34**
2006-07	270.94	223.69	209.88	100.00	**804.51**
Total	**1294.09**	**1087.05**	**1192.64**	**412.05**	**3985.83**

Source: DERC Data 2008

There has been sufficient addition to the infrastructure such as power transformers, EHV cables, installation of distribution transformers, installation of 11kV feeders, installation of shunt capacitors, etc. by the Distribution Companies and corresponding augmentation of Grid & Grid stations has been undertaken by DTL.

TRANSMISSION

The restructuring process in Delhi the transfer Scheme provided for unbundling of the functions of Delhi Vidyut Board (DVB) into Generation, Transmission and Distribution. The existing transmission assets were transferred to Delhi Transco Limited. Since July 2002, TRANSCO has been performing the functions of the Transmission Company, System Operator and Trading Company in Delhi. TRANSCO buys power from sources both within and outside Delhi and supplies it to the DISCOMs and other licensees, viz. NDMC and MES. TRANSCO then charges Bulk Supply Tariff (BST) from the DISCOMs based on their individual paying capacity.

The Policy Directions envisaged identical retail tariffs for the DISCOMs till the end of 2006-07. To ensure this, an amount of Rs. 3450 crore was committed by the Government in the Policy Directions, as a loan to be disbursed to the Transmission Company. This amount was committed to bridge the gap between the revenue requirement of the TRANSCO and the bulk supply price that it may receive from the distribution licensees based on the above framework.

The study has analyzed that the TRANSCO has been constantly upgrading its infrastructure to ensure that the consumers of Delhi are supplied uninterrupted power without many breakdowns. Over the period from FY 2002-03 to FY 2006-07 TRANSCO has invested a sum of Rs.365.63 crore to strengthen and upgrade its network. The table below depicts the year wise investment made by TRANSCO from 2002 onwards.

Table 8.8: Capital Expenditure

	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Actual CAPEX (Rs. Cr.)	65.38	85.24	108.05	75.28	31.68

Source: DERC Data 2008

At present there are no overloaded feeders in the TRANSCO network.

The research borne out the fact from the secondary sources that Delhi is highly dependent on sources other than its own generating stations with as much as 80% of the total energy requirement met from external sources. The average cost for its own generating stations has ranged between Rs. 2.04 per unit for FY 2002-03 to Rs.2.50 per unit for FY 2006-07, Incidentally, it has been observed that despite the fact that the peak load in Delhi normally coincides with the peak in the northern grid, load shedding in some of the neighbouring States is more than that in Delhi. This is because TRANSCO has tied up with various sources including bilateral arrangements with other States. This has ensured an improved reliability of power supply in Delhi. Also various steps are being taken by the TRANSCO and DISCOMs to strengthen the transmission, sub-transmission and distribution system in view of the continuously rising demand.

The above analysis can be concluded with the key highlights and performance of distribution companies in Delhi

Among the three DISCOMs, BSES Rajdhani Power Limited (BRPL) serves an area of 670 sq. km and has the largest customer base amongst the DISCOMs. It also employs the largest work force amongst the three DISCOMs. BSES Yamuna Power Limited (BYPL) serves an area of 210 sq. km and has the smallest workforce. North Delhi Power Limited serves an area

of 510 sq. km and has the smallest consumer base. The following Table provides some general information about the three DISCOMs.

Table 8.9: Key highlights of Distribution Companies in Delhi (FY 2004-05/2005-06/2006-07)

Parameter	NDPL	BRPL	BYPL
Area (in Sq. Km)	510	670	210
Number of Consumers	724234	1017677	853261
No. of 66 & 33 kV feeders	99	150	105
No. of 11 kV feeders	548	767	520
Number of Distribution Transformers#	7519	5624	2988
Actual Energy Input in FY 2004-05 (MU)			
2004-05	5549	8405	5338
2005-06	5695	8648	5395
2006-07	5986	9122	5298
Fixed Assets (Rs. Crores)*	1609	1923	687
No. of employees	3642	3908	3325

Source: DERC ,2008

A comparison of the performance of the DISCOMs on technical parameters indicates that distribution losses are lowest in case of NDPL, while the failure of transformers is lowest in case of BRPL. Distribution Capex per unit sold and per consumer are higher for the BSES DISCOMs with BYPL showing the highest capital expenditure per unit sold and BRPL showing the highest capital expenditure per consumer.

Table 8.10: Comparison of Commercial parameters for Distribution Companies in Delhi for FY 2006-07

Parameter	NDPL	BRPL	BYPL
% AT&C losses			
2004-05	33.79	40.64	50.12
2005-06	26.51	35.53	43.89
2006-07	23.72	29.92	39.03
Units sold/consumer	5063	5295	3286
% of collection efficiency			
2004-05	100.20	92.58	94.89
2005-06	101	105	108
2006-07	104.9	108.8	105.6
Average Revenue Realization per unit sold (Rs/kWh)	4.15	4.07	4.04

Source: DERC Data 2008

AT&C losses of NDPL were 23.72% as on March 31, 2006 as against the level of 40.85% committed to be achieved by NDPL. NDPL has been able to reduce losses by 18% since the time of takeover in July 2002. Losses continue to be high in case of the BSES DISCOMs though they have also reduced losses consistently. As against the committed levels of 42.3%, BRPL has been able to reduce losses to 29.92% while BYPL has reduced losses to 39.03% against the committed level of 50.70%. The Collection Efficiency of three DISCOM is the highest. The reason for collection efficiency being more than 100% is that the collection of past arrears, i.e., arrears of the erstwhile DVB is taken into account in the computation of collection efficiency. The Average Revenue Realization is also the highest in case of NDPL.

When comparing the performance of the DISCOMs with regard to AT&C losses, it would be useful to highlight the performance of the DISCOMs with respect to the AT&C loss reduction targets committed by the DISCOMs at the time of privatization. As elaborated in earlier sections, the DISCOMs in Delhi were privatized based on the committed AT&C Loss reduction trajectory agreed between the GNCTD and the investors. The actual performance of the DISCOMs with respect to the commitments made towards reduction in AT&C loss levels is highlighted in the following Table 8.11.

Table 8.11: DISCOM-wise actual and committed AT&C Loss Levels

DISCOM	Opening Level (in %)	Jul 02-Mar 03 (in %)		2003-04 (in %)		2004-05 (in %)		2005-06 (in %)		2006-07 (in %)	
		(committed)	(actual)	(committed)	(actual)	(committed)	(actual)	(committed)	(actual)	(committed)	(actual)
South/West (BSES Rajdhani)	48.1	47.55	47.40	46.00	45.07	42.70	40.64	26.7	25.53	31.10	29.92
Central/East (BSES Yamuna)	57.2	56.45	61.89	54.70	54.29	50.70	50.12	45.05	43.89	39.95	39.03
North/North West (NDPL)	48.1	47.60	47.80	45.35	44.86	40.85	33.79	35.35	26.51	31.1	23.72

Source: DERC Data 2008

In FY 2006-07, all three DISCOMs achieved marginal over-achievement in reduction of losses with respect to the committed (bid) levels. As per the

provisions of the Policy Directions, the benefits of over-achievement of AT&C Loss reduction levels achieved by NDPL, BRPL and BYPL has been passed on to consumers while determining the Annual Revenue Requirement of the DISCOMs and the retail supply tariffs. The over-achievement in case of NDPL is quite high.

The analysis of the technical, commercial and operational parameters makes it evident that reforms in Delhi have led to a significant improvement in the above parameters and which has led to improvement in quality of service, collection efficiency and loss levels have been significantly reduced which is effective step towards success.

Objective 2b. Measuring performance of Power distribution companies in Delhi against the Quality of Service performance parameters during 2000-2007 from the consumer point of view.

The performance of power distribution companies against the Quality of Service from the consumer point of view has been analyzed as from chapter 1, table 1.1 the following observations were made. A total of 1002 consumers were surveyed across all 3 DISCOMs. Primary data has been gathered based on questionnaire which includes various Quality of Service parameters which is provided at the end of the section (Annexure 1).The quantitative technique is used to asses the satisfaction level on different parameters.

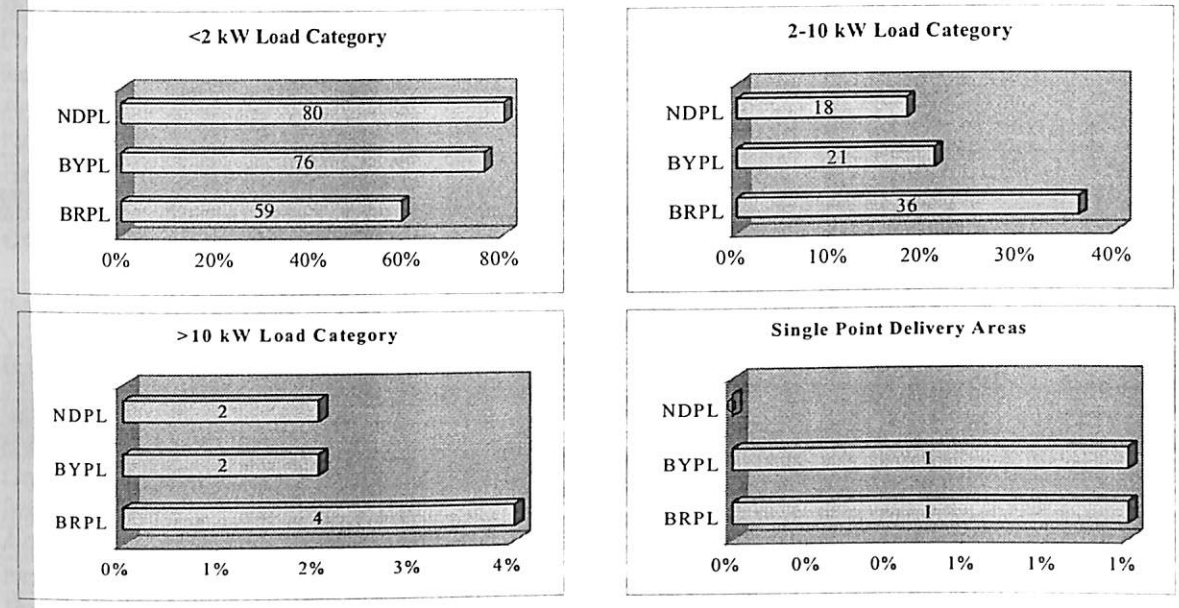
The total sample size of 1002 consumers was proportionately distributed across the 3 DISCOMs on the basis of the total number of consumers metered in each of the DISCOM given in the which was further distributed across the 4 different types of load categories (i.e. less than 2 KV, between 2-10 KV, more than 10 KV, and Single Point Delivery) in proportion to the total number of consumers in the particular load category. as per the research methodology explained in Chapter 1. The distribution of consumers in DISCOMs as per our survey is as shown in Table 8.12a.

Table 8.12a: Distribution of Consumers in DISCOMs

Load Category	Distribution Company						Total	
	BRPL		BYPL		NDPL		N	%
	N	%	N	%	N	%		
<2 KW	242	59	231	76	249	80	722	72
2-10 KW	140	36	63	21	45	18	248	25
>10 KW	16	4	3	2	6	2	25	2
Single Point Delivery Areas	4	1	3	1	0	-	7	<1
Total	**402**	**100**	**300**	**100**	**300**	**100**	**1002**	**100**

The graphical depiction of the distribution of consumers in the 3 DISCOMs and load categories within is given in Exhibit No. 8.6.

Exhibit No. 8.6: Distribution of Consumers in Load Categories of DISCOMs



The survey analyzed as in Table8.12b reflects that Load Shedding emerges as the major concern among the consumers across the DISCOMs and metering emerges as second most important concern. The third important concern raised by the consumers pertains to Billing.

Table 8.12b: Power Related Problems Mentioned by Consumers by Load Category

<2Kw Load Category						
CONCERN	**BRPL**		**BYPL**		**NDPL**	
	NO	**%**	**NO**	**%**	**NO**	**%**
Failure of power supply	9	3	20	9	9	4
Voltage fluctuations	38	15	34	14	23	9
Load shedding/scheduled/unscheduled outages	162	65	148	64	185	75
Metering Problems	51	20	58	25	79	32
Billing Problems	39	16	46	20	45	18
Delay in giving new connection/disconnection/ load/reduction	3	0	7	0	6	0
Any other problems	5	0	1	0	3	0
No Problem	57	23	47	20	44	18
Base (Number of Respondents)	**249**		**233**		**245**	
2- 10 Kw Load Category						
CONCERN	**BRPL**		**BYPL**		**NDPL**	
	NO	**%**	**NO**	**%**	**NO**	**%**
Failure of power supply	9	6	1	3	2	4
Voltage fluctuations	29	19	8	12	5	10
Load shedding/scheduled /unscheduled outages	105	69	37	56	35	63
Metering Problems	31	20	18	27	16	30
Billing Problems	25	16	15	23	12	23
Delay in giving new connection/disconnection/ load/reduction	2	0	2	0	0	0
Any other problems	0	0	0	0	0	0
No Problem	32	21	15	24	159	29
Base (Number of Respondents)	**152**		**65**		**54**	
>10 Kw Load Category						
CONCERN	**BRPL**		**BYPL**		**NDPL**	
	NO	**%**	**NO**	**%**	**N0**	**%**
Failure of power supply	9	52	1	17	0	0
Voltage fluctuations	3	18	1	17	3	50
Load shedding/scheduled /unscheduled outages	8	47	1	17	5	83
Metering Problems	3	17	1	17	2	33
Billing Problems	2	11	1	17	5	83
Delay in giving new connection/disconnection/ load/reduction	0	0	0	0	0	0
Any other problems	0	0	0	0	0	0
No Problem	7	16	2	34	1	17
Base (Number of Respondents)	**17**		**6**		**6**	
SPD Areas						
CONCERN	**BRPL**		**BYPL**		**NDPL**	
	NO	**%**	**NO**	**%**	**NO**	**%**
Failure of power supply	1	25	1	33	-	-
Voltage fluctuations	1	25	2	66	-	-
Load shedding/scheduled /unscheduled outages	3	75	2	66	1	1
Metering Problems	2	50	1	33	1	1
Billing Problems	1	25	1	33	-	-
Delay in giving new connection/disconnection/ load/reduction	1	50		0	-	-
Any other problems	-	-		0	-	-
No Problem	0	0	1	33	-	-
Base (Number of Respondents)	**5**		**3**		0	
Total exceeds N (100) due to multiple response						

To conclude, the power related problems mentioned by consumers by load category are as follows:

(a) Load Shedding

The Load shedding/ scheduled/ unscheduled outage is the major service parameter that concerns the consumers across the load categories of the 3 DISCOM. At a more specific level, with respect to 'less than 2 Kw category, majority of the respondents (65% in BRPL, 64% in BYPL and 75% in NDPL) expressed their concern regarding load shedding as mentioned in Table 8.12b.

The respondents in the 2-10 Kw category across the 3 DISCOM similarly expressed major concern for load shedding (69% in BRPL, 56% in BYPL and 63% in NDPL). In the above 10 Kw load category also, the major concern is 'load shedding' (Table 8.12b). About half of the BRPL consumers (47%) and three fourth of NDPL consumers (78%) are concerned about load shedding in the SPD areas too.

This data reflects that across the DISCOMs, two third (66%) of the respondents from all the load categories reported load shedding as the major concern.

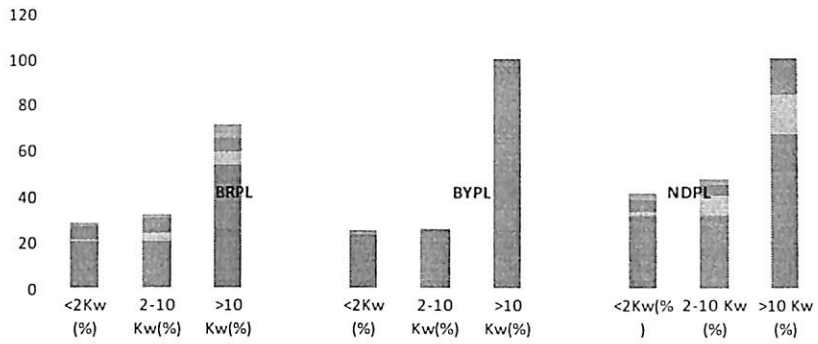
(b) Metering

Metering emerged as second major concern across all load categories of 3 DISCOMs in NCT Delhi. Further probing was done to understand the specific problems pertaining to metering indicates that 'fast running of meter' is the most significant concern with respect to 'metering' for consumers of < 2 Kw category. Across the load categories, one fourth of the BYPL consumers expressed major concern for metering.

Table 8.13: Specific Concerns of Consumers Relating to Metering

<2Kw Load Category						
CONCERN	**BRPL**		**BYPL**		**NDPL**	
	No	**%**	**No**	**%**	**No**	**%**
Meter runs too fast	46	18	47	20	71	29
No faith in meter reading	6	2	8	3	4	2
Self generated readings (without seeing meter)	2	6	-		6	0
The meter reading is high & not per our actual consumption	15	6	-		13	5
Others	3	0	5	0	8	0
Base (Number of Respondents)	**249**		**232**		**245**	
2-10 Kw Load Category						
CONCERN	**BRPL**		**BYPL**		**NDPL**	
	No	**%**	**No**	**%**	**No**	**%**
Meter runs too fast	28	18	15	23	16	29
No faith in meter reading	4	3	2	3	1	2
Self generated readings (without seeing meter)	7	0	-	-	5	1
The meter reading is high & not per our actual consumption	10	7	-	-	3	6
Others	3	0	-	-	1	0
Base (Number of Respondents)	**154**		**65**		**55**	
>10 Kw Load Category						
CONCERN	**BRPL**		**BYPL**		**NDPL**	
	No	**%**	**No**	**%**	**No**	**%**
Meter runs too fast	3	18	1	21	3	43
No faith in meter reading	6	4	6	9	1	2
Self generated readings (without seeing meter)	1	1	-	-	1	2
The meter reading is high & not per our actual consumption	1	9	-	-	1	27
Others	1	1	-	-	-	-
Base (Number of Respondents)	**17**		**7**		**6**	
Total exceeds N (100) due to multiple response.						

Exhibit No. 8.7: Specific Concerns of Consumers Relating to Metering



	<2Kw (%)	2-10 Kw(%)	>10 Kw(%)	<2Kw (%)	2-10 Kw(%)	>10 Kw(%)	<2Kw(%)	2-10 Kw (%)	>10 Kw (%)
Others	1	2	6	2	0	0	3	2	0
The meter reading is high & not per our actual consumption	6	6	6	0	0	0	5	5	16
Self generated readings (without seeing meter)	1	4	6	0	0	0	2	9	17
No faith in meter reading	2	2	35	3	3	86	2	2	17
Meter runs too fast	18	18	18	20	23	14	29	29	50

- To analyse the specific concerns related to metering the meter running too fast 'Meter runs too fast' is also the specific concern in metering for consumers of 2-10 Kw load category (18% in BRPL, 23% in BYPL and 29% in NDPL). With respect to >10 Kw load category, more than one fifth of the consumers in BRPL and BYPL reported that meter runs too fast. In NDPL also, 'meter runs too fast' is the specific concern expressed by more than two fifth of the consumers.

(c) Billing

With respect to key service parameters, besides load shedding and metering, billing is the third major concern for consumers across all load categories and the 3 DISCOMs.

In all 6 key aspects related to billing were assessed across all load categories of the 3 DISCOMs, viz.

- Meters are read by the DISCOM meter reader
- Bills are always received on actual reading basis
- Bills are always received on time
- Bills generated always reflect the meter reading and bill amount
- Bills are always delivered by DISCOMs
- Satisfaction level with billing

The consumers are largely of the opinion that meters are *regularly* read by the DISCOM meter reader. The consumers response in case of less than 2Kw load category is (75% in BRPL, 58% in BYPL and 84% in NDPL) .

mong the consumers of 2-10 Kw load category, the opinion that meters are ead regularly by the DISCOM meter reader was perceived by 65% in BRPL, 5% in BYPL and 79% in NDPL consumers. For the consumers of more than 0 Kw load category, more than two third in each of the 3 DISCOMs are of the pinion that meters are regularly read by the DISCOM meter reader. Bills generated by the DISCOM always reflect the meter reading and bill amount.

Satisfaction Level with Billing

Proportion of consumers who are highly satisfied, satisfied or reasonably satisfied with billing varied from 20% in case of NDPL to 30% in case of BRPL in <2kw load category. In case of 2-10kw category, the proportion varied between 26% and 29%. On the other hand, the proportion varied from 14% among NDPL/BYPL consumers to 35% among BRPL consumers for >10kw category.

Table 8.14: Consumer Satisfaction with Billing

Satisfaction Level with Billing						
<2 kw load category						
Frequency	**BRPL**		**BYPL**		**NDPL**	
	N	**%**	**N**	**%**	**N**	**%**
Highly satisfied	2	1	5	1	1	2
Satisfied	5	13	5	12	6	14
Reasonably satisfied	6	16	8	19	1	4
Dissatisfied	27	70	31	68	35	80
Base (Respondents that have billing problems)	39	100	46	100	44	100
2 –10 kw load category						
Frequency	**BRPL**		**BYPL**		**NDPL**	
	N	**%**	**N**	**%**	**N**	**%**
Highly satisfied	1	0	3	2	3	2
Satisfied	2	9	2	13	2	19
Reasonably satisfied	4	16	2	13	8	6
Dissatisfied	18	74	10	71	9	72
Base (Respondents that have billing problems)	25	100	14	100	12	100
>10 kw load category						
Highly satisfied	1	5	-	-	1	14
Satisfied	2	10	1	7	-	-
Reasonably satisfied	4	20	1	7	-	-
Dissatisfied	1	65	1	86	6	86
Base (Respondents that have billing problems)	20	100	14	100	7	100

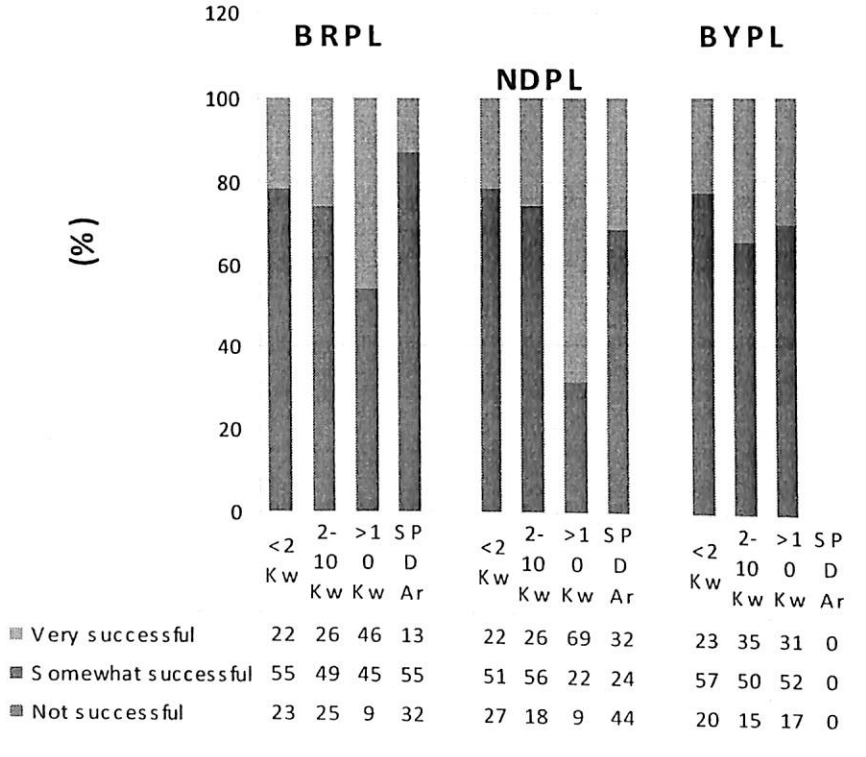
SUCCESS OF PRIVATE DISCOMs

The survey points out that the consumers view DISCOMs in terms of success and the results are presented in Exhibit No. 8.8. About three fourth of the consumers of less than 2 Kw load category rated the services of DISCOMs as 'Successful or Very successful' (77% in BRPL, 73% in BYPL and 80% in NDPL). Similarly in 2-10 Kw load category, three fourth to four fifth of the consumers rated the services successful (76% in BRPL, 82% in BYPL and 85% in NDPL).

The responses in more than 10 Kw category are highly optimistic, as 91% consumers in BRPL, 91% in BYPL and 82% in NDPL rated the services provided by DISCOMs as successful or very successful. In SPD category the responses were mix as 68% in BRPL and 56% in BYPL rated the services of DISCOM as successful.

Altogether, the concerns raised by the consumers are fast running meters, over billing, load shedding, high tariff rates of power, voltage fluctuation, meter problem, theft of power, transformer runs out of order and improper delivery of electricity bills.

Exhibit No. 8.8: Success of private DISCOM as perceived by consumer



Welfare Associations on issues related to billing and metering have raised a lot of objections like:

- Inflated billing
- Wrong reading being taken
- Computation mistakes in bills
- Late delivery of bills
- Faster meters Metering and Billing Problems: Since privatisation, a lot of hue and cry has been raised by the Consumers on issues relating with metering and billing of power. Various consumers including Resident
- Installation of meters which are not approved by agencies like the ISI.

PERFORMANCE RATING AND OVERALL SATISFACTION

The respondents rated the DISCOMs on a 10 point scale in terms of performance. The Table 8.15 gives the analysis of the data. The mean satisfaction score range from 5.10 for BYPL to 5.67 for NDPL.

Table 8.15: Performance Rating of Discom

Rating ↓	DISCOM					
	BRPL		BYPL		NDPL	
	No.	Wt. Score	No.	Wt. Score	No.	Wt. Score
1	31	31	38	38	26	26
2	30	60	30	60	15	30
3	23	69	12	36	11	33
4	38	152	23	92	22	88
5	92	460	57	285	67	335
6	80	480	53	318	45	270
7	49	343	35	245	39	273
8	40	320	31	248	43	344
9	24	216	20	180	28	252
10	15	150	4	40	7	70
Mean Score	**5.40**		**5.10**		**5.67**	

Exhibit No. 8.9: Overall Satisfaction

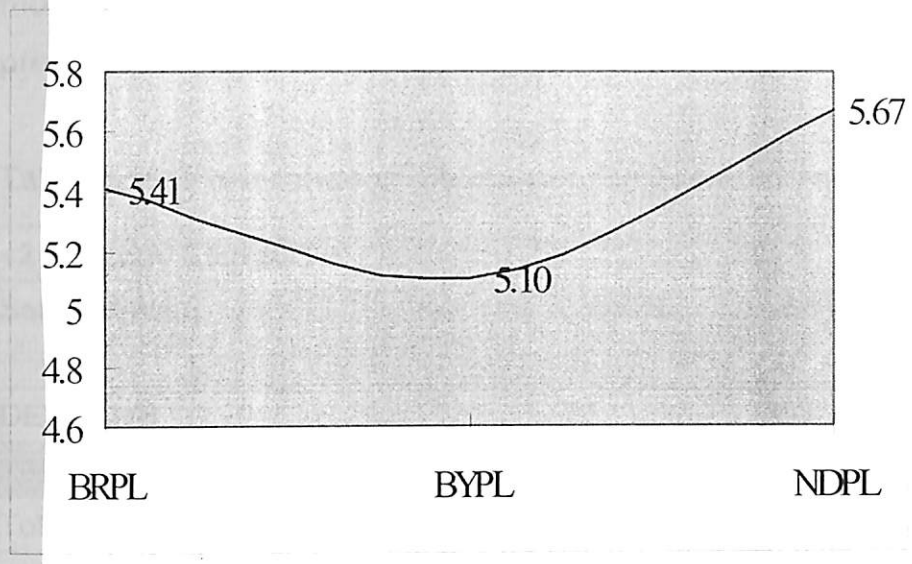
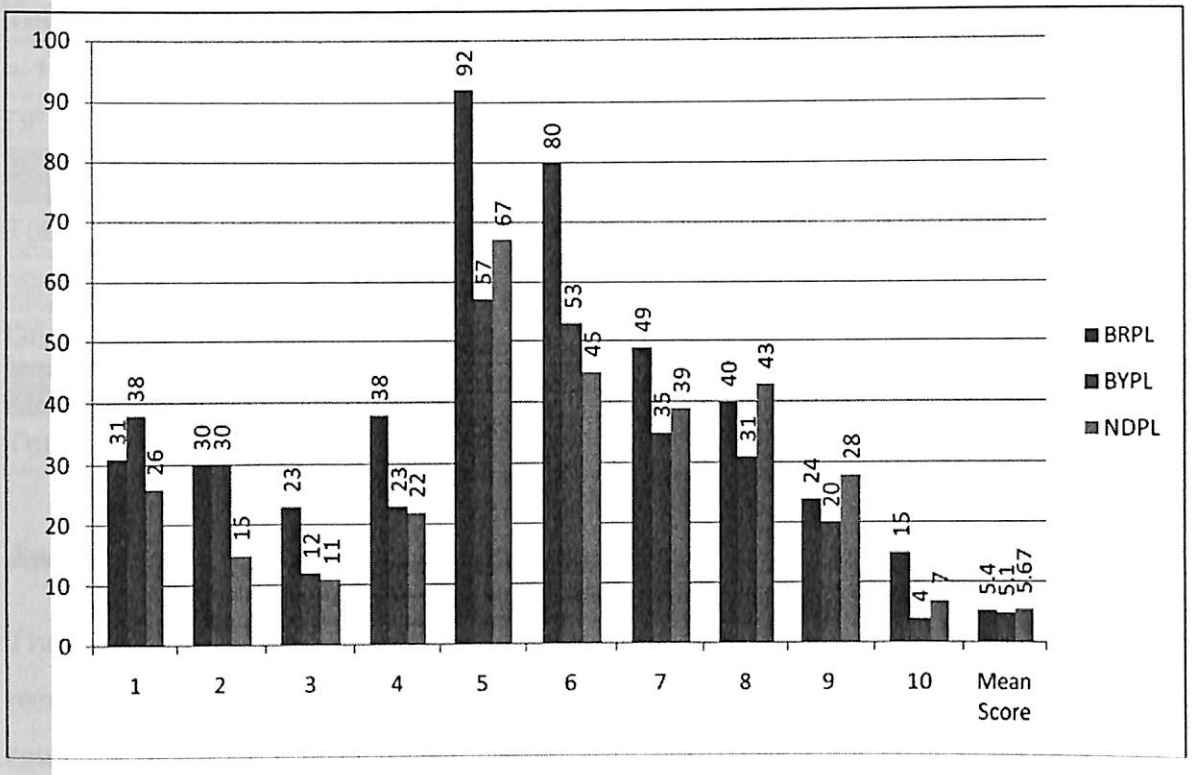


Exhibit No. 8.10: Performance Rating of DISCOM



Preference of Service provider DESU/DVB VS. PVT. DISCOMS

Analyzing the preference to DESU /DEB vs pvt DISCOMs. The analysis presented in Table 8.16 indicates higher preference for private DISCOM. More than half of the consumers (61% in BRPL, 55% in BYPL, 65% in NDPL) in less than 2 Kw load category prefer private DISCOM. The preference for

private DISCOMs is highest in case of more than 10 Kw category, where more than four fifth of the consumers (BRPL-84%, BYPL-90%, NDPL-81%) preferred Private DISCOMs.

Table 8.16: Preference of Consumer for Service Provider

<2 Kw Load Category						
Satisfied With	**BRPL**		**BYPL**		**NDPL**	
	N	**%**	**N**	**%**	**N**	**%**
DESU/DVB	95	3	103	45	85	35
Private DISCOM	152	61	128	55	159	65
Total	249	100	232	100	245	100
2-10 kw Load Category						
DESU/DVB	61	40	23	36	13	24
Private DISCOM	93	60	4	64	41	76
Total	154	100	64	100	55	100
> 10 Kw Load Category						
DESU/DVB	2	16	7	10	1	19
Private DISCOM	14	84	6	90	5	81
Total	17	100	6	100	6	100
DESU/DVB	1	30	1	32		
Private DISCOM		70	2	68		
Total	4	100	3	100		

Awareness about DERC and its Activities

The extent of awareness about DERC among consumers are analysed as the results are presented in Table 8.17. In 2 Kw category less than one tenth each of the BRPL and NDPL consumers reported awareness about DERC, while more than one tenth reported so in case of BYPL(15%) The extent of awareness of DERC increased with increase in load category for BRPL and BYPL.

Table 8.17: Awareness of DERC

<2kw Load Category						
Type of Response	BRPL		BYPL		NDPL	
	N	%	N	%	N	%
Yes	22	9	34	15	15	6
No	226	91	198	85	230	94
Total	249	100	232	100	245	100
2-10 kw Load Category						
Yes	23	15	8	13	10	19
No	130	85	56	88	44	81
Total	154	100	64	100	55	100
>10 kw Load Category						
Yes	4	25	-	-	1	21
No	12	75	6	100	5	79
Total	17	100	6	100	6	100
SPD Areas						
Yes	2	4	-	-		
No	4	96	3	100		
Total	4	100	3	100		

The salient feature of the study analyzed above shows that in a global market place burgeoning with newly created regulators that oversee increasingly commercialized energy there is a marked need for improved consumer service.

- The challenge faced by regulatory bodies is how to provide and measure the improved Quality of Service to the consumer. In the process, this research attempts to examine and evaluate the outcome of the reforms process in power sector industry by putting it in the backdrop of power distribution reforms at the national level.

- As an outcome of that exercise, this research validates the power distribution reform process undertaken in the light of the profile of the consumers who responded to the survey, followed by an assessment of their satisfaction level with respect to key 'service' parameters, redressed mechanism that exists and the extent to which the same is used for addressing 'utility' concerns. The consumer is facing the problems related

to Load Shedding, Concern of Metering and billing although the DISCOMs has shown better performance with respect to the efficiency parameters i.e. reduction in T&D losses, collection efficiency etc as analyzed in objective 2.A.

- The consumers were not much aware about the grievances handling mechanism which have been put in place in form of Discom-wise Consumer Grievances Redressal Forums (CGRFs) and the Appellate Institution of the Electricity Ombudsman. The awareness about DERC among consumers was also not much.
- However, the Survey found that the consumers preferred the services rendered by the Discoms over those of the erstwhile DESU/DVB. There is an urgent need to ensure sustainable improvement in the quality of service. More efforts are required to improve the overall satisfaction levels of the consumers with respect to the utility at a generic level and the respective DISCOM and redressal mechanism(s) at a specific level.

- Restructuring is a necessary but not a sufficient condition for turnaround of the power sector. It is important to note that restructuring is only the beginning and not the end of the process. It must be accompanied by continuous complementary efforts to enhance efficiency in the sector and improve the Quality of Service to consumers.

Objective 4: To provide suggestions for improving the quality of service in the power distribution from the consumer point of view

Based on the findings of the study as outlined in Chapter 7 & Section 8.3, this chapter presents a view of road ahead. Salient points of findings are presented below and also the relevant suggestions that could possibly be looked into are also being put forward.

Following are some the key concerns that need immediate attention.

In the 3 DISCOMs and across the load categories, load shedding, metering and billing emerge as the major concerns of the consumers.

Based on the key conclusions discussed above, the following needs to be possibly looked into:

Concern for Load Shedding

Based on the priority of concerns given by the consumers, it is quite evident that load shedding needs the immediate attention of the DERC and utility service providers. Prior information on load shedding and reduction in the duration of cuts could possibly be looked into.

Concern for Metering

As the consumers find metering to be the second major concern, the service providers could possibly look into all viable options within the provision of their framework to improve the issue of 'metering' that would in turn enhance the satisfaction level of the consumers in this context.

Awareness Generation

In view of the low levels of awareness priority to awareness generation of 'redressal mechanisms' needs to be given so that consumers are more pro regarding DERC and CGRF among the consumers. It is essential to give adequate advice in addressing utility related concerns. This would play a substantial role in improving the overall satisfaction levels of the consumers with respect to the utility at a generic level and the respective DISCOM and redressal mechanism(s) at a specific level.

The key findings of the Study are:

- Restructuring is a necessary but not a sufficient condition for turnaround of the power sector.
- Strong and sustained political support during all phases of restructuring is the key for success. Taking the employees into confidence and enlisting their willing support and strengthening the institution of Electricity Regulators are critical factors for success and sustainability of power sector reforms.
- Most of the GENCOs, TRANSCOs and some of the DISCOMs have now become financially viable. Consequently, they are able to attract additional investments and better technological and managerial interventions.

- It has been noticed that most of the restructured Utilities are beaming positive trends in respect of key parameters wherever reasonable autonomy has been provided to them. Restructuring has brought in the required accountability in the power sector triggering improved performance. Such positive correlation needs to be further reinforced through well designed systems and adoption of best practices on a continuing basis.

Restructuring should not be misconstrued as privatization. It requires demystification, aggressive education and creation of a strong constituency to preserve, promote and develop the essence of restructuring. For ensuring that consumers get high quality services from utilities over a range of parameters and for bringing in operational efficiency, the regulations should provide for standards of performance specifying therein the type of supply failure.

Road Ahead

Discoms to self regulate in maintenance of standards automatic compensation to be dispensed for violation of standards, empowerment of CGRFs/Ombudsmen for their effective functioning, massive consumer awareness programmes through Print/Audio Visual media has to be done. Engagement of consumer counsel in Tariff/PPA/License Proceedings, Follow up on training of field staffs of Discoms & consumer organizations ,frequent consumer interface & networking with consumer right groups ,case tracking through interactive website are some major steps to be taken by the regulator and distribution licensees.

Making the distribution system industry efficient is a key to the success of power sector reforms. Therefore, the Regulatory Commission needs to strike the right balance between the requirement of commercial viability of distribution licensees and consumers' interest. There is an urgent need to ensure sustainable improvement in the quality of service.

Frequent consumer interface & networking with consumer rights groups needed. Case tracking through interactive website suggested. Licensees do not accept complaints easily so CGRF should directly intervene in such cases. DERC should employ consultants to examine whether licensees are

operating within the prescribed standards. Rule books should be provided with new electricity connections.

Objective 5: To study the possibilities of replication in case of other states

The structural reforms have been initiated in the power sector in almost all the States in the country. Chapter 4 and 6 examine the spectrum of international and national Power sector reform process and its experiences with reference to the distribution reforms in the context of Delhi. The Delhi reform process had the preceding experience of the reform process undertaken in the States of Orissa and Andhra Pradesh. The following Exhibit No.8.11 captures the various issues that were faced during the process in Orissa, Andhra Pradesh and steps taken to ensure that the same mistakes were not committed in case of Delhi.

Exhibit No. 8.11: Comparative analysis of the Power Distribution reforms in case of Orissa, Delhi and Andhra Pradesh

Issues	Orissa Experience	Steps taken in Delhi	Steps taken in AP
Government commitment	Government distanced itself as soon as the privatization took place	➢ Government remained committed to the success of reforms ➢ Clear cut Policy Directions for 5 years Committed support of Rs.3450 Crore	➢ Support of the State Government ➢ The "common Minimum National Action for Power "was released . ➢ Creation of working groups in the reform cell
Prevalent Loss levels	➢ Base line data mismatch ➢ Difficulty in segregating losses	➢ Concept of AT&C losses to: 1. Reduce scope for baseline data errors 2. Provide a more realistic figure for losses. 3. Provide comfort to the investors since it was approved by the Commission.	➢ Prescribing standards of performance to the licenses. ➢ Reduction in the subsidy component on a/c of efficiency gains ➢ Reduction in T &D losses from 38% to 21.4%.
Funding support	No support from commercial lenders	➢ Assurance sought from the Government for funds under the APDRP, PFC sanctioned schemes, etc. ➢ Bidding structure assures guaranteed returns which facilitates commercial loan availability.	➢ Regular annual tariff adjustments allowed by the commission to bridge the gap between the expenditure and revenue.
Government Financial Support	None	➢ Government committed Rs.3450 Crore as transition support to avoid tariff shock to the consumers. This support was provided to TRANSCO to meet the gap between the BST and the actual power purchase cost.	➢ Confirming financial Autonomy on the DISCOMs ➢ Good support from APDRP for network strengthening

Issues	Orissa Experience	Steps taken in Delhi	Steps taken in AP
Pre-privatization liabilities		➢ Government created a relatively clean balance sheet by retaining non-serviceable liabilities in the Holding Company ➢ Only serviceable liabilities transferred to DISCOMs	➢ Carrying out tariff adjustment every year ➢ Tariff revisions were not allowed earlier for political reason
Receivables	➢ Unrealistically high ➢ Bad debts not allowed by Regulator	➢ Limited to last month's receivables ➢ Past receivables to the account of Holding Company, the DISCOMs were authorized to collect the past receivables (20% incentive on amount collected)	➢ Regular annual tariff adjustments
Regulatory Involvement	No prior involvement	➢ Full involvement from beginning ➢ Indicated amenability to reform process ➢ Policy Directives accepted in BST Order ➢ Recognition of DISCOM involvement in BST Order	➢ Creation of separate Reform cell ➢ Wide publicity to reforms ➢ Recognizing the employees as major stakeholders in the reform process ➢ Involvement of media and consumer associations.
Audited Accounts	➢ Audited Accounts not available ➢ Led to Post Takeover Problems with the Statutory Bodies	➢ Audited Accounts not available, however, clean Balance Sheets assured to DISCOMs ➢ Business valuation approach mitigates risk of asset valuation ➢ Stores & Spares, Loans to Personnel, etc. to be based on actual Audit	➢ The first transfer scheme vested assets, liabilities personnel etc with the APGENCO and APTRANSCO was implemented. ➢ The second transfer scheme, vesting the distribution assets, liabilities, personnel, etc. with the four DISCOMs.
Asset Valuation	➢ Assets revalued at higher levels prior to bidding process	➢ To ensure a sustainable level of liabilities, assets valued through business valuation based on revenue earning potential	➢ Financial restructuring plan was comprised of rationalization of tariffs, restructuring of the balance sheets through indemnification, write-off and provisioning for doubtful or non-performing assets, settlement of unfunded liabilities, debts and commercial liabilities.

Lessons from Delhi and other states Reform Experience

Results of more than a decade of efforts in reforming power sector In India have been mixed. The experience has been much more painful than anyone had expected during the initial phase. While there has been reasonable success in creating legal framework, setting up of regulatory bodies, enforcing transparency in tariff decision making, failures in distribution reforms, attracting private investment, controlling huge losses, establishing competitive market, commercialization stare at the face of policy makers, regulators and champions of reforms. It is easier to blame slow pace of reforms in other vital areas such as reforms in primary energy market, fiscal reforms at State levels for failure in power reforms, it is necessary to look inwards and analyze the challenges that are yet to be effectively met. In the light of the experiences of three states studied above in case of power distribution reforms the following lessons are learnt which can be considered as guiding principles for the other states:

- The change in management culture and the commercial orientation has led to assist in reducing losses and the benefits gained due to higher efficiencies would help reduces the consumer tariffs in the long run and improve the quality of service, as happened in several countries.
- There are a wide variety of business opportunities available for private sector.
- The government also needs to prove its commitment to reforms in terms of political will and support for rationalization of subsidies and action against theft, with legal framework.
- Finally, the most significant factor affecting investor sentiment is the regulatory framework.

These pioneering efforts have offered valuable lessons for other states who are embarking on reforms. The Government of Delhi deserves all the credit for improving on the experiences from Orissa and Andhra Pradesh for showing the way for other reforming states.