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Abbreviations

A&G	Administration and General
ABT	Availability Based Tariff
AC	Average Cost
ADB	Asian Development Bank
AEGCL	Assam Electricity Grid Corporation Limited
AERC	Assam Electricity Regulatory Commission
APCPDCL	Central Power Distribution Company of Andhra Pradesh Limited
APDRP	Accelerated Power Development and Reform Programme
APEPDCL	Eastern Power Distribution Company of Andhra Pradesh Limited
APER Act 1998	Andhra Pradesh Electricity Reform Act 1998
APERC	Andhra Pradesh Electricity Regulatory Commission
APGCL	Assam Power Generation Corporation Limited
APGENCO	Andhra Pradesh Power Generating Company
APGPCL	Andhra Pradesh Gas Power Corporation Limited
APNPDCL	Northern Power Distribution Company of Andhra Pradesh Limited
APSEB	Andhra Pradesh State Electricity Board
APSPDCL	Southern Power Distribution Company of Andhra Pradesh Limited
APTRANSCO	Transmission Company of Andhra Pradesh Limited
AR	Average Revenue
ARR	Aggregate Revenue Requirement
ASEB	Assam State Electricity Board
AT&C	Aggregate Transmission & Commercial
ATPS Chachai	Amarkantak Thermal Power Station, Chachai
BDPP	Brahamapuram Diesel Power Plant
BEST	Brihan Mumbai Electric Supply & Transport
BMR	Bombai Metropolitan Region
BPL	Below Poverty Line
BRPL	BSES Rajdhani Power Ltd.
BSEB	Bihar State Electricity Board

BSES	Bombay Suburban Electric Supply
BST	Bulk Supply Transmission
BTPS	Badarpur Thermal Power Corporation
BYPL	BSES Yamuna Power Ltd.
C.I	Convergence Index
CA	Chartered Accountant
CAC	Commission Advisory Committee
CAEDCL	Central Assam Electricity Distribution Company Limited
CAG	Comptroller and Auditor General
CAGR	Compound Annual Growth Rate
CCL	Central Coalfields Limited
C-DAC	Centre for Development of Advanced Computing
CEA	Central Electricity Authority
CEO	Chief Executive Officer
CERC	Central Electricity Regulatory Commission
CESC	Calcutta Electric Supply Company
CGHS	Co-operative Group Housing Societies
CGRF	Consumer Grievance and Redressal Form
CGRO	Circle Grievance Redressal Officer
CGS	Central Generating Station
CI	Convergence Index
CISF	Central Industrial Security Force
CoS	Cost of Service
CPSU	Central Power Sector Undertakings
Cr	Crore
CRISIL	Credit Rating Information Services of India Limited
CSEB	Chattisgarh State Electricity Board
CSGS	Central Sector Generating Stations
CWIP	Capital Works in Progress
DA	Dearness Allowance
DFID	Department for International Development
DISCOMs	Distribution Companies

DMRC	Delhi Metro Rail Corporation
DPC	Dabhol Power Company
DPL	Durgapur Projects Limited
DPR	Detailed Project Report
DPSCCL	Dishergarh Power Supply Company Limited
DSM	Demand Side Management
DTL	Delhi Transco Limited
DTR	Distribution Transformer
DVB	Delhi Vidyut Board
DVC	Damodar Valley Corporation
EA 2003	Electricity Act 2003
EC	Employee Cost
EHV	Extra High Voltage
ERCs	Electricity Regulatory Commissions
ERLDC	Eastern Regional Load Dispatch Center
FAC	Fully Allocated Costs
FACT	Fully Allocated Cost Tariffs
FAR	Fixed Asset Register
FCA	Fuel Cost Adjustment
FCC	Financial Completion Certificate
FOCA	Fuel and Other Cost Adjustment
FOR	Forum of Regulators
FY	Financial Year
GENCO	Generation Companies
GFA	Gross Fixed Asset
Gillanders	Gillanders Arbuthnot and Company Limited
GIS	Geographic Information System
GoA	Government of Assam
GoAP	Government of Andhra Pradesh
GoI	Government of India
GoM	Government of Maharashtra
GoMP	Government of Madhya Pradesh

GoNCTD	Government of National Capital Territory of Delhi
Goodricke	Goodricke Group Limited
GoWB	Government of West Bengal
GPF	General Provident Fund
GT	Gas Turbine
HDFC	Housing Development Finance Corporation
HEP	Hydro Electric Power
HINDALCO	Hindustan Aluminum Company
HoldCo	Holding Company
HP	Horse Power
HQ	Head Quarter
HT	High Tension
HV	High Voltage
HVDS	High Voltage Distribution System
Indal	Indian Aluminium Company
IP	Indraprastha Power
IPPs	Independent Power Producers
IT	Information Technology
ITA	Indian Tea Association
JSEB	Jharkhand State Electricity Board
JSERC	The Jharkhand State Electricity Regulatory Commission
KDPP	Kozhikode Diesel Power Plant
KGPS	Kawas Gas Power Station
KSEB	Kerala State Electricity Board
KSERC	Kerala State Electricity Commission
KTPS	Kolaghat Thermal Power Station
KW	Kilowatt
LAEDCL	Lower Assam Electricity Distribution Company Limited
LDC	Load Dispatch Center
LIC	Life Insurance Corporation
LIP	Large Industrial Power
LT	Low Tension

LTA	Leave Travel Allowance
LTIS	Low Tension Industrial Services
LTPS	Lakwa Thermal Power Station
LV	Low Voltage
MAHADISCOM	Maharashtra State Electricity Distribution Company
MBC	Metering, Billing and Collection
MBM	Multi-Buyer Model
MCD	Municipal Corporation of Delhi
MEDA	Maharashtra Energy Development Agency
MERC	Maharashtra Electricity Regulatory Commission
MeSEB	Meghalaya State Electricity Board
MIS	Management Information System
MLHT	Mixed Load High Tension
MNP	Minimum Need Program
MoP	Ministry of Power
MoU	Memorandum of Understanding
MP	Madhya Pradesh
MPECS	Mula Pravara Electric Co-operative Society
MPERC	Madhya Pradesh Electricity Regulatory Commission
MPMKVVCL	M.P. Madhya Kshetra Vidyut Vitaran Company Ltd.
MPP	Malavalli Power Plant
MPPGCL	M.P. Power Generating Company Ltd.
MPPKVVCL	M.P. Poorv Kshetra Vidyut Vitaran Company Ltd.
MPPKVVCL	M.P. Paschim Kshetra Vidyut Vitaran Company Ltd.
MPPTCL	M.P. Power Transmission Company Ltd.
MPSEB	Madhya Pradesh State Electricity Board
MRI	Meter Reading Instrument
MSEB	Maharashtra State Electricity Board
MSEDCL	Maharashtra State Electricity Distribution Company Limited
MSETCL	Maharashtra State Electricity Transmission Company Limited
MSPGCL	Maharashtra State Power Generation Company Limited
MTB	Monthly Trial Balance

MU	Million Units
MW	Mega Watt
MYT	Multi Year Tariff
NABARD	National Bank for Agriculture and Rural Development
NDPL	North Delhi Power Ltd.
NEDCAP	Non-Conventional Energy Development Corporation of Andhra Pradesh
NEEPCO	North Eastern Electric Power Company
NFA	Net Fixed Asset
NHPC	National Hydro Power Corporation
NJPC	Naptha Jhakri Power Corporation
NLC	Neyveli Lignite Corporation
NPC	Nuclear Power Corporation
NRLDC	Northeren Region Load Dispatch Centre
NTPC	National Thermal Power Corporation
NTPS	Namrup Thermal Power Station
NVVN	NTPC Vidyut Vyapar Nigam Limited
O&M	Operation & Maintenance
OA	Open Access
OCFA	Original Cost of Fixed Assets
OECE	Overseas Economic Cooperation Fund
OTEC	Ocean Trend Energy Conversion
PCC	Physical Completion Certificate
PF	Power Factor
PFC	Power Finance Corporation
PGCIL	Power Grid Corporation of India Limited
PGRO	Principle Grievance Redressal Officer
PIUs	Power Intensive Industrial Units
PLCC System	Power Line Carrier Communications System
PLF	Plant Load Factor
PLR	Prime Lending Rate
PMGY	Pradhan Mantri Gramodaya Yojana

PMR	Pune Metropolitan Region
PPAs	Power Purchase Agreements
PPC	Power Purchased Cost
PPCL	Pragati Power Corporation Limited
PPFCA	Power Purchase and Fuel Cost Adjustments
PPS	Pragati Power Station
PTC	Power Trading Corporation
PTCUL	Power Transmission Corporation of Uttaranchal Limited
PTPS	Patratu Thermal Power Station
PTW	Public Tube Well
PW	Public Water
PWW	Public Water Work
R&M	Repair and Maintenance
RBI	Reserve Bank of India
REC	Rural Electrification Corporation
REL	Reliance Energy Limited
RESCOs	Rural Electric Supply Companies
RGGVY	Rajiv Gandhi Grameen Vidhyutikaran Yojana
RIMS	Regulatory Information Management System
RoCE	Return on Capital Employed
ROE	Return on Equity
RPH	Rajghat Power House
RPO	Renewable Purchase Obligation
RPS	Renewable Purchase Specification
RST	Retail Supply Tariff
RWA	Resident Welfare Association
S&LP	Security and Loss Prevention
SAC	State Advisory Committee
SBI	State Bank of India
SEBs	State Electricity Boards
SED	State Electricity Duty
SERC(s)	State Electricity Regulatory Commission(s)

SHPS	Sikidiri Hydel Power Station
SHR	Station Heat Rate
SIP	Small Industrial Power
SLP	Single Light Point
SRS	Software Requirement Specification
STPS Sarni	Satpura Thermal Power Station, Sarni
STQC	Standardization Testing Quality Certification
STW	Shallow Tube Well
SVRS	Special Voluntary Retirement Scheme
T&D	Transmission and Distribution Losses
TAI	Tea Association of India
TDL	Transmission & Distribution Loss
TERI	The Energy and Resources Institute
THDC	Tehri Hydro Development Corporation
TISCO	Tata Iron and Steel Co Ltd
ToD	Time of Day
ToU	Time of Use
TPC	Tata Power Company
Tradeco	Trading Company
TRANSCO	Transmission Companies
TSAs	Transmission Service Agreements
TVNL	Tenughat Vidyut Nigam Ltd.
UAEDCL	Upper Assam Electricity Distribution Company Limited
UCPTT	Unified Common Pool Transmission Tariff
UERC	Uttaranchal Electricity Regulatory Commission
UI	Unscheduled Interchange
UJVNL	Uttaranchal Jal Vidyut Nigam Ltd
UPCL	Uttaranchal Power Corporation Limited
UPPCL	Uttar Pradesh Power Corporation Limited
UREDA	Uttaranchal Renewable Energy Development Authority
VRS	Voluntary Retirement Scheme
VSS	Voluntary Saving Scheme

VSTPS	Vindhyachal Super Thermal Power Station
WBERC	West Bengal Electricity Regulatory Commission
WBPDC	West Bengal Power Development Corporation Limited
WBREDA	West Bengal Renewable Energy Development Authority
WBSEB	West Bengal State Electricity Board
WBSEB	West Bengal State Electricity Board
ZGRO	Zonal Grievance Redressal Officer

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Introduction

Background

In 2002, FOIR (Forum of Indian Regulators) and the Ministry of Power (MoP) had jointly awarded a study to TERI (The Energy and Resources Institute) for analyzing the tariff orders issued by State Electricity Regulatory Commissions (SERCs) till FY 2002-03. Under this study, a comprehensive survey of tariff orders issued by different SERCs was undertaken and the findings were compiled in a uniform format for all the states. In particular, the study had attempted to bring out the following:

- Comparison of approaches followed by SERCs towards different elements of annual revenue requirement (ARR).
- Compliance attained by the regulated utility with the costs approved and the directives issued by SERCs.
- Examination of regulatory effectiveness w.r.t. such parameters as T&D loss reduction, extent of tariff rationalization, employee productivity, etc.
- Identification of initiatives taken by SERCs that could be replicated in other states.

Significant developments have taken place in the power sector since this study was undertaken. Many states have established their regulatory commissions and have issued tariff orders. SERCs have also taken a variety of new initiatives to further their attempt to minimize inefficiencies that have been marking the system. The tariff rationalization process has also been carried forward by the regulatory commissions in their subsequent orders. The Ministry of Power also issued the National Tariff Policy in January 2006 that states the following:

Quote

Balancing the requirement of attracting adequate investments to the sector and that of ensuring reasonability of user charges for the consumers is the critical challenge for the regulatory process. Accelerated development of the power sector and its ability to attract necessary investments calls for, inter alia, consistent regulatory approach across the country. Consistency in approach becomes all the more necessary considering the large number of States and the diversities involved

Unquote

Keeping in view the above, it is pertinent to examine the tariff orders issued since 2002 to supplement the observations made from the study already conducted by TERI, and determine the

trend even further. The executive summary of the earlier study undertaken by TERI is attached as Annexure 1.1 of this report. A comparative analysis of the approaches adopted by regulatory commissions in different states especially while determining the Annual Revenue Requirement and tariff for the utilities can bring to light the consistency or inconsistency in approaches being adopted across the country. Moreover, the resultant policy recommendations would serve as a guide for policymaking for achieving a more constructive, robust and useful regulatory structure across the country.

It was in the above context that the Ministry of Power (MoP) awarded this study to The Energy and Resources Institute (TERI) for analyzing the tariff orders (distribution) issued by nine (9) State Electricity Regulatory Commissions (SERCs) during FY 2003-04, FY 2004-05 and FY 2005-06. The following states are covered in this study:

- 1) Andhra Pradesh
- 2) Assam
- 3) Delhi
- 4) Jharkhand
- 5) Kerala
- 6) Madhya Pradesh
- 7) Maharashtra
- 8) Uttaranchal
- 9) West Bengal

As part of this study, a comprehensive survey of tariff orders issued by these SERCs for the distribution licensees has been undertaken. In particular, this study attempts to bring out the following:

- Comparison of approaches followed by SERCs towards different components towards assessing the Annual Revenue Requirement (ARR).
- Compliance by the regulated utility with the costs approved and the directives issued by SERCs.
- Examination of regulatory effectiveness w.r.t. such parameters as T&D loss reduction, extent of tariff rationalization, employee productivity, etc.
- Identification of initiatives taken by SERCs that could be replicated in other states.
- Governance related parameters such as regulations issued, public participation in tariff determination process, timeliness of orders, consumer grievance redressal etc.

Scope of work

The terms of reference of this study as awarded by the MoP include an analysis of the following in the context of distribution tariff setting by SERCs.

1. Regulatory process including public participation and timeliness of tariff orders
2. Regulatory approach for revenue requirement including parameters such as sales/demand estimation, energy losses, depreciation, rate of return etc.
3. Tariff rationalisation and progress in cross subsidy reduction
4. Electricity duty collected by the utilities vis-à-vis the subsidy disbursed by the State Governments
5. Progress made by state in the implementation of Multi Year tariff framework
6. Trends in energy trading and the amount of revenue accrued to the utilities.
7. Directives issued by the regulatory commissions and their implementation
8. Regulatory effectiveness with respect to resultant efficiency improvement in energy loss levels, collection efficiency, metering and improvement in employee productivity etc.
9. Identifying regulatory initiatives including demand side management measures such as time-of-day (ToD) tariffs that could be replicated in other states.
10. Areas of deficiency or gap in regulation of tariff

However, in this study, TERI has made an attempt to go beyond the above scope of work and have included various other issues related to the power sector in each state including the following:

- Staffing of SERCs
- Status of regulations issued by SERCs
- Progress made on pen access
- Renewable portfolio standards
- Consumer grievance redressal mechanism
- Appeals against orders of SERCs
- Directives issued by State Government
- Anti-theft measures adopted in various states etc.

Methodology

The following steps were adopted to undertake a detailed analysis of each state and the preparation of this report.

Step 1: Database of tariff orders

Tariff orders issued by the nine states under study were procured through the websites of the SERCs and through requesting SERCs to the send the orders wherever not available on the website

Step 2: Analysis of tariff orders

A comprehensive survey of SERCs' orders on distribution tariff during the period FY 2003-04, FY 2004-05 and FY 2005-06 was undertaken based on the information available in the tariff orders. In many cases, orders issued for FY 2006-07 were also studied to incorporate the most accurate and updated information.

Step 3: Database of other documents available in public domain

Other documents available in the public domain like the Power Sector Rating Report undertaken by ICRA and CRISIL as mandated by the Power Finance Corporation at the instance of the Ministry of Power; Status on metering, rural electrification, APDRP, Annual Report (2001-02) on The Working of State Electricity Boards & Electricity Departments (Power & Energy Division), Planning Commission, Government of India, May 2002, Report on restructuring of APDRP, Ministry of Power etc. were also studied. In addition, reports specific to the state under study were referred to provide a detailed assessment of the state.

Step 4: Collection of information from the websites of SERCs and utilities

The websites of all the nine SERCs and the respective utilities were also scanned to gather information available on them.

Step 5: Collection of information from SERCs and utilities

The information contained in the tariff orders and other documents available in the public domain was insufficient to undertake the entire analysis for this study. Therefore, information and input requests were sent to all the 9 states under study. The project team also visited the states of Assam, Delhi, Kerala, Uttaranchal and West Bengal to have meetings and discussion with the SERCs and utilities.

Table 1 gives the list of the orders for the nine states that have been covered in this study.

Table 1 List of distribution tariff orders covered in the study

State	Month and year of operationalisation of ERC	FY 2003-04	FY 2004-05	FY 2005-06
Andhra Pradesh	March 1999	One order for 4 distribution companies	One order for 4 distribution companies	One order for 4 distribution companies
Assam	August 2001	Order not issued	1 order for ASEB (unbundled)	Separate orders for 3 distribution licensees
Delhi	December 1999	3	3	3
Jharkhand	April 2003	1 (JSEB)	Order not issued	Order not issued
Kerala (KSEB)	November 2002	1	1	1
Madhya Pradesh	July 2001	1 (MPSEB) Combined for FY 2003-04 and FY 2004-05		1
Maharashtra	August 1999	1 (MSEB)		1 (MSEB)
Uttaranchal	September 2002	1	1 (UPCL) - Combined with FY 2005-06	
West Bengal	January 1999	1 (WBSEB) Combined for FY 2003-04 and FY 2004-05		1

Source: TERI Compilation

Wherever available, information has been sourced from tariff orders issued by the SERCs and annual accounts of the state utilities. However, information on parameters like status of metering, rural electrification and APDRP has been taken from the data available on the website of Ministry of Power.

Parameters studied

The analysis undertaken for the 9 states broadly covers the areas of consumption and access, efficiency improvement, tariff rebalancing and governance. A study of these parameters will help in analysis of both physical and financial performance of the power sector in the state and bring out the useful lessons to be learnt from various state experiences. It shall also facilitate SERCs in regulatory decision making. Each state chapter is structured similarly based on the following parameters.

1. Introduction

This section gives a brief overview of the status of power sector reforms in the state including the year of establishment of SERC, status of unbundling and tariff orders issued, demand-supply gap and installed capacity in the state.

2. Consumption and access

The National Electricity Policy aims for electricity demand to be met fully by 2012; energy and peaking shortages to be overcome and adequate spinning reserve to be created. It further aims to increase per capita availability of electricity to over 1000 units by 2012. Thus, as rightly mentioned in the Tariff Policy, the development of power sector has to meet the challenge of

providing access for electricity to all households in the next five years. In view of these objectives, it is vital to study the approaches adopted by the ERCs in estimating demand of electricity in their respective states and also track the movement in consumption of electricity for different consumer categories.

The following parameters have been studied for each state in this regard:

- (a) Sales/demand estimation approach
- (b) Category wise movement in sales
- (c) Contribution of various categories in sales and revenue
- (d) Movement in number of consumers and connected load
- (e) Trend in consumption per consumer and connected load per consumer
- (f) Rural electrification levels

3.Efficiency improvement

The Tariff Policy states that the key to success of power sector reforms lies in making the distribution segment of the industry efficient. It further mentions that efficiency in operations should be encouraged. In this context, the following parameters of efficiency have been analysed in this study.

- (a) Approach for fixing loss reduction targets
- (b) Movement in T&D loss (targets vis-à-vis actuals)
- (c) Collection efficiency
- (d) AT&C loss
- (e) Status of metering
- (f) Fuel cost of power generation and power purchase costs
- (g) Energy trading and Unscheduled Interchange charge
- (h) Operation & Maintenance costs: Employee costs and productivity, Repair & Maintenance expenses, Administrative & General expenses, Depreciation, Interest & Finance Charges and various sources of funds, Bad debts, Return etc.
- (i) Trend in total Annual Revenue Requirement (ARR)

Expenses like employee costs have been studied in detail through employee productivity (employee costs as a percentage of ARR, employee cost per unit of sale, number of employees per thousand consumers, number of employees per million units sold, revenue per employee); Repairs & Maintenance expenses as a percentage of Gross Fixed Assets and as a percentage of total operating

expenses and ARR; Administrative & General expenses as percentage of ARR and as a percentage of total operating expenses; Interest costs as a percentage of total operating expenses and ARR. Apart from these, the approach adopted by the SERC in estimating depreciation and return has also been studied.

4. Tariff rebalancing

Section 61 (g) of the Electricity Act 2003 states that the Appropriate Commission shall be guided by the objective that the tariff progressively reflects the efficient and prudent cost of supply of electricity. Further, the State Governments can give subsidy to the extent they consider appropriate as per the provisions of section 65 of the Act.

The Tariff Policy states that direct subsidy is a better way to support the poorer categories of consumers than the mechanism of cross-subsidizing the tariff across the board. The following parameters have been analysed to study the approach adopted in various states towards meeting this objective of tariff rationalisation.

- (a) Approach to tariff rationalisation
- (b) New initiatives in tariff determination and design like Multi Year Tariff setting, Time of day tariff, special tariff for use of renewables
- (c) Category wise average tariff
- (d) Cross subsidy
- (e) Subsidy support from government
- (f) Revenue gap
- (g) Electricity duty

5. Governance

The various parameters studied under this head contribute to assessing the state's performance on governance issues and regulatory process issues as given below.

- (a) Public participation in tariff setting process
- (b) Timeliness of tariff orders
- (c) Consumer advocacy and Redressal mechanism
- (d) Anti theft measures
- (e) Open access
- (f) Appeals against orders of the SERCs
- (g) Studies undertaken on the power sector in the state
- (h) Staffing of SERCs
- (i) Directives issued by SERCs and their compliance
- (j) Regulations issued by the SERC
- (k) Status of Annual Accounts of the utilities

Data constraints faced

The aforementioned analysis has been mainly dependent on data available in the tariff orders. Some of the chief constraints that were faced in this regard are as follows.

- (a) All tariff orders do not provide information on category-wise revenue from existing, proposed and approved tariff. Similarly, many tariff orders do not contain information on existing, proposed and approved sales.
- (b) Information on category wise number of consumers, connected load and details of original cost of fixed assets, capital expenditure, interest rates for loans, depreciation rates etc are also not available in all tariff orders.
- (c) In the case of some states like Assam, Maharashtra, Madhya Pradesh and West Bengal combined tariff orders have been issued for two years (three years in case of WBSEB). In some case like Jharkhand (JSEB) only one tariff order is available. This restricts the information available in public domain and hence the analysis
- (d) Further, in some states, in the subsequent tariff orders information on actuals has not been provided.
- (e) Annual Accounts in most states have not been audited on time and therefore comparison with actuals has not been provided in those states

An important observation that is made from the analysis of the tariff orders is that the states have not followed a uniform structure of orders over the years and the information contained in orders of different states is also not uniform. In many states basic information/data like number of consumers and connected load, category wise revenue and average tariff (at existing, proposed and approved tariffs), status of action taken by utilities on directives issued by SERCs, actual expenditure incurred and revenue earned by utilities vis-à-vis approved figures etc is not available. Absence of such information in the public domain results in information asymmetry and the stakeholders are unable to understand the progress being made in the state's power sector in totality. It is therefore necessary that all the SERCs come to a decision on the information that all tariff orders must contain, it may also be useful for all SERCs to prepare a uniform structure for the tariff orders.

Another constraint that was faced was the lack of adequate information on the websites of the utilities and the Regulatory Commissions. Web resources are not being utilized efficiently and effectively by these organisations to disseminate information

available with them. In most states, the websites of utilities did not have the Annual Accounts and information like the composition of their Boards, updated information on actual data on sales, number of consumers; employee strength. In the case of SERCs, information on the budgets, Annual reports of SERC and the complete filings made by the utilities was not available.

CHAPTER 1 Key Findings

Introduction

This chapter collaborates the analysis of distribution tariff orders issued by nine states, namely, Andhra Pradesh, Assam, Delhi, Jharkhand, Kerala, Madhya Pradesh, Maharashtra, Uttaranchal and West Bengal for FY 2003-04 to FY 2005-06. The key findings of this study have been presented in four major sections:

- Form of regulation
- Process of regulation
- Impact of regulation
- Recent developments in regulatory practice

The first section looks at the present system of regulation and tariff setting followed in India.

The second section analyses the various aspects of regulatory process like public participation, consumer redressal, regulations issued, compliance by utilities on the directives issued by SERCs and status on various regulations issued by them.

The third section deals with the impact of regulation and orders on various efficiency parameters like loss, collection efficiency, costs elements including power purchase, employee costs, administrative and general expenses, repair and maintenance expenditure, interest and finance costs, bad debts and tariff issues like tariff structures and innovative features of tariff structures, movement in average tariff and costs etc.

The fourth section studies the recent regulatory developments taking place in the power sector including multi year tariffs, open access and renewables in the states under study.

Form of regulation

The ROR regulation is the traditional approach to regulation. Under this, rates are set so as to enable a utility reasonable opportunity to recover prudently incurred expenses (including investment) and a fair return on the remaining cost (the un-depreciated portion) of investment. So far, states in India follow this approach of regulation in the electricity sector.

Rate-of-return regulation provides the regulated companies with sufficient incentives for capacity expansion and even creates incentives for overcapitalization¹. However, this approach does

¹ Often referred to as 'gold plating'

not provide incentives for cost savings and efficiency improvements but rewards over investments unless there is some form of efficiency benchmarking connected to it.

With the move towards MYT regimes, SERCs are trying to move towards Performance Based Regulation (PBR). PBR mechanism provides more powerful incentives for regulated firms to reduce costs, improve service quality in a cost effective way, stimulate the introduction of new products and services, and stimulate efficient investment in and pricing of access to regulated infrastructure services.

Performance based system gives direction to regulated firms. The firms can choose the way in which they want to meet these targets. The regulator sets the targets for the key performance parameters of the utility and calculates the tariffs assuming that the targets are met. If the utility exceeds the targets, it would make profits and if it falls short there is profit reduction or even loss. PBR makes use of the information advantage. The regulator thus controls less behaviour and rewards outcomes. However, even in this move towards PBR, it is observed that adequate flexibility is not being given to the utilities and it does not do away with the present system of annual review. This is discussed in greater detail later in this chapter in the section on multi-year tariff regulation.

Process of regulation

Status of reform

Table 1.1 gives the status of unbundling in the 9 states under study.

Table 1.1: Status of unbundling in 9 states under study

State	Electricity sector	Year of unbundling
Andhra Pradesh		February 1999
Generation company	APGENCO (Andhra Pradesh Generation Corporation Ltd)	
Transmission company	APTRANSCO (Transmission Corporation of Andhra Pradesh Ltd)	
Distribution companies	APEPDCL (Eastern Power Distribution Company Limited of Andhra Pradesh) APCPDCL (Central Power Distribution Company Limited of Andhra Pradesh) APNPDCL (Northern Power Distribution Company Limited of Andhra Pradesh) APSPDCL (Southern Power Distribution Company Limited of Andhra Pradesh)	
Assam		December 2004
Generation companies	APGCL (Assam Power Generation Corporation Limited)	
Transmission company	AEGCL (Assam Electricity Grid Corporation Limited)	
Distribution companies	LAEDCL (Lower Assam Electricity Distribution Company Limited) CAEDCL (Central Assam Electricity Distribution Company Limited) UAEDCL (Upper Assam Electricity Distribution Company Limited) Bulk Supply Trader: ASEB	

12 Analysis and compilation of tariff orders

State	Electricity sector	Year of unbundling
Delhi		November 2001
Generation company	GENCO (Indraprastha Power Generation Company Ltd)	
Transmission company	TRANSCO (Delhi Power Supply Company Ltd)	
Distribution companies	BRPL (BSES Rajdhani Power Limited) BYPL (BSES Yamuna Power Limited) NDPL (North Delhi Power Limited)	
Jharkhand	Unbundling has not yet taken place	NA
Kerala	Unbundling has not yet taken place	NA
Madhya Pradesh		June 2005
Generation company	MPPGCL (Madhya Pradesh Power Generating Company Ltd)	
Transmission company	MPPTCL (Madhya Pradesh Power Transmission Company Ltd)	
Distribution companies	Madhya Pradesh Paschim Kshetra Vidyut Vitran Company Ltd. Madhya Pradesh Poorva Kshetra Vidyut Vitran Company Ltd. Madhya Pradesh Madhya Kshetra Vidyut Vitran Company Ltd.	
Trading company	MP Power Trading Company ('Tradeco' or 'MP Tradeco').	
Maharashtra		June 2005
Generation company	MSPGCL (Maharashtra State Power Generation Company Limited)	
Transmission company	MSTCL (Maharashtra State Transmission Company Limited)	
Distribution company	MSEDCL (Maharashtra State Electricity Distribution Company Limited)	
Holding Company	MSEB Holding Company	
Uttaranchal		June 2004
Generation company	UJVNL (Uttaranchal Jal Vidyut Nigam Ltd)	
Transmission company	PTCUL (Power Transmission Corporation of Uttaranchal Limited)	
Distribution company	UPCL (Uttaranchal Power Corporation Limited)	
West Bengal	Restructuring announced in January 2007	January 2007

SOURCE TERI Compilation

In 3 out of the 9 states under study unbundling has not taken place yet, these are, Kerala, Jharkhand and West Bengal².

Public participation and timeliness of orders

Table 1.2 highlights the adequacy of public participation in the tariff setting process across the states under study and the timeliness of orders issued by the SERCs.

² On 24th January 2007, the bifurcation of the West Bengal State Electricity Board (WBSEB) was approved by the Cabinet. According to the approved scheme, two new government companies would be formed with effect from 1st April 2007, but the final transfer scheme would be formulated within one year after closure of accounts of the WBSEB for 2006-07. The West Bengal State Electricity Transmission Company Limited (WBSETC) would look after transmission and state load despatch functions, while the distribution and hydro-business are to be vested with the West Bengal State Electricity Distribution Company Limited (WBSERC).

Table 1.2: Public participation and timeliness of orders across 9 states under study

S.No.	States	Number of participants in the hearing process in tariff review process (FY 2005-06)	Timeliness of orders
1	Andhra Pradesh	185	On time
2	Assam	19	On time
3	Delhi	98	On time
4	Jharkhand	104	On time ³
5	Kerala	33	On time
6	Madhya Pradesh	104	On time
7	Maharashtra	13432*	Delayed ⁴
8	Uttaranchal	175	On time ⁵
9	West Bengal	22	On time

*FY 2006-07

SOURCE TERI assessment and compilation

From the above table it is evident that the level of public participation has been low in most states in terms of number of participants in the hearing process. In Assam, Kerala and West Bengal very few objectors participated in the hearings. Further, the numbers of written objections are even lower than the number of representations made during the hearings. This highlights that even though public has an opportunity to participate in regulatory process with the establishment of SERCs, not much progress has been made on this front. It is also observed that participation of domestic and agricultural consumers is limited in the regulatory process. For instance, in Assam the objections have primarily been from Industry and Commercial establishments with low response from domestic consumers. Similarly in Kerala, the major objections have been from the Industrial consumers, associations, chambers of commerce with limited participation from the domestic consumers⁶.

A number of SERCs have taken some initiatives to encourage public participation. Some of these are discussed below.

- Jharkhand State Electricity Regulatory Commission - The Commission initiated “Kya aap jaante hain” series to educate the consumer about their rights in terms of availing electricity supply from the Board. As part of this initiative, the

³ There were no tariff orders issued for FY 2004-05 and FY 2005-06 due to non-filing of tariff petition

⁴ There were no tariff orders issued for FY 2004-05 and FY 2005-06 due to non-filing of tariff petition

⁵ There was however, considerable delay in acceptance of the petition by the Commission on the ground that adequate information was not made available in the petition

⁶ One reason for the same may be because no hike in tariff proposed by the KSEB in any of the above years. The KSERC has made efforts to increase consumer participation in the tariff setting process however the number of objections received still remains low.

Commission periodically publishes information about facilities that consumers can avail and the provisions laid by the Commission for the betterment of the service in the leading newspapers. Under this series a case came into light wherein a village under Ranchi zone filed a petition before the Commission against the Board for being denied connection, despite filling the application as per the rules and paying the requisite amount. In response to the same, electrification work was started in the village.

- Kerala Electricity Regulatory Commission - In FY 2005-06, the Commission conducted a workshop on “Effective consumer intervention in ARR”, so as to encourage consumers to participate in the tariff fixation process. The workshop was attended by a number of people including representatives from consumer organisations. Although the number of objections still remain low, but it was a good measure initiated by the Commission.

From the tariff orders and discussions with the stakeholders, it can be stated that Commissions needs to improve/enhance their efforts to reach consumers so that public participation in the tariff fixing process is more effective.

As regards timeliness of orders, almost all the SERCs (under study) except Maharashtra State Electricity Regulatory Commission have issued the orders on time. In a number of cases it was observed that there was a considerable gap in the submission of the tariff petition by the utility and the final acceptance of the order. This has been the case in Jharkhand and Uttaranchal. The delay, according to the Commissions was primarily because of inadequate information submitted by the utility.

Consumer Grievance Redressal

The Electricity Act 2003 provides a comprehensive legal framework for consumer grievance redressal. Section 42 (5) of the Act makes it mandatory for the distribution licensee to establish a forum for redressal of grievances of the consumers in accordance with the guidelines as may be specified by the SERC. Such a grievance redressal forum was to be established within six months by the licensee from the grant of license to it. The Electricity Rules 2005 provided for this forum to consist of officers of the licensee only. However, the rules were amended in 2006 to include in this forum, one independent member familiar with consumer affairs to be nominated by the Commission. Even after this amendment, which is a step in the right direction, aggrieved consumers will continue to represent to a forum

consisting mainly of utility officials. This may raise question marks on the impartiality of the forum's decision.

The Act also provides that any consumer, who is aggrieved by non-redressal of his grievance by the forum, may make a representation to an authority to be known as Ombudsman to be appointed or designated by the SERC. The Ombudsman is required to settle the grievance of the consumer within time and manner as may be specified by SERC⁷. Alternatively, a consumer can also approach consumer courts directly for redressal of his grievance (Figure 1.1).

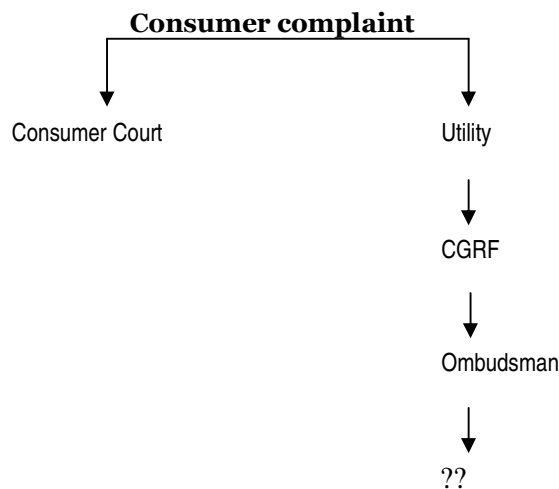


Figure 1.1. Consumer grievance redressal mechanism in India

However, if the consumer is not satisfied by redressal of his grievance by Ombudsman, whether or not he can approach the commission, is not specified in the Act. This has given rise to doubts about the issue of regulator's jurisdiction in redressing the consumer grievances. For instance, in 2005, Maharashtra Electricity Regulatory Commission (MERC) ordered the distribution companies to refund the money to consumers on a billing related dispute. The distribution companies appealed before the Appellate Tribunal for Electricity (ATE) on the order passed by the MERC. In a judgement passed in March 2006, the ATE concluded that SERCs have no jurisdiction to entertain consumer petitions on such matters when Section 42(5) to (8) already provides the powers to consumer forums and ombudsman to adjudicate in such disputes. The MERC along with few other consumer groups have appealed against the ATE's order and the matter is pending in the Supreme Court of India.

⁷ As on April 2006, 19 SERCs have institutionalized grievance redressal forum and Ombudsman

Consumers expect the Commission to resolve their grievances particularly those relating to the quality of supply, billing and metering. However, as the Act is ambiguous on the subject, the role of SERCs in grievance settlement needs to be clarified.

Consumer advocacy

Some SERCs have set up dedicated consumer advocacy cells to effectively monitor compliance of performance standards and redressal of grievances of consumers. Karnataka Electricity Regulatory Commission (KEREC) has the distinction of being the first regulatory commission to establish a full-fledged office for Consumer Advocacy to represent common interests of consumers. Assam State Electricity Regulatory Commission (AERC) has also created similar forum. This Cell at the AERC was established to assist and empower consumers to effectively take part in different regulatory functions of the Commission. The main objective of this is to involve consumers in the power sector reform process in the state through active participation in the public hearings and other- discussions organized by the Commission.

Table 1.3 gives the Status of Consumer grievance and redressal mechanism across 9 states under study. It also gives the status of the standard of performance regulations which has an important bearing on the quality and reliability of supply to the consumers.

Table 1.3: Status of consumer grievance and redressal mechanism

S.No.	States	Ombudsman appointed and functioning	Consumer Grievance Redressal Forum	Standards of performance issued
1	Andhra Pradesh	√	√	√
2	Assam	X	√	√
3	Delhi	√	√	√*
4	Jharkhand	√	√	√
5	Kerala	X	√	√
6	Madhya Pradesh	√	√	√
7	Maharashtra	√	√	√
8	Uttaranchal	√	√	X
9	West Bengal	√	√	√

*Only metering and billing

√ - Appointed and functioning; X- Not appointed

SOURCE TERI compilation

Some of issues being dealt with by Ombudsman include those related to metering and billing (incorrect meter readings, fast meters, wrong billing and disconnection, unauthorized use of electricity, refund of excess billing, assessment of bill for slow meter and excess connected load); theft and pilferage (Theft of electricity; tampering of meter seals and assessment of bill); arrears (recovery of past arrears, arrears of old consumer in the

same premises); excess connected load (charges for excess connected load, additional load and maximum demand violation charges) etc. However, limited information is available in the public domain on the functioning of the Ombudsman. There is also a need for a study to be undertaken on consumer grievances and response of Commissions and Utilities on such grievances.

Anti-theft measures

The EA 03 lays down strict guidelines with reference to theft of electricity and specifies that any person indulging in theft/stealing of electricity shall be punishable with imprisonment for a term, which may extend to three years or fine or both. It further specifies that in case any complaint is filed before the Appropriate Commission by any person or if that Commission is satisfied that any person has contravened any provisions of this Act or rules or regulations made there under, or any direction issued by the Commission, the Appropriate Commission may after giving such person an opportunity of being heard in the matter, by order in writing, direct that, without prejudice to any other penalty to which he may be liable under this Act, such person shall pay, by way of penalty, which shall not exceed one lakh rupees for each contravention and in case of a continuing failure with an additional penalty which may extend to six thousand rupees for every day during which the failure continues after contravention of the first such direction.

It also specifies that State Government may, for the purposes of providing speedy trial of offences referred to in sections 135 to 139 (related to theft), by notification in the Official Gazette, constitute as many Special Courts as may be necessary for such area or areas, as may be specified in the notification. It further states that notwithstanding anything contained in the Code of Criminal Procedure, 1973, every offence punishable under sections 135 to 139 shall be triable only by the Special Court within whose jurisdiction such offence has been committed.

Most SERCs under the study have directed the respective utilities to undertake strict measures to curb theft and hence reduce the level of losses. Actions initiated in the states under the study are summarized below: -

In Andhra Pradesh, the discoms are currently using software 'Consumer Analysis Tool (CAT)' that helps analyse the consumption pattern of different categories. In case of any abnormality, the officials of the DISCOM inspect the premises to ensure that there is no power theft. Further, there are 'Anti Power Theft Squads (APTS)' from the Andhra Pradesh Police. This squad is divided into 'Detection and Pilferage of Energy (DPE)' teams that are entrusted with the responsibility to conduct raids

and surprise checks. If any theft is found, these teams register cases and initiate action to prosecute the offenders. There are however, no special courts for dealing with cases related to theft. These measures have been one of the contributing factors towards reduction in losses and improvement in collection efficiency of the discoms.

In Assam, anti theft teams have been set up in each sub division and officers appointed to detect unauthorised connections and theft. In addition, the Chief Vigilance Officer with his Security personnel has formed a special team at the headquarters level to conduct anti theft drives. However, at present, no special courts have been set up to deal with the issue of theft. These measures have resulted in improvement in collection efficiency of the discoms over the years.

In Delhi, the Government of National Capital Territory of Delhi (GoNCTD) has deployed the Central Industrial Security Force (CISF) to strengthen anti-power theft operations and extend security cover to the distribution utility personnel taking part in the action against electricity pilferage. The CISF coverage, has been extended initially to high theft area handled by BSES Yamuna Power Ltd. and is planned to be extended to the other two zones of Delhi. In addition, Special Courts dedicated for handling cases related to power theft have been established at Patparganj (BYPL area), Vikaspuri (BRPL area) and Malviya Nagar (BRPL area). Discoms in Delhi in view of the efforts made have been able to bring down the losses considerably and have overachieved the target set in the policy directions.

In Jharkhand, the Government in order to reduce power theft and expedite the booking of the incident of theft, appointed a Deputy Inspector General (DIG) responsible for handling theft related cases. Formulation of the special courts is still pending. Moreover, JSEB in FY 2006-07 has reported an increase in the total AT&C losses in the State.

In Kerala, KSEB has constituted an anti-theft squad in the Board headed by the Inspector General of Police, which is responsible for detection of thefts and recovery of revenue. Total number of inspections in FY 2004-05 was 10287 and the amount assessed was Rs. 40.46 Crore. However, no special courts have been established in the state. Although the Board maintains good collection efficiency, there have been problems in recovering dues particularly from the Government Departments, public sector units and dues withheld due to protracted litigation by private consumers.

In Madhya Pradesh, a number of anti-theft measures have been undertaken in the state including setting up of special courts and constitution of anti-theft squads. In addition, technical measures taken up by the discoms include replacement of LT line with bare conductor by cable, shift of meters from the interior of the building to the entrance point of the building in many cities. However, not much public awareness has been generated to encourage the consumers in this regard.

In Maharashtra, MSEB/MSEDCL has taken a number of initiatives to curb theft viz. special drives in theft prone areas; incentive scheme has been announced to encourage the general public and the staff of the utility to report information on theft and other such irregularities causing loss of revenue to the utility. In addition, Government of Maharashtra has established 6 police stations to be used exclusively for detecting thefts. The Government is also likely to set up special courts. The measures have resulted in decrease in the AT&C losses.

In Uttaranchal, the Government of Uttaranchal (GoU) has constituted 13 Special Courts, one in every district for the trial of offences related to the misuse and theft of electricity. GoU has also designated Executive Engineers as Assessing Officers and constituted District level Committees. In FY 2006-07 (half yearly report) the total number of consumers found stealing electricity in Dehradun and Haldwani was 1312 and Rs. 34.66 Crore was recovered from them.

In West Bengal, power theft vigilance raids by DISCOMS have resulted in FY 2005-06 registering 1552 theft cases and 566 cases that have been convicted. Discoms have also introduced innovative measures of tracking power theft through 'toll free phone facility'. This facility provides free phone service to electricity consumers to inform the utility about power theft. However no special courts have been established to deal with cases related to power theft.

While states have taken several initiatives to reduce the incidence of theft, losses still remain high. This has been discussed in detail later in this chapter.

Compliance of directions issued by SERCs

All SERCs have issued directives on various issues to the licensees in their tariff orders. Some of the major issues on which directives have been issued by SERCs are:

1. Study to estimate T&D losses and gains in loss reduction on account of investments including those under APDRP
2. Plan to reduce T&D losses

3. Computerisation of billing and introduction of Management Information System
4. Undertake energy audit
5. Replace faulty meters
6. Undertake costs of service studies
7. Conduct consumer load profiling surveys and set up load research Centre
8. Submit information and proposals to introduce ToD tariff with details on metering facility, consumption pattern and proposed incentive.

Out of the 9 states under study, Regulatory Commissions of only three states, namely, Andhra Pradesh, Assam and Delhi have given the status of compliance of the directives issued by them in earlier orders. Uttaranchal Electricity Regulatory Commission (UERC) had also issued several directives to the licensees in FY 2003-04, most of which were not complied with. In FY 2005-06 order, UERC expressed concern over non-compliance and constituted a Committee of Experts to examine the status and quality of compliance of its directives. In its report-dated 26th May 2005 (tariff order FY 2006-07), the Committee has given the status and its own assessment of compliance of each direction reviewed by it. The Committee concluded that most of the directives issued by the Commission have not been complied with and that the quality of information being submitted to the Commission left much to be desired.

There is no regular monitoring of compliance and status reporting done by the licensee on the directives issued by the SERC. Thus, in effect, it is observed that in many cases the Commissions are still issuing directives on subjects that the licensee was to comply with in the very first tariff order issued.

It is also observed that in many states a large number of directives are issued in every order. The licensees may at times not be able to comply with all the directives given. It may be useful for the SERCs to prioritize the directives issued and then monitor them accordingly to ensure that directives that are extremely important and relevant for further development of the power sector are complied with. Some of these could be directives related to T&D loss estimation and reduction plan, demand forecast studies, demand side management studies, metering plan and replacement of faulty meters, consumer satisfaction surveys etc.

Studies undertaken

Though most SERCs have been undertaking studies on various issues related to the state power sector, these studies or the key findings of these studies are not in the public domain. In the

interest of greater transparency these studies should be made available on the websites of the SERCs.

A recent study “Electricity Sector Governance in India: An Analysis of Institutions and Practice. Application of the Electricity Governance Indicator Toolkit in India” also recommended that mechanisms to operationalise various transparency, accountability and participation related provisions in the Act and regulations, through measures such as easy access to all relevant information and documents, provision of greater democratic space for civil society participation and easy access to redressal mechanisms need to be created by the regulatory commissions.

Information available in public domain

All SERCs under study have a functioning website. The tariff orders and regulations issued by the SERCs are available on the websites of all SERCs. However, large quantum of information which the SERCs have on the state power sector due to their continued interaction with the licensees and which is of interest to the consumers and stakeholders is not available on the websites. It is important that all SERCs develop a Regulatory Information Management System and the information be made accessible to the public.

Delhi Electricity Regulatory Commission (DERC) has introduced a comprehensive Regulatory Information Management System (RIMS) that has been functional since last 11 months. The system specifies a format in which the utilities are to submit/file their information with the Commission. Licensees are able to submit this information online and have the flexibility to upload revised drafts of the same document. Currently, DERC is in close interaction with licensees to further improve upon the system and to make the formats conducive to multi-year tariff framework once it is implemented in Delhi. Institutionalising RIMS is a good initiative taken by DERC to reduce information asymmetry and develop an information repository.

Since institutionalising RIMS takes time consuming task, SERCs must take steps in the interim to make available as much data and information as possible to the public through their websites. The steps taken by the Madhya Pradesh Electricity Regulatory Commission (MPERC) can be followed by other Commissions in this respect. The website of the MPERC not only has all the regulations and orders issued by the Commission, but it also contains the entire petition (including the supporting excel worksheets) submitted by the licensee. Apart from this, the website also has a dedicated section containing circle and division

wise information on various parameters for all entities regulated in Madhya Pradesh. This includes the following information:

1. Geographical presentation of transformer
2. Geographical presentation of distribution losses
3. Geographical Presentation of circle-wise % of un-metered consumers, status of employees & collection efficiency
4. Circle-wise distribution losses
5. Cumulative division wise losses
6. Annual collection efficiency
7. Transmission performance reports
8. Quarterly performance standards of discoms
9. Circle-wise Performance Data of utility
10. Accelerated Power Development and Reforms Programme (APDRP)
11. Accelerated Power Development Reform Programme Status
12. Company wise - Work-wise position of APDRP
13. Daily Transformer failure reports of discoms
14. Break Down/Outage of generating units
15. Consumer category wise status of Appellate Authority
16. Annual Details of DTR's failure/replacement
17. Un-metered consumers

This kind of information is extremely helpful for all stakeholders to review the progress being made in power sector reform in the state. MPERC is also in the process of operationalising a Regulatory Information Management Systems (RIMS).

The Jharkhand State Electricity Regulatory Commission (JSERC) has also taken an innovative step to make available information to the public and stakeholders. Apart from using their website, JSERC has also installed computer kiosk at its office (through touch screen). This kiosk contains all information on the state power sector and is regularly updated. The information can be accessed by the public without an costs or payment.

Status of important regulations issued

Table 1 .4 gives the status of important regulations (open access, intra state trading, multi-year tariff, standards of performance, ombudsman and guidelines for redressal of consumer grievances) that are required to be issued by the Electricity Regulatory Commissions under the Electricity Act 2003.

Table 1.4: Status of important regulations to be issued by SERCs of 9 states under study

S.No.	States	Open access	Method for computation of open access surcharge finalised	Intra state trading	Multi-year tariff	Standards of performance	Ombudsman	Guidelines for redressal of consumer grievances
1	Andhra Pradesh	√	√	√	√	√	√	√
2	Assam	√	√	√	√	√	√	√
3	Delhi	√	X*	√	√ (draft)	√ (metering & billing)	√	√
4	Jharkhand	√	√	√	√ (draft)	√	√	√
5	Kerala	√	√	X	√	√	√	√
6	Madhya Pradesh	√	√	√	√	√	√	√
7	Maharashtra	√	√	√	√	√	√	√
8	Uttaranchal	√	√	X	X	X	√	√
9	West Bengal	√	√	X	√ (draft)	√	√	√

√ - Issued; X- not issued

* Phasing to begin from 2007

SOURCE TERI compilation

From the above table, it is clear that almost all states under study have issued important regulations under the Electricity Act 2003. However, the content of the regulations is an issue of concern. In many states, the open access regulations do not detail the various charges that have to be levied and the formula that would be used to estimate these charges. Also, MYT regulations do not give the trajectory and targets for various parameters.

Staffing

With the initiation of the reforms and subsequent enactment of the Electricity Act 2003, there has been spurt of new activities that the Regulatory Commission are expected to undertake. Increasingly, complex economic and technical issues are now coming to the front and the ERCs not only have to be innovative in balancing the interests of various stakeholders but also have to guard their own credibility. Some of the important functions that SERCs are to undertake as per Electricity Act 2003 (Sec 86) are given below: -

- To determine the tariff for generation, supply, transmission and wheeling of electricity, wholesale, bulk or retail, as the case may be, within the State
- Regulate electricity purchase and procurement process of distribution licensees including the price at which electricity shall be procured from the generating companies or licensees or from other sources through agreements for purchase of power for distribution and supply within the State
- Facilitate intra-state transmission and wheeling of electricity
- Issue licenses to persons seeking to act as transmission licensees, distribution licensees and electricity traders with respect to their operations within the State

- Promote cogeneration and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution license
- Adjudicate upon the disputes between the licensees, and generating companies and to refer any dispute for arbitration
- Specify State Grid Code consistent with the Grid Code specified under clause (h) of sub-section (1) of section 79
- Specify or enforce standards with respect to quality, continuity and reliability of service by licensees
- Fix the trading margin in the intra-State trading of electricity, if considered, necessary

In addition to the above, the State Commissions are also responsible for advising the State Government on matters related to the following: -

- Promotion of competition, efficiency and economy in activities of the electricity industry
- Promotion of investment in electricity industry
- Reorganization and restructuring of electricity industry in the State
- Matters concerning generation, transmission, distribution and trading of electricity or any other matter referred to the State Commission by that Government

In the above context, the National Electricity Policy notified by the Ministry of Power also stresses the need for building the regulatory capacity in the states. Sec 6.2 of the policy states that:

Quote

Appropriate Governments need to take steps to attract regulatory personnel with required background. The Government of India would promote the institutional capability to provide training to raise regulatory capacity in terms of the required expertise and skill sets. The appropriate Governments should provide financial autonomy to the Regulatory Commissions. The Act provides that the appropriate Government shall constitute a Fund under section 99 or section 103 of the Act, as the case may be, to be called as Regulatory Commission Fund. The State Governments are advised to establish this Fund expeditiously.

Unquote

With the sector being in an extremely dynamic phase of development and several regulatory challenges to be addressed today and those that may arise in the future, there is need to develop adequate expertise in various fields viz. regulation, economics, finance, legal and technical. In the context of the

above provision, it must be noted that Regulatory Commission Fund has been constituted in a number of states including Andhra Pradesh, Gujarat etc; however it is yet to be formed at the Central level. As of now, all the ERCs under study are 3 member Commissions. However, ERCs of Jharkhand, Uttaranchal, Kerala and Delhi were initially established as a single member Commission.

Table 1.5 highlights the number of professionals (excluding Chairman, Members, Secretary and support staff) in ERCs of 9 states under study.

Table 1.5: Staffing in SERCs across 9 states under study

S.No.	States	Number of professionals*
1	Andhra Pradesh	19
2	Assam	6
3	Delhi	16
4	Jharkhand*	2
5	Kerala**	4
6	Madhya Pradesh	22
7	Maharashtra	20
8	Uttaranchal	9
9	West Bengal	7

* Both are as consultants, **Two out of these are consultants

SOURCE TERI assessment and compilation

As is seen from the table above, in most states the professional staff to undertake various activities of the Commission is generally inadequate. One of the reasons for the same has been lack of support and promptness from the State Government in sanctioning the requisite staff. In some states, while the SERCs have submitted plan for large number of staff, the State Government has not sanctioned the same. For instance, in Kerala out of total of 43 staffs requested by KSERC, the State Government sanctioned only 13. Similarly, JSERC in Jharkhand lacks adequate numbers of posts for various activities.

In some cases, the Commissions are not allowed to recruit professionals except consultants and officials on deputation from other Government organizations. With tenure of these officials being three to five years, the Commissions fail to build institutional memory with most of the staff unaware of the past happenings. Delhi and Jharkhand are states facing such problems.

In addition to the above, another striking fact that was reported during the study was that in Assam, the State Government has appointed an Advisor (Finance) and all the expenditure and bills of Assam Electricity Regulatory Commission (AERC) are sanctioned only after approval from the Financial Advisor. Such

restrictions hamper the independence that the Regulatory Commission should have in carrying out its activities.

Impact of regulation

Consumption and access

To assess the parameter of consumption in the states, this study looks at the trend in sales, number of consumers and connected load. Table 1.6 provides the classification basis for the trend in sales, number of consumers and connected load based on the growth in these parameters.

Table 1.6: Classification of trend in growth sales, number of consumers and connected load

Growth rate	Classification
0-3%	Low
3-5%	Moderate
5-10%	High

Table 1.7 gives the trend in consumption and load pattern across 9 states under study from FY 2003-04 to FY 2005-06.

Table 1.7: Trends in consumption and load patterns across 9 states under study from FY 2003-04 to FY 2005-06

States	Sales trend	Consumer number	Connected load
Andhra Pradesh	High	Moderate	Moderate
Assam	High	High	High
Delhi	High	High	High
Jharkhand	High	High	High
Kerala*	High	High	Moderate
Madhya Pradesh	High	Low	Moderate
Maharashtra*	High	Low	High
Uttaranchal	High	High	High
West Bengal	High	High	Data not available

SOURCE TERI Assessment

While sales have been increasing at a high growth rate in all the 9 states, the growth in number of consumers and connected load show a mixed trend.

Table 1.8 gives the trend in connected load per consumer and consumption per consumer (FY 2005-06).

Table 1.8: Trend in connected load per consumer and consumption per consumer

S.No.	States	Connected (Sanctioned) load per consumer kW / consumer	Consumption per consumer(FY 2005-06) kWh/consumer
1	Andhra Pradesh	1.56 (Constant)	2303
2	Assam	1.89 (Declining trend)	1764
3	Delhi	3.14 (Increasing trend)	4561
4	Jharkhand	1.62 (Increasing trend)	3569
5	Kerala*	1.32 (Decreasing trend)	1203
7	Madhya Pradesh	1.38 (Slight increase)	2692
6	Maharashtra*	2.19 (Increasing trend)	4042
8	Uttaranchal	1.94 (Increasing trend)	2924
9	West Bengal	1.59*	3173

SOURCE TERI estimate

*Trend not available

Table 1.9 gives the load factor for various consumer categories for the 9 states under study.

Table 1.9: Load factor for various consumer categories

S.No.	States	Domestic	Commercial	Industrial	Agriculture
1	Andhra Pradesh	10.72%	14.09%	18.08%	19.10%
2	Assam	8.51%	9.53%	10.36%	NA
3	Delhi	11.13%	13.22%	39.63%	18.83%
4	Jharkhand	27.54%	8.18%	24.21%	13.47%
5	Kerala	7.85%	8.06%	12.40%	NA
6	Maharashtra	10.39%	13.54%	19.47%	15.73%
7	Madhya Pradesh	21.57%	13.78%	29.51%	18.86%
8	Uttaranchal	12.33%	21.51%	33.41%	17.91%
9	West Bengal	8.24%	14.07%	26.69%	19.61%

SOURCE TERI estimates

The above tables highlight the fact that the average connected load per consumer in almost all states is low. In states like Delhi, where concerted efforts are being made to record the actual connected load of consumers, the connected load per consumer is highest at 3.14 kW and is showing an increasing trend over the period FY 2003-04 to FY 2005-06. Further analysis shows that the connected load per consumer for domestic consumers is also low in all states. For example, Madhya Pradesh has the average domestic load as 0.44 kW. There is wide variation in the consumer category wise load factor across states. For example, in domestic category it varied from 8.5% to 27%.

In most states, load factor is also very low. One of the reasons for this is the low level of sanctioned load. This needs to be looked at by the SERCs and the utilities on an urgent basis and steps must be taken to ensure that the actual connected load of each consumer is recorded. This will not only help in improving the

revenue position of the utilities, but also better system planning and demand estimation by them.

Table 1.10 and Table 1.11 give details of the categories that contributed highest in sales and revenue in FY 2005-06 in each of the 9 states.

Table 1.10: Categories contributing highest in sales

S.No.	States	Category contributing highest in sales	% contribution
1	Andhra Pradesh	Agriculture	33
2	Assam	Domestic	36
3	Delhi	Domestic	51
4	Jharkhand	HT Industry	43
5	Kerala*	Domestic	45
7	Madhya Pradesh	Industry	38
6	Maharashtra*	Industry	45
8	Uttaranchal	Domestic	36
9	West Bengal	Domestic	86

*Based on actuals

SOURCE TERI estimates

Table 1.11: Categories contributing highest in revenue

S.No.	States	Category contributing highest in revenue	% contribution
1	Andhra Pradesh	HT Industry	51
2	Assam	Domestic	29
3	Delhi	Commercial	38
4	Jharkhand	HT Industry	54
5	Kerala*	HT & EHT Industry	40
7	Madhya Pradesh	Industry	50
6	Maharashtra*	Industry	48
8	Uttaranchal	Industry	36
9	West Bengal	Industry	42

SOURCE TERI estimates

The above tables show that though in many states domestic category contributes maximum to sales, the highest contribution to revenue is of the industrial consumers (except in Assam and Delhi). This highlights the need for the SERCs and utilities to recognise the significance of industrial consumers in their sales mix. They should also ensure that tariff rationalisation reduces cross subsidy in existing tariff structure and to ensure good quality and reliable supply of power to this category so that they do not move towards captive sources of power generation which is showing an increasing trend in the country.

Rural electrification

Table 1.12 gives the status of rural electrification across 9 states.

Table 1.12: Status of rural electrification across 9 states under study

State	Villages to be electrified		Rural households to be electrified
	Number	%	%
Andhra Pradesh	48	0.18%	40.3%
Assam	6043	24%	83.5%
Delhi	-	-	14.5%
Jharkhand	21713	78%	90.00%
Kerala	Nil	Nil	34.5%
Madhya Pradesh	1643	3.15%	37.7%
Maharashtra	744	0%	34.5%
Uttaranchal	2630	18%	49.7%
West Bengal	6240	16.44%	79.7%

SOURCE Website of Ministry of Power

http://powermin.nic.in/JSP_SERVLETS/internal.jsp

The above table shows that substantial number of rural households still remain to be electrified in most states, the highest being in Jharkhand at 90%. The National Electricity Policy aims to achieve 100% access to Electricity for all households by 2012. To achieve this target alone may not be sufficient. The implications of this increase in terms of impact on technical and commercial losses and required tariff increase, consumer awareness, costs of supply also needs to be analysed by the utilities and the commissions. Given the large increase in coverage expected by 2012, the financial condition of the utilities will be severely strained in case tariffs do not keep pace with the cost of service,

Status of franchisee

Franchisees for local distribution in rural areas are presently functioning in Andhra Pradesh, Assam, Madhya Pradesh, Uttaranchal and West Bengal. This scheme serves the following main objectives:

- (i) To give better and reliable service to the rural domestic consumer
- (ii) Reduction of loss and prevention of pilferage
- (iii) Proper revenue billing and collection
- (iv) To ensure that power supply in rural area is a commercial proposition

Table 1.13 gives the Status of franchisee across 9 states.

Table 1.13: Status of franchisee across 9 states under study

S No	State	Expression of interest (No. of villages)	Franchisee in place (No. of villages)
1	Andhra Pradesh	Revenue input based and in place in 5 RGGVY and 3 other villages	8
2	Assam	Revenue-collection model, coverage 816 villages by individual entrepreneurs	816
3	Delhi*		-
4	Jharkhand	-	-
5	Kerala	-	-
6	Madhya Pradesh	Revenue collection based in 114 villages	114
7	Maharashtra*		-
8	Uttaranchal	Revenue collection based model in operation by Self Help Groups (Women participation) engaged in 5321 villages	5321
9	West Bengal	Revenue-Collect ion base model , coverage 816 villages by individual entrepreneurs	1713

*Distribution already privatised

** Bhiwandi in urban area is a franchisee area given to Torrent Company Ltd.

SOURCE Website of Ministry of Power

<http://powermin.nic.in/bharatnirman/Franchisee%20System%20in%20States.pdf>

<accessed in December 2006>

While states like Assam, West Bengal and Uttaranchal have successfully implemented the franchisee scheme, there is a need for other states with substantial rural population like Jharkhand to forward in this regard.

Status of metering

Table 1.14 gives the status of metering in the 9 states.

Table 1.14 : Metering Status across 9 states under the study

S No.	State	11 kV feeders			Distribution transformer			Consumers metering (Lakhs)		
		Numbers	Metered	%	Numbers	Metered	%	Numbers	Metered	%
1	Andhra Pradesh	9239	8674	94	351751	38729	11	157.46	150.47	96
2	Assam	709	709	100	21980	1528	7	12.74	12.09	95
3	Delhi	1850	1850	100	8000	3500	44	26.65	26.65	100
4	Jharkhand	461	396	86	16500	15000	91	6.53	4.90	75
5	Kerala	1334	1334	100	35442	5506	16	77.99	77.99	100
6	Madhya Pradesh	5660	5660	100	160000	3000	2	64.92	46.50	72
7	Maharashtra (MSEB)	6148	6148	100	215241	52923	25	135.32	118.12	87
8	Uttaranchal	1106	1106	100	27681	9360	34	10.60	10.04	95
9	West Bengal	2347	2347	100	53420	13500	25	57.31	56.70	99

SOURCE: http://www.apdrp.com/apdrp/projects/pdf/Metering_status.pdf <accessed in December 2006>

The level of Distribution Transformer metering still remains low in most states. It is the highest in Jharkhand at 91% and lowest in Assam at 7%. Despite this, losses in Jharkhand have been increasing. Therefore, metering alone does not ensure efficiency. Meters have to be read and data used to analyse consumption trends. Progress has been made as far as consumer metering is concerned with Delhi and Kerala

achieving 100% levels and West Bengal at 99%. Andhra Pradesh, Assam and Uttaranchal have 96% and 95% consumer metering respectively. States with low consumer metering include Jharkhand (75%), Madhya Pradesh (72%) and Maharashtra (86%). In many of the states with high level of unmetered consumers, T&D losses are being masked as unmetered sales especially in agricultural consumption.

Even though the data obtained from MoP states that the actual level of metering in the state is high; the actual status is much different. Box 1.1 gives the findings of study undertaken by IIT Roorkee on metering and billing irregularities in the UPCL system.

Box 1.1: Findings of study undertaken by IIT Roorkee on metering and billing irregularities in the UPCL system

Major findings of a study undertaken by IIT Roorkee (using month wise division wise data for April 2005 to June 2006) for UERC on metering and billing irregularities in the UPCL system are given below:

- About half of the consumers have been billed on actual consumption with remaining consumers billed on provisional/normative consumption
- No attempt has been made by UPCL to improve the situation with the number of defective meters remaining more or less same during the time period of the study
- Large number of consumers (about 12%) including subsidizing categories (non domestic, industrial) have no meters (fictitious meter numbers) and are billed on assumed consumption. Provisional billing on continuous basis result in serious financial repercussions for consumers as well as for licensee
- Bills are delivered late not as an exception but as a practice and late payment surcharge levied without any fault of consumer
- UPCL has allowed huge arrears to accumulate for years and has continued to supply to such installations
- UPCL's database has many inconsistencies and apparent errors

Source: "Irregularities in UPCL's billing system – Report on studies conducted by IIT Roorkee", Presentation at the meeting of the Board of Director of UPCL by IIT Roorkee on 13th February 2007 in Dehradun

T&D losses, collection efficiency and AT&C losses

Table 1.15 gives the trend in efficiency parameters of T&D loss, Collection efficiency and AT&C loss in the 9 states under study. The table shows that there has been some improvement in actual T&D loss reduction, though, it is not very significant in states like Assam and Madhya Pradesh. Analysis also reveals that though most utilities have been unable to meet targets set by the SERCs for loss reduction. AT&C loss level has deteriorated in states of Jharkhand and Uttaranchal.

Table 1.15: Trend in efficiency parameters of T&D loss, Collection efficiency and AT&C loss

S.No.	States	T&D loss	Collection efficiency	AT&C loss
1	Andhra Pradesh	Improvement	Improvement	Improvement
2	Assam	Insignificant improvement	Improvement	Marginal improvement
3	Delhi	Improvement	Improvement	Improvement
4	Jharkhand	Increasing	NA	Deterioration
5	Kerala	Improvement	Deterioration***	Marginal improvement
6	Madhya Pradesh (Based on actual data till 2004-05)	Insignificant	Improvement	Marginal improvement except for MP Madhya KVVCL
7	Maharashtra	Improvement	Constant	Improvement
8	Uttaranchal	Improvement	Decreasing	Deteriorating
9	West Bengal	Improvement	Increasing	Improvement

SOURCE TERI assessment

* Based on FY 2004-05 over FY 2003-04

Table 1.16 gives the level of T&D loss, collection efficiency and AT&C loss in the 9 states.

Table 1.16: Level of T&D loss, collection efficiency and AT&C loss in the 9 states

S.No.	States	T&D loss	Collection efficiency	AT&C loss
1		FY 2005-06 (Actual)	FY 2005-06 (Actual)	FY 2004-05 (Actual)
2	Andhra Pradesh	21.40%	100%	NA
3	Assam	35.67%	NA	NA
4	Delhi*	NA	NA	35.22%
5	Jharkhand	47%	NA	69.23%
6	Kerala	24.84	92.19%**	27.44***
7	Madhya Pradesh (Based on actual data till 2004-05)	43.08%****	88.95%	NA
8	Maharashtra	33.26%	NA	NA
9	Uttaranchal	31.30%	70.44%	42.85%
	West Bengal	24%	NA	35.66%

* The Tariff order now reports only AT&C losses as the bids for privatisation were based on AT&C loss reduction target. The AT&C loss varies across the three companies

** FY 2004-05

*** FY 2003-04

**** FY 2004-05

The best performing state in loss reduction and better collection is Andhra Pradesh. Among private sector utilities, aided by constant public scrutiny, Delhi has performed quite well. West Bengal is also on the right track in meeting loss reduction target. However, Assam, Madhya Pradesh, Maharashtra, Jharkhand and Uttaranchal have performed disappointingly. In Jharkhand and Uttaranchal the performance of the utilities has in fact deteriorated.

An area of concern is that even after a decade of reforms, many states are still struggling to realistically estimate the system losses. This dilutes the significance of the targets set by SERCs and the subsequent steps undertaken by utilities to achieve them as the actual loss level is

not known. There is, thus, an urgent need to undertake loss estimation studies at the state level.

Power Purchase Cost

The per unit power purchase cost shows an increasing trend in most states. Table 1.17 shows that the most important and significant component of ARR is the expenditure incurred on power purchase and fuel costs (in case of own generation of unbundled utilities). In this context, the initiatives of some states and the Central Government in encouraging tariff-bid based generating plants is a welcome step.

Table 1.17: Contribution of power purchase and fuel costs in ARR

States	Power purchase and fuel cost as % of ARR
	FY 2005-06 (Approved)
Andhra Pradesh	80.13%
Assam	51.86%
Delhi	75.61%
Jharkhand	60.66%
Kerala	44.05%
Madhya Pradesh*	60.77%
Maharashtra	63.65%
Uttaranchal	67.67%
West Bengal	71.49%

* Based on petition for FY 2005-06

SOURCE TERI estimate

Power purchase and own generation costs have the highest share in total ARR for all states. It is as high as 80% in Andhra Pradesh. This highlights the need for SERCs to lay emphasis on analysing prudence of power purchase costs and promote better fuel stock management, improving generation efficiency of power plants, and reducing loss levels.

Employee Costs (EC)

Table 1.18 gives the status on the various parameters of employee productivity (employee costs as a percentage of ARR, employee costs per unit of sale, number of employees per 1000 consumers and revenue per employee) in the 9 states for FY 2005-06.

Table 1.18: Productivity in employee costs

S.No.	States	EC as a % of ARR %	EC per unit of sale Rs/kWh	No of employees/ 1000 consumers	Revenue per employee Rs Crore
1	Andhra Pradesh	7.06%	0.21	3.61	0.14
2	Assam	29.00%	1.47	12.45	0.06
3	Delhi	8.09%	0.32	5.63	0.35
4	Jharkhand*	8.70%	0.59	6.44	0.16
5	Kerala	25.00%	0.86	3.08	0.13
6	Madhya Pradesh**	14.83%	0.61	2.37	0.12
7	Maharashtra	12.72%	0.42	NA	NA
8	Uttaranchal	15.19%	0.37	NA	NA
9	West Bengal	9.00%	0.36	4.8	0.18

*Based on revised estimates submitted by JSEB for FY 2005-06, ** Till FY 2004-05

Note: Andhra Pradesh and Delhi are for distribution segments; Assam, Jharkhand, Kerala, Madhya Pradesh and West Bengal for generation, transmission and distribution combined and Uttaranchal for transmission and distribution combined

SOURCE TERI estimates

There is a very wide variation in employee costs per unit of sale in the states. Andhra Pradesh leads with only Rs 0.21/kWh while employee cost in Assam is as high as Rs 1.47/kWh. Consequently, revenue per employee in Assam is the lowest.

Table 1.19 gives the trend in employee productivity using the above parameters.

Table 1.19: Trend in productivity in employee costs

S.No.	States	EC as a % of ARR %	EC per unit of sale Rs/kWh	No of employees/ 1000 consumers	Revenue per employee Rs Crore
1	Andhra Pradesh	Constant	Constant	Decreasing	Increasing
2	Assam	Decreasing	Increasing	Decreasing	Increasing
3	Delhi	Decreasing	Decreasing	Decreasing	Increasing
4	Jharkhand	Decreasing	Decreasing	Decreasing	Increasing
5	Kerala	Increasing	Increasing	Decreasing	Decreasing
6	Madhya Pradesh	Decreasing	Decreasing	Decreasing	Increasing
7	Maharashtra	Increasing	Constant	Decreasing**	Increasing**
8	Uttaranchal	Decreasing	Decreasing	N.A.	N.A.
9	West Bengal	Decreasing	Decreasing	Decreasing	Increasing

* Based on revised estimates submitted by JSEB

** Till FY 2004-05

SOURCE TERI assessment

As observed from the above, some states have shown improvement in the employee productivity viz. Delhi, West Bengal, Madhya Pradesh, Jharkhand with all the above parameters showing an improvement. Other states like Assam and Kerala need to improve further in this regard. The decline in employee costs is also the result of freezing of fresh recruitment in most states. This has resulted in outsourcing of services which are often obtained at a lower cost. This reinforces the need to

unbundle wires and services and encourage competition in the provision of services like metering, billing and collection.

Administrative and general expenses (A&G expenses)

Table 1.20 gives the status on parameters of productivity of A&G expenses in the 9 states for FY 2005-06.

Table 1.20: Productivity in A&G expenses

S.No	States	A&G as a % of ARR %	A&G per unit of sale Paise/kWh
1	Andhra Pradesh	1.34%	3.9
2	Assam	1.32%	6.75
3	Delhi	1.34%	5.38
4	Jharkhand*	2.00%	13.4
5	Kerala	2.70%	9.2
6	Madhya Pradesh**	1.56%	6.39
7	Maharashtra	0.93%	3.1
8	Uttaranchal	1.74%	4.0
9	West Bengal	1.50%	5.8

*Based on revised estimates submitted by JSEB for FY 2005-06, ** Till FY 2004-05

Note: Andhra Pradesh and Delhi are for distribution segments; Assam, Jharkhand, Kerala, Madhya Pradesh and West Bengal for generation, transmission and distribution combined and Uttaranchal for transmission and distribution combined

SOURCE TERI compilation

Table 1.21 gives the trend in parameters of productivity of A&G expenses.

Table 1.21: Trend in productivity in A&G expenses

S.No	States	A&G as a % of ARR	A&G per unit of sale
1	Andhra Pradesh	Constant	Marginal decrease
2	Assam	Increasing	Marginal decrease
3	Delhi	Increasing	Increasing
4	Jharkhand*	Marginal Decrease	Increasing
5	Kerala	Increasing	Increasing
6	Madhya Pradesh**	Increasing	Increasing
7	Maharashtra	Decreasing	Decreasing
8	Uttaranchal	Increasing	Decreasing
9	West Bengal	Decreasing	Decreasing

*Based on revised estimates submitted by JSEB for FY 2005-06

** Till FY 2004-05

SOURCE TERI compilation

As observed from the above, only Maharashtra and West Bengal show an improvement on both the parameters of A&G productivity. Further, in most of the states the level of A&G expenses as a percentage of ARR ranges between 1 to 3%.

Repair & Maintenance expenses

Table 1.22 gives the details of Repair & Maintenance Expenses as % of GFA.

Table 1.22: Trend in productivity in Repair & Maintenance expenses

S.No.	States	R&M as a % of GFA Trend	R&M as a % of GFA %
1	Andhra Pradesh	Decreasing	2.20%
2	Assam	Increasing	1.29%
3	Delhi	Increasing	4.09%
4	Jharkhand*	Increasing	2.86%*
5	Kerala	Marginal Decrease	1.17%
6	Madhya Pradesh**	Increasing	2.42%
7	Maharashtra	Marginal Increase	2.60%
8	Uttaranchal	Increasing	4.68%
9	West Bengal	Decreasing	1.80%

*Based on revised estimates submitted by JSEB for FY 2005-06

** Till FY 2004-05

SOURCE TERI estimates

R&M expenditure should be appropriately subjected to prudence check to clearly identify its impact in terms of improvement in system operation. This is important particularly in states like Jharkhand where although R&M expenses show an increasing trend, the losses are increasing and plant performance is deteriorating⁸.

Depreciation

Table 1.23 gives the approach adopted by various SERCs towards the provision of depreciation and the basis for the same.

Table 1.23: Approach adopted by SERCs towards depreciation

S.No.	States	Basis of providing depreciation
1	Andhra Pradesh	MoP Notification 1994
2	Assam	Linked to repayment portion of loan in the year
3	Delhi	SERC granter depreciation as per MoP notification of 1994. However, the rate of depreciation was challenge by the discoms. The matter remains pending with the Supreme Court
4	Jharkhand	MoP Notification 1994
5	Kerala	In accordance with KSERC regulations. Allowed on CERC norms
6	Madhya Pradesh	Norms issued under E(S) Act, 1948
7	Maharashtra	Based on actuals of past years
8	Uttaranchal	Allowed on the basis of CERC norms
9	West Bengal	As per provisions of Electricity Supply Act 1948, upto FY 2004-05 and as per WBERC Terms and Conditions of Tariff, 2005 in FY 2005-06

SOURCE TERI Compilation

⁸ JSEB reported a PLF of 11% and 13% for FY 2004-05 and FY 2005-06 respectively

In Maharashtra, the MERC approved depreciation at the rate of 6.59% of the opening gross block of assets for FY 2005-06 for MSEDCL. In Delhi, the Commission approved a depreciation rate of 3.75% (further details are given in Chapter 4 on Delhi) and in Andhra Pradesh this was 7.49%.

It is seen that different states have been following different approaches for provision of depreciation including that based on CERC norms and MoP notification. This fact was also noted in TERI's earlier study undertaken for FOIR in 2002.

Return

Table 1.24 gives the approach adopted by various SERCs towards the provision of return and the basis for the same.

Table 1.24: Approach adopted by SERCs towards provision of return

S. No	States	Basis of providing return
1	Andhra Pradesh	The Commission has considered a 16% return on net capital base and 0.50% on the approved loans taken to the Capital Base of licensees
2	Assam	Return not allowed by SERC due to poor performance of licensees in FY 2004-05, SERC did not allow return in FY 2005-06
3	Delhi	16% in accordance with Policy directions issued by GoNCTD as part of the reform package
4	Jharkhand	Return not provided as the Commission adjusted the same with the loss level reduction proposed by the petitioner
5	Kerala	14% of the equity base
6	Madhya Pradesh	Return on Net Fixed Assets @ 3%
7	Maharashtra	4.5% of Net Fixed Assets in accordance with E(S) Act and gazette notification of the Government of Maharashtra
8	Uttaranchal	Return not provided as assets financed totally out of grants and loans
9	West Bengal	Till FY 2004-05 - Adjustment for disallowance of capital cost FY 2005-06: Reasonable return on equity capital of the Board @ 13.25% (SBI PLR+3%) in FY 2005-06

SOURCE TERI Compilation

Although a statutory requirement, the Commissions in Assam, Jharkhand and Uttaranchal have not allowed any return in their orders. In Uttaranchal, the reason given was that the assets are totally financed out of grants and loans. In Jharkhand, the Commission ordered it to be adjusted with the loss level reduction proposed by the petitioner (the Commission approved a lower level of loss reduction target than proposed). In Assam, the reason given by the AERC was the poor performance of licensees. Return may be withheld only under exceptional circumstances. Unless the companies get a fair return on investment it would not be possible for them to undertake adequate fresh investments. Even when Electricity Boards were financed by government loans, they were expected to earn a return of 3% on net

fixed assets. Therefore, denying them any rate of return is to negate commercial principles of corporate governance and adversely impact the long-term viability of distribution companies.

Operating expenditure (OE)

The operating expenditure⁹ of the distribution licensees ranges between 19-25% as proportion of gross ARR in distribution, while for states where unbundling has not yet taken place, it ranges between 28-56%. This reiterates that while prudency check of operating expenses is an important component of tariff regulation, SERCs should increasingly focus on improving generation efficiency and reducing system losses. Table 1.25, Table 1.36 and Table 1.37 give the proportion of various components of operating expenditure in gross total operating expenditure.

Table 1.25: Employee costs, A&G expenses, R&M expense, interest costs and depreciation as proportion of total operating expenditure for Andhra Pradesh and Delhi

S.No.	States	Distribution segment only	Employee Costs as a % of OE	A&G expense as a % of OE	R&M expense as % of OE	Interest costs as a % of OE	Depreciation as a % of OE
1	Andhra Pradesh		34.88%	6.66%	7.04%	22.24%	21.62%
2	Delhi		34.71%	5.33%	13.87%	10.15%	13.12%

SOURCE TERI estimates

Table 1.26: Employee costs, A&G expenses, R&M expense, interest costs and depreciation as proportion of total operating expenditure for Assam, Jharkhand, Kerala, Madhya Pradesh and West Bengal

S.No.	States	Generation, Transmission and distribution segments	Employee costs as a % of OE	A&G expense as a % of OE	R&M expense as % of OE	Interest costs as a % of OE	Depreciation as a % of OE
1	Assam		60.24%	2.75%	5.29%	15.08%	6.53%*
2	Jharkhand		22.09%	4.72%	5.54%	56.75%	9.32%
3	Kerala		44.90%	4.81%	4.52%	30.97%	12.51%
4	Madhya Pradesh		37.79%	3.98%	12.46%	18.16%	20.71%
5	Maharashtra		33.52%	2.46%	11.66%	11.61%	25.42%
6	West Bengal		30.40%	4.92%	8.38%	14.28%	28.15%

SOURCE TERI estimates

* Depreciation to the extent of loan repayment was approved

Table 1.27: Employee costs, A&G expenses, R&M expense, interest costs and depreciation as proportion of total operating expenditure for Uttaranchal

S.No.	States	Transmission and distribution segments	Employee costs as a % of OE	A&G expense as a % of OE	R&M expense as % of OE	Interest costs as a % of OE	Depreciation as a % of OE
1	Uttaranchal		42.47%	4.86%	13.16%	24.64%	14.88%

SOURCE TERI estimates

⁹ All expenditure except power purchase and fuel costs

The above tables highlight that employee costs and interest costs are the major contributors to operating expenditure. Interest costs in Jharkhand and Kerala is very high and this should be rectified when the financial restructuring takes place in these states.

Further, wide variation in depreciation and R&M expenses deserves attention. In Delhi and Assam, depreciation expenses sought for approval in the ARR were scaled down substantially.

Capital expenditure

Capital expenditure is the life line of utilities as it directly impacts on the quality and reliability of power supply.

Study of the tariff orders issued by various SERCs reveals that in many orders, complete details of the capital expenditure approved and actually incurred by the utilities have not been provided, thereby limiting detailed analysis of the same in this report.

However, some SERCs like DERC have delved into this component in great detail. The Delhi example also highlights that adequate capital expenditure is essential for the utilities to improve quality and reliability of power supply to consumers. The actual capex in FY 2005-06 by the three licensees in Delhi was Rs 1225 Crore (96% of approved amount), the subsequent improvement in quality of supply is visible in the state.

Commercial loss

The total commercial losses (without subsidy) of power sector utilities in India increased from Rs 19722 Crore in FY 2003-04 to Rs 222129 Crore in FY 2004-05¹⁰. Table 1.28 gives the movement in this loss level for the 9 states under study over this two year period.

Table 1.28: State wise commercial loss (w/o Subsidy) of power utilities

Region/State	FY 2003-04	FY 2004-05
Andhra Pradesh	(1579)	(1194)
Assam	(656)	(1081)
Delhi	(1781)	(812)
Jharkhand	(730)	(1183)
Kerala	(916)	(239)
Madhya Pradesh	(667)	(764)
Maharashtra	(549)	(804)
Uttaranchal	(40)	(179)
West Bengal	(296)	(275)

SOURCE Report on Restructuring of APDRP, Ministry of Power, Gol, October 2006 (P Abraham, Chairman, Task Force & Former Secretary, MoP, Gol)¹¹

¹⁰ As per Economic Survey 2006-07, the commercial loss (excluding subsidy) for FY 2005-06 (provisional) is Rs. 21110 Crore and FY 2006-07 (RE) is Rs. 26150 Crore.

¹¹ The loss figures are not based on audited accounts in all states. Accounts may show considerable variation due to adjustments.

The above table shows that in five out of the nine states, namely, Assam, Jharkhand, Madhya Pradesh, Maharashtra and Uttaranchal, the commercial losses have increased. The commercial losses show a declining trend in the rest of the four states viz. Andhra Pradesh, Delhi, Kerala¹² and West Bengal.

Provision of subsidy by the State Government

Table 1.29 gives the amount of subsidy that was to be given by the State Government and the subsidy actually released in various years.

Table 1.29: Estimated and released subsidy by State Governments

States	Estimated subsidy			Subsidy released		
	FY 2003-04	FY 2004-05	FY 2005-06	FY 2003-04	FY 2004-05	FY 2005-06
Andhra Pradesh*	1513.50	1303	1599.50	1513.50	1303	1599.50
Assam	110	76	49	0.04	69.69	NA
Delhi	No subsidy to distribution companies except during roll-back of tariff for domestic and agricultural consumers FY 2005-06 and FY 2006-07					
Jharkhand	40	Accounts of JSEB do not mention any subsidy on account of tariffs		40	Accounts of JSEB do not mention any subsidy on account of tariffs	
Kerala	375	96	51.31	556.46	0	0
Madhya Pradesh	1055	784	667	1049	778	0
Maharashtra	1100.83	1574.3	1563.76	1100.83	1553.52	1562.48
Uttaranchal	No subsidy provision					
West Bengal	No mention of subsidy in the petitions and orders. Further details are given in Chapter 10 of this report					

*Subsidy is administered on a monthly basis. As per the APERC, it is released on time

Table 1.30 gives the status of subsidy provision and disbursement by the State Government.

Table 1.30: Provision of subsidy by the State Government and its disbursement across 9 states under study

States	Provision	Disbursement (FY 2003-04 to FY 2005-06)
Andhra Pradesh	Yes	On time
Assam	Yes (Till FY 2004-05)	On time
Delhi	Yes	On time
Jharkhand	Yes	On time
Kerala	Yes	Not paid on time
Madhya Pradesh	Yes	On time (post 2003-04)
Maharashtra	Yes	On time
Uttaranchal	No	Not applicable
West Bengal	Yes	On time

SOURCE TERI compilation

¹² In Kerala, the Regulatory Commission had focussed primarily on the improving the financial health of the State Electricity Board.

The tables above highlight the dependence of the sector on government subsidy and its inability to self sustain its growth. 8 out of 9 states have received subsidy in one of the segments viz. distribution, transmission and generation. The above tables also show that in most states, the State Governments have now started disbursing the subsidy to the utilities on time. However, this still needs to be improved further.

Tariff structures

Tariff rebalancing has been undertaken by all states through their tariff orders except Kerala where the Commission did not undertake any rationalisation. Most states have undertaken rationalisation of tariff categories and slabs through reduction in their numbers and mergers of slabs and categories. The attempt has been to make the tariff structure simpler and easier to understand. At the same time, new initiatives like Time of Day tariff (ToD tariff), seasonal tariff, load factor rebates, power factor rebates and surcharge etc have also been introduced. Table 1.31 gives the status on Time of Day tariff and special tariff for promotion of renewables introduced by the Commissions through their tariff orders.

Table 1.31: Status on Time of day tariff and special tariff for promotion of renewables introduced by the Commissions through their tariff orders

S.No.	States	Time of Day/Time of use Tariff		Special tariff for promotion of renewable
		Applicable	Category	Applicable
1	Andhra Pradesh	X	NA	X
2	Assam	√	HT industry; Tea, Coffee & Rubber; Oil & Coal	√
3	Delhi	X	NA	X
4	Jharkhand	√	HT & EHT categories	X
5	Kerala	√	HT & EHT categories	X
6	Maharashtra	√	HT industry; HT Seasonal Industry; Water works; General Motive Power	X
7	Madhya Pradesh	√	All HT consumers	X
8	Uttaranchal	√	Industrial and Commercial	√
9	West Bengal	√	Industrial; HT commercial & HT Public Utilities Services (Optional)	X

SOURCE TERI compilation

The special tariff for use of renewables is part of tariff structure in Assam and Uttaranchal. In Assam, the Commission introduced a monthly rebate of Rs.40 for all consumers who have installed solar water heating systems for meeting their hot water requirements in order to encourage consumers to switch over to solar water heating system. In Uttaranchal, the Commission introduced a monthly rebate of Rs. 50 for all consumers who have installed solar water heating system in order to reduce peak demand during the winter months.

In Madhya Pradesh, the consumers made submissions during the public hearing in FY 2004-05 to provide incentives in tariff to those customers who had adopted solarizers and solar water heaters which were electricity saving device. The licensee submitted that such promotions were policy issues and within purview of GoMP. The Commission, though, was in agreement with the proposal for encouraging use of non conventional sources of energy and promoting energy saving equipment did not introduce any such rebate stating that it will consider any proposal by the Board for incentives on use of solarizers in future.

All the 9 states except Andhra Pradesh and Delhi have ToD tariff as part of the tariff structure and in most states it is applicable for HT industrial consumers. In West Bengal, it has been made optional for HT commercial consumers and Public Utility Services. However, the essential requirement at the state level is to undertake a study to estimate the benefit that has accrued by introducing ToD tariff for various categories of consumers in terms of shift in demand and subsequent savings in peak time power purchase. A number of Commissions including Kerala and Delhi are contemplating extending TOD tariffs to other categories like commercial and domestic. It is imperative to conduct studies on the feasibility (including requirement of metering infrastructure) and potential savings that will accrue before moving forward on this. Delhi is planning to undertake pilot projects to introduce ToD for the domestic category of consumers.

Also important is to undertake consumer awareness programmes on the concept and benefits of such a tariff. It is worth mentioning here the initiative taken by the WBERC. WBERC has been interacting with the consumers of the categories for which ToD has been made optional. During these interactions, it explains to the consumers the features of ToD metering system and encourages them to adopt the same.

Some states have also introduced special tariffs depending upon the geographical conditions and socio-economic conditions existing in the state. States including Assam, Madhya Pradesh, Uttaranchal and West Bengal have a 'life line slabs' for domestic consumers for the poorest of the poor consumers. Assam and Uttaranchal have seasonal tariffs for industrial consumers. Uttaranchal has provided special concession for consumers in snowbound areas. All domestic consumers and small non-domestic consumers with load upto 1 kW in snow bound areas are exempt from payment of minimum charges. These consumers

are also given tariff as under the sub-category of BPL consumers with upto 1 kW load and 30 units/month consumption¹³.

Average tariff

Table 1.32 demonstrates that despite annual tariff fixation exercise by the commission, the financial health of most state utilities is not improving.

Table 1.32: Details of financial health of all utilities in India

	FY 2000-01	FY 2001-02	FY 2002-03	FY 2003-04	FY 2004-05
Energy sold/ Energy available	67	66	66	67	68
Loss or sale of electricity (Rs. Crore)	297600	30427	36203	26983	27729
Average cost of Supply (paise/unit)	334.53	352.60	354.46	361.00	359.99
Avg. Tariff (paise/unit.)	229.89	243.73	264.11	274.29	276.54

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SOURCE www.infraline.com

The fact that the proportion of energy sold to energy available is almost constant clearly shows that regulatory oversight has not made a major difference in reducing losses. It further indicates the necessity of continuation of the investments by Government of India and Financial Institutions to take reforms forward in the sector.

In many states, cross subsidy is much higher than state provision of subsidy. For example, in Andhra Pradesh in FY 2006-07 cross subsidy amounts to Rs 480 Crore as compared to state subsidy of Rs 370 Crore. This highlights that even though attempts have been made to rationalise tariffs and reduce the extent of cross subsidy in tariff, much still remains to be done. Table 1.33 gives the average tariff across various consumer categories in FY 2005-06 across 9 states under study.

Table 1.33: Average tariff across various consumer categories

S. No.	States	Average tariff (Rs./kWh)			
		Domestic	Commercial	Industry	Agriculture
1	Andhra Pradesh	2.4	5.7	4.41 (HT) 4.03 (LT)	1.69 (HT) 0.053 (LT)
2	Assam	3.57	5.39	4.19	NA
3	Delhi	2.8	6.12	5.38	1.56
4	Jharkhand*	1.49	4.52	3.98 to 5.09	0.58
5	Kerala	1.77	3.90 (HT) 6.73 (LT)	3.97 (HT) 4.03 (LT)	4.55 (HT) 0.92 (LT)
6	Madhya Pradesh	3.09	5.64	4.39	2.15

¹³ Concession available only to villages notified as snowbound/snow line villages by the concerned District Magistrate

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7	Maharashtra (2006-07)	3.08	4.4	2.92-3.17	1.44 (HT) 1.76 (LT)
8	Uttaranchal	1.93	3.21	3.03	1.52 (PTW)
9	West Bengal	2.67	4.45	4.08	1.50

* Figures pertain to tariff in FY 2003-04 as there has been no tariff revision after that.

SOURCE TERI estimates

Table 1.34 gives the overall average realisation and average cost for 9 states under study for FY 2004-05 (based on actuals).

Table 1.34: Overall average realisation and average costs in 9 states under study

S. No.	States	Overall average	Overall average
		realisation	cost
		Rs/kWh	Rs/kWh
1	Andhra Pradesh	2.33	3.00
2	Assam	4.45	5.18
3	Delhi*	3.97	3.51
4	Jharkhand	3.49	7.14
5	Kerala	3.19	4.02
6	Madhya Pradesh	2.94	4.12
7	Maharashtra	3.23	3.39
8	Uttaranchal**	3.59	3.93
9	West Bengal	3.05	3.46

*Approved figures

**Actual for FY 2003-04

SOURCE TERI estimates

The above tables show that average costs are substantially higher average realisation in all states.

Tariff increases should normally keep pace with increase in input prices adjusted for productivity improvements. However, tariff increases have fallen short of meeting the viability test. While estimating the expected revenue of utilities and fixing tariffs, regulators should not ignore viability considerations. If the utilities are not meeting the expected improvement levels, then the Commission should ensure that the subsidy levels are increased by the State Government. No Commission, even in states where loss levels are high has done this resulting in poor quality of supply.

During FY 2003-04 to FY 2005-06, the Wholesale Price Index (WPI-annual average) increased by 5.42% (CAGR) each year. Analysis of the states where tariff orders were issued by the SERCs in FY 2003-04 and FY 2005-06 shows that average tariffs as approved by the Commission have not increased commensurately. In fact, in Andhra Pradesh and Kerala, there has been a decline in overall average tariffs by 1.89% and 2.48% respectively. In Uttaranchal, the increase was 3.47%, much lower than the increase in WPI. In West Bengal, the increase in average

tariff from FY 2004-05 to FY 2005-06 was 2.40% while the WPI increased by 4.38%. In Assam, the increase in tariffs at 5.64% is higher than change in WPI from FY 2004-05 to FY 2005-06. In Delhi too, tariffs have increased over the WPI levels.

Cross subsidy

In the context of rationalisation of tariffs, it is imperative to evaluate as to what extent ERCs have been able to achieve reduction in cross subsidy. For this purpose, the following Convergence Index has been used. This index will measure the extent to which the average realization from each category converges towards the overall average realization.

$$CI = \sqrt{\{\sum[(ARc/OAr)-1]^2 (Fc / \sum Fc)\}}$$

Where

CI = Convergence Index

ARc = Average realization of each consumer category (Rs/kWh)

OAr = Overall average realization (Rs/kWh)

Fc = Revenue from each consumer category (Rs. Crores)

Any improvement in terms of tariff rationalisation gets reflected in a reduction in this index after a change in tariffs by the regulator. Hence the index captures the movement of the realisation from each category to the over all average realisation, i.e., to what extent each category pays the same tariff. If for all consumer categories, the average tariffs are equal, then the ratio of these two (ARc/OAr) will be 1 and hence the Convergence Index will become Zero. Such an index can give perverse findings if the HT tariffs are below the average cost and LT are above the average cost. Since this is not the case at present it can be expected that there will be no perverse findings reported. Ideally, the average realisation from each consumer category should be equal to the cost incurred in serving that category. Thus, if a voltage wise classification is used average tariff from each category should equal the cost at the respective voltage level. However, it has not been used for all the states in this study due to non availability of as data.

The trend in convergence index shows improvement in all states except in Delhi and Kerala as shown in Table 1.35. These are discussed in greater detail in the relevant chapters on these states.

Table 1.35 Trend in CI from FY 2003-04 to FY 2005-06

S. No.	States	Trend in CI
1	Andhra Pradesh	Improvement
2	Assam	Improvement
3	Delhi	Deterioration
4	Jharkhand***	Improvement
5	Kerala	Deterioration
7	Madhya Pradesh	Improvement
7	Maharashtra (2006-07)	Improvement
8	Uttaranchal	Improvement
9	West Bengal	Improvement

SOURCE TERI estimates

Out of the 9 states under study, TERI had analysed orders of 4 states, namely, Andhra Pradesh, Maharashtra, Madhya Pradesh, and Uttaranchal in study undertaken by it in 2002 for FOIR. An analysis of the trend in CI from FY 2000-01 to FY 2005-06 (FY 2006-07 in case of Maharashtra) for these 4 states shows that this improvement has been consistent during the entire period. However, the improvement was higher in the first few years of tariff rationalization.

Trading

As on 31st December, 2006, 22 inter state trading licenses have been issued by CERC. Table 1.36 gives the list of trading licenses issued.

Table 1.36 List of company/firms who have been granted licence for inter-state trading in electricity (as on 12th December, 2006)

S.No.	Name of applicant	Date of Issue of Licence/Status/Category
1	Lance Electric Utility Ltd.	F-Category
2	Vinergy International Private Ltd.	B-Category
3	Tata Power Trading Company Ltd.	F-Category
4	PTC India Ltd.	F-Category
5	DLF Ltd.	A-Category
6	Adani Enterprises Ltd.	F-Category
7	Reliance Energy Trading Ltd.	F-Category
8	NTPC Vidyut Vyapar Nigam Ltd.	F-Category
9	Chhattisgarh Electricity Company Ltd.	A-Category
10	MMTC Ltd.	C-Category
11	GMR Energy Ltd.	A-Category
12	Jindal Steel & Power Ltd.	A-Category
13	Karam Chand Thapar & Bros. (Coal Sales) Ltd.	A-Category
14	Subhash Kabini Power Corporation Ltd.	A-Category
15	Special Blasts Ltd.	A-Category
16	Maheshwary Ispat Ltd.	A-Category
17	Instinct Advertisement & Marketing Ltd.	A-Category

S.No.	Name of applicant	Date of Issue of Licence/Status/Category
18	Essar Electric Power Development Corporation Ltd.	C-Category
19	Suryachakra Power Corporation Ltd.	A-Category
20	JSW Power Trading Company Ltd.	F-Category
21	GEA Energy System (India) Ltd.	F-Category
22	Malaxmi Energy Trading Pvt. Ltd.	A-Category

SOURCE www.cercind.org (accessed in February 2007)

As on 31st March 2006, only 7 of the above 22 entities were undertaking trading. These 7 licensees traded a total volume of electricity of 14188 MU during FY 2005-06. Of the total volume, 58.90% was traded by PTC India Ltd followed by Adani Exports Ltd (21.00%), NTPC Vidyut Vyapar Nigam Ltd (11.58%), Tata Power Trading Company (4.75%), Reliance Energy Trading Ltd (3.40%), Subash Kabini Power Corporation Ltd (0.29%) and Lanco Electric Utility Ltd (0.08%). The volume of electricity traded by the licensees has increased from 11028 MU in FY 2003-04 to 14188 MU in FY 2005-06 registering a growth of 29%. For FY 2006-07; the trading volume is estimated to be 15000 MUs. The volume growth was 7% from 2003-04 to 2004-05 and 20% from 2004-05 to 2005-06. However, the volume of electricity traded as a percentage of the total electricity generation has increased from 1.98% in 2003-04 to 2.52% in 2005-06¹⁴.

Tables 1.37 and 1.38 give the details of the selling and buying entities along with the volume of electricity traded in FY 2005-06.

Table 1.37 Buying entities in FY 2005-06

S.No.	Name of the buying entity	Volume of electricity bought from Traders (MU)
1	MSEB/MSEDCL	3308.85
2	MPSEB	2387.74
3	TPCL	447.80
4	DTL	408.10
5	APPCC/APTRANSCO	175.35
6	ASSAM	155.11
7	WBSEB	106.92
8	UTC	60.40
9	CESC/CESE	59.68

SOURCE www.infraline.com (accessed in February 2007)

¹⁴ www.infraline.com. Accessed during February 2007

Table 1.38 Selling entities in FY 2005-06

S.No.	Name of the selling entity	Volume of electricity sold to traders (MU)
1	WBSEB	3063.74
2	APPCC/APTRANSCO	1199.93
3	JTPCL	828.20
4	KSEB/KPCL	771.73
5	CESC/CESE (DL)	374.19
6	ASEB	256.30
7	MPSEB	141.23
8	UPCL	96.40
9	Delhi Transco Ltd	48.00

SOURCE www.infraline.com (accessed in February 2007)

Trading through UI has witnessed an increasing trend over the last few years. However, it is not known whether trading through UI is taking place on account of true surplus in the state or is just a source of earning additional revenue to improve the balance sheets of the utilities. Therefore, there is a growing concern that some states maybe undertaking load shedding to achieve the latter. Such a situation needs to be discouraged as it not only affects the general consumers but also adversely impacts the economic activity in the state. However, any conclusive statement in this regard requires a separate state specific analysis.

Electricity duty

Table 1.39 shows the electricity duty collected by the utilities in FY 2005-06 and the subsidy received from the state governments.

Table 1.39 Electricity duty collected

S.No	State	Electricity duty collected	Subsidy received	Electricity duty collected as a percentage of subsidy
1 *	Andhra Pradesh	124*	1599	8
2 S	Assam	14.33	49	29
3 O	Delhi	218	138**	158
4 U	Jharkhand	NA	40	
5 R	Kerala	58.6	51.31***	114
6 C	Madhya Pradesh	285*	667	43
7 E	Maharashtra	1033*	1564	66
8 W	Uttaranchal*	NA	0	
9 W	West Bengal	197.5	19.96	989

www.infraline.com

** Provided to Transco (does not include subsidy provided on account of roll back of tariff)

***Remains unpaid

It is evident from the above table that electricity duty is a source of partial funding for subsidy commitments of state governments and varies widely from state to state. The Power Finance Corporation (PFC) Ltd. has also carried out an analysis of the electricity duty collected and paid to state governments by the utilities and the relationship it bears to the subsidy support received from the state governments. PFC analysis indicates that electricity duty levied by state governments, across various consumer segments turns out to be a partial source for funding the subsidy commitments of the state governments, but there is no direct relationship in between the Electricity Duty & Subsidy¹⁵. PFC also observed that in many states the electricity duty collected by the state governments as a percentage of the subsidy payments to the utilities ranges from 8% to as high as 59%. While in Haryana and Andhra Pradesh, the percentage of electricity duty collection is less than 10%, Punjab and Uttar Pradesh fall in the range of 10% to 15%, Karnataka and Tamil Nadu, in the range of 20% to 30% and the states of Madhya Pradesh, Rajasthan & Gujarat fall in the range of more than 30% with Gujarat being the highest at 59%. In states like Assam and Meghalaya, no subsidy has been released; however the governments have collected electricity duty.

Further, in many states, no duty is levied on subsidized categories such as agriculture.

Recent developments in regulatory practice

Multi-year tariff (MYT)

The aim of the regulatory reform process is to provide utilities with incentives to improve their investment and operating efficiency and to ensure that consumers benefit from the efficiency gains. International experience of regulatory reforms in the electricity sector has indicated an evolution of incentive based regulation as an alternative to the traditional rate-of-return (ROR) or cost-of-service (COS) regulation of utilities and regulators have adopted a variety of approaches to incentive regulation. Incentive regulation schemes commonly use benchmarking as a tool, which is broadly defined as the *comparison of some measure of actual performance against a reference or benchmark performance.*

¹⁵ This analysis was carried out for 28 utilities out of 39 power utilities selling directly to consumers for the year 2004-05 for which the data is available. The Power Departments of 9 States were excluded as no subsidy element is involved.

While examining the process of setting retail tariff in India, the present system followed by the State Electricity Regulatory Commissions (SERCs) is an annual tariff determination exercise that is based on the ROR regulatory principles. According to the present system of tariff determination, the utility is required to submit an annual filing of expected revenue from charges and the Commission has to either approve the tariff proposed by the licensee or provide an alternative tariff.

The broad objectives of the MYT regulation are summarized below:

- **Cost reduction:** This is the most important objective of MYT regulations. In theory, increasing incentives to cut costs is one of the easier tasks to build into the MYT framework. However, meeting this goal often conflicts with other objectives, such as sharing the benefits (cost savings) with consumers.
- **Innovation:** Innovation in the context of an MYT framework can mean, (a) encouraging the utility to find effective ways to cut costs or (b) designing incentives to develop new and creative service offerings.
- **Improving customer service and satisfaction:** this generally requires the MYT principles to be accompanied with a reward/ penalty provision to encourage compliance.
- **Risk allocation:** MYT principles determine whether the utility or the consumer can bear particular risks most efficiently and evaluate how investment decisions get influenced by various risk allocations.
- **Other objectives:** From the point of view of the various stakeholders who are involved in the MYT framework, some of the other goals that MYT regulation seeks to address are:
 - Simplification of the regulatory process – regulator lays down tariff methodologies for a defined future time period that are simple, unambiguous and understood by all stakeholders who are then able to plan accordingly.
 - Efficiency improvement and risk mitigation – design of incentives, as a part of the MYT exercise will help promote efficiency. Further, MYT principles can help licensees mitigate risks in electricity supply on account of substantial risks that have to borne due to varying consumer mix, which is mostly beyond their control.
 - Greater cost effective supply of electricity for consumers.

A key question that needs to be addressed while designing the MYT framework is whether MYT can have the desired impact on state owned utilities. It is sometimes stated that public ownership often results in utility managers lacking the motives to effect the improvements required from them and hence MYT may be applied only to privately owned utilities. However, practical experience of implementing an MYT regime highlights that MYT brings about predictability and transparency irrespective of ownership. There is also evidence of several publicly owned companies both in India and elsewhere, which have responded positively to commercial incentives. Needless to say, it would be necessary for the utilities under public ownership to upgrade management practices and incorporate incentive plans for their employees on parameters that help the utilities to respond to commercial incentives in turn. Hence, the Act has made the MYT framework applicable to all distribution licensees irrespective of ownership.

Some of the important aspects of tariff design that have to be taken into account while designing an MYT framework are:

- In the initial stages, the framework should be simple and practical. It may not be practicable for regulators to define the tariff ceilings and let the utilities determine the actual tariffs to be charged for each consumer category. This is because there is a wide divergence between the tariffs and the cost of supply of each consumer category. Hence, regulatory commissions have provided in their regulations that they would determine the retail tariffs for each category.
- The costs that are external to the utilities are allowed as a pass through.
- The initial starting point in determining the revenue allowance and the improvement trajectories could be recognized at 'actual levels' and not the 'desired levels'.
- Benefit sharing mechanisms between utilities and consumers form an integral part of the MYT framework.
- The MYT framework is to be applied for both public and private utilities.

Box 1.2: Experience of United Kingdom – Role of OFGEM, (Office of Gas and Electricity Markets)

United Kingdom (UK) was one of the first countries to implement 'Performance based Regulation' through a 'Price Cap Regulation'. The Price Cap method of tariff calculation separates the profits of the regulated utility from its costs by setting a price ceiling. The method is commonly referred to as the 'RPI-X' model and has been used in UK for more than a decade. In this method, for each rate period, which normally varies between 3-5 years, the price for each year is set based on the Retail Price Index (RPI) and an efficiency factor X. Prices remain fixed for the rate period and the utility keeps or shares the achieved cost savings.

In price cap regulation, the regulator determines the ceiling on prices that can be charged by the distribution companies for various classes of consumers (usually there are only a few classes). Within the cap the utility is free to charge lower to maximize revenues and profitability or to respond to competition.

There are 14 electric distribution companies (discoms) in the UK.

The total revenue of these discoms along with the associated prices for using their networks is regulated by the Office of Gas and Electricity Markets (OFGEM). The total revenues that a regulated discom is allowed to recover from its prices through the price cap mechanism is that it sets an initial starting values for revenues (p_0), specifies an exogenous input price index for adjusting revenues for input price inflation and the associated price levels over time (RPI), and a productivity factor 'x' which further adjusts revenues and profits over time. The p_0 and x values are determined based on a review of the relative efficiency of each firm's operating costs, the firm's current capital rate base, referred to as the firm's regulatory asset value (RAV), forecasts of future capital additions, estimates of the cost of the firm's debt and equity capital, assumptions about the firm's debt-equity ratio, tax allowances and other variables. The allowed revenues for the firm over the 5-year period are the sum of the allowed operating costs and allowed capital costs determined in each year. p_0 and x are chosen so that the present discounted values of the revenues over the five-year period is equal to the present discounted value of the total operating and capital-related charges that have been allowed for each discom during the price review.

Issues and experience of MYT setting process in India

The Multi-year Tariff framework in the Indian electricity sector has been mandated as per section 61 (f) of Electricity Act 2003. Further, the National Tariff Policy outlines a detailed MYT framework for generation, transmission and distribution activities. Subsequent to the Act and the Policy, presently eight states have issued final MYT regulations, which include, Andhra Pradesh, Assam, Kerala, Maharashtra and Madhya Pradesh. Delhi, Jharkhand, Karnataka and West Bengal have brought out draft MYT regulations. Other states such as Gujarat, Orissa and Tamil Nadu have amended their existing tariff regulations to outline a general MYT framework.

While examining the cost components approved by the regulatory commissions of the nine states that have been reviewed in this

study, it is observed that operating costs do not form major proportion of total costs. Most of the operating costs like maintenance expenditure and employees wages are sticky and major variations are not realistic to expect in the short run. In fact, low level of maintenance expenditure often gets translated into low efficiency levels resulting in avoidable voltage fluctuations and breakdowns. While employee costs are to an extent governed by historical behaviour of the firm, maintenance expenditure is determined largely by technical factors. The most important factor in operating costs that can be controlled is the investment program. Investment program varies with the economy's growth rate, load growth of different consumption categories, age of existing equipment, service quality requirements etc. Hence, projecting the costs and benefits of investment becomes the key task in arriving at price caps for multi-year tariffs.

In MYT regulations that have been issued by the regulatory commissions in India, the procedure for determining capital requirement has not been specified. It is in capital expenditure that the possibility of a lower capital allowance and high-powered incentive or a higher capital allowance and low incentive exists. These choices have been tried by OFGEM in UK and have received recognition from academics and regulators. Some of the issues that get reflected through the existing regulations passed by different SERCs specifying an MYT framework are discussed below.

- Data uncertainty - Data uncertainty is a key concern that has been expressed by most SERCs in India while discussing the implementation of MYT framework. Although attempts have been made to provide certainty on application of principles in determination of revenue requirements and tariffs across a multiple year period, most SERCs have tended to keep the duration of the control period relatively short. Lack of robust baseline data leads to difficulties in specifying the trajectory for performance parameters such as AT&C loss levels.
- In many countries, yardstick regulation is based on hedonic regression and frontier cost estimation and also takes into account cost and quality dimensions. In India, the MYT regulations use the simple target setting procedure and quality dimensions have not been adequately addressed while formulating such performance based regulations.
- For establishing performance targets under an MYT framework, it is essential to clearly separate the utility's

generation, transmission and distribution activities before such targets are set for specific parameters.

- Among the nine states that have been studied, the ARR components under an MYT framework have been separately mentioned for generation, transmission, distribution and retail supply in the case of Assam, Andhra Pradesh, Delhi, Jharkhand, Kerala and Madhya Pradesh.
- To incentivise better performance and penalize under-performance, it is necessary to structure incentives and penalties appropriately. For designing such incentives/penalties it is important to set targets based on costs filed by generating company/licensee for the base year after checking for prudence of the same. In India, very few states specify targets in their respective MYT regulations. Except Madhya Pradesh and Assam, all other states that have issued MYT regulations do not specify the expected performance parameters in the MYT regulations but only mention that the Commission shall determine these targets from time to time. The salient features of the MYT regulation with regard to fixing targets in the case of Assam and Madhya Pradesh are discussed below.
 - MYT regulations issued by MPERC specifically mention the targets for performance parameters over the control period in generation (such as availability, auxiliary consumption, PLF, etc), transmission (e.g. transmission system availability, O&M costs) and distribution (loss targets).
 - In Assam, the MYT regulations specify that the loss reduction trajectory is required to be submitted by the licensee for each year of the control period and if the divergence is more than 10% of the initial assumption of losses, then the Commission will make suitable adjustments based on a third party review study.
- Mechanism of sharing gains/losses within the MYT framework should be designed with regard to those factors that are within the control of the applicant and on what basis shall such gains/losses be shared with consumers.
 - In MYT regulations of Assam, the sharing mechanism for gains is such that 50% of additional profit is to be retained by the licensee/generating company, 25% is to be credited to the contingency reserve and 25% is to be passed on to consumers. In case of losses, licensee would be

- allowed to retain 50% of the gains arising out of higher loss reduction than the target and 50% is to be passed on to consumers.
- In Maharashtra, the sharing mechanism is that 1/3rd of the gains are to be passed as rebate in tariffs, 1/3rd is to be retained in a special reserve and 1/3rd may be utilized at the discretion of the utility. In case of losses, 1/3rd of the losses are to be passed on as an additional charge in tariff and the balance is to be absorbed by the utility.
- For establishing normative benchmarks for certain variables such as Working Capital, it is essential that ERCs undertake benchmarking studies to evaluate the Utility's performance.
 - Annual Performance Review: Almost all SERCs have issued MYT regulations that specify annual performance review during each year of the control period. However, it is necessary to caution that the annual performance review should not be used by regulatory commissions as a proxy for revising targets annually. Such a step would defeat the entire objective of a multi-year tariff setting exercise and incentive regulation but will instead complicate the annual tariff filing exercise with a multi period tariff filing. SERCs should examine the option of moving towards an end-of-control period review process, whereby any deviations arising on account of annual variations/fluctuations are accounted for the next control period.

Annexe 1.2 brings out a comparison of the MYT regulations issued by Andhra Pradesh, Assam, Kerala, Madhya Pradesh and Maharashtra and the draft MYT regulations issued by Delhi, Jharkhand and West Bengal. Uttaranchal Electricity Regulatory Commission has not yet issued MYT regulations for the state.

Open access

The Electricity Act 2003 aims to promote competition, protect interest of consumers while supplying electricity to all areas, rationalize electricity tariff, ensure transparent policies regarding subsidies and provide an enabling regulatory environment. Besides allowing for private investments in all segments of the electricity supply chain, the Act has provided for various measures to introduce competition in the electricity industry. One such measure is by introducing non-discriminatory open access in the transmission segment at the outset and mandating SERCs to introduce open access in distribution in a time bound manner after taking into consideration state specific conditions.

Open Access has been defined in section 2 (47) of the Electricity Act 2003 as “the non-discriminatory provision for the use of transmission lines or distribution system or associated facilities with such lines or system by any licensee or consumer or a person engaged in generation in accordance with the regulations specified by the Appropriate Commission.” The regulation for Open Access in inter-state transmission was notified by CERC in January 2004. These regulations are applicable for access to the inter-state transmission system and the transmission customers have been divided into Long-term customers and Short-term customers. The persons availing or intending to avail access to the inter-state transmission system for a period of twenty five years or more were categorized as long-term and the transmission customers other than the long-term customers were the short-term customers.

Presently, twenty states have issued open access regulations. These include Assam, Andhra Pradesh, Chhattisgarh, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttaranchal, West Bengal, Gujarat, Kerala, Delhi and Tripura (draft).

In order to allow some time to the incumbent utilities to adjust to the new environment, the Act has built in transitional provisions in terms of surcharge. The Act mandates the consumer buying power through open access to make a payment to the incumbent discom to compensate for the loss of cross-subsidy. This payment has been termed as surcharge by the Act, which an open access consumer has to pay in addition to the wheeling charge. The level of surcharge has to be determined by the SERC. This surcharge shall be utilised to meet the requirements of current level of cross subsidy within the area of supply of the distribution licensee.¹⁶

Apart from surcharge, the Act mandates payment of an additional surcharge on the charges of wheeling, which would be specified by the SERC. This additional surcharge is levied on the consumer to meet the fixed cost of the existing distribution licensee arising out of his obligation to supply.¹⁷

Sixteen states have finalized methods to be adopted for computation of open access surcharge. These are Tamil Nadu, Madhya Pradesh, Karnataka, Rajasthan, Gujarat, Haryana, Chattisgarh, Jharkhand, Andhra Pradesh, Uttaranchal, Maharashtra, Kerala, Punjab, Assam, West Bengal and Orissa.

¹⁶ Section 42 (2) of Electricity Act 2003

¹⁷ Section 42 (2) of Electricity Act 2003

The National Tariff Policy that was issued in January 2006 highlights that when open access is allowed, the surcharge would be computed as the difference between the tariff applicable to the relevant category of consumers and the cost of the distribution licensee to supply electricity to the consumers of the applicable class. The Policy continues to indicate that the cost of supply to the consumer would be computed as the aggregate of (a) the weighted average of power purchase costs (inclusive of fixed and variable charges) of top 5% power at the margin, in the merit order approved by the SERC adjusted for average loss compensation of the relevant voltage level and (b) the distribution charges determined on the principles as laid down for intra-state transmission charges.

The Policy also mentions that the cross-subsidy surcharge should be brought down progressively at a linear rate to a maximum of 20% of its opening level by the year 2010-11.

As given in Table 1.4, all the 9 SERCs in this study have issued the regulations for intra-state transmission and distribution open access. The details of these regulations with regard to phasing-in, capacity sought to be allocated by the open access consumer, date by which the open access is to be allowed and whether there are charges for open access, applications seeking open access and whether open access is actually taking place in the state have been considered.

It is evident from the table that all the regulations provide the phasing in criteria according to which open access shall be allowed in the state and categorise the customers as short term and long term customers. The various charges that may be levied for providing open access and have to be determined by the Commission are given below:

1. Transmission charge
2. Wheeling charge
3. Cross Subsidy Surcharge
4. Additional Surcharge
5. Grid Support/Parallel Operation Charges (captive generators only)
6. Reactive energy charges
7. Operating charge
8. Imbalance charge
9. Interconnection expense
10. Handling and Service Charge
11. Scheduling and System Operation charge

The regulations of most states detail out only the cross-subsidy and additional surcharge. The open access regulations in Andhra Pradesh, Assam, Madhya Pradesh and West Bengal provide

details of most of the above mentioned charges, while that of Kerala and Jharkhand mention some of these including Reactive energy charge and Scheduling and System Operation charge.

Some SERCs have also stated that they will determine the charges related to open access once they receive an application for the allowing open access. It is also seen that though all the 9 states have issued the open access regulations, very few applications have been received for grant of open access.

Kerala was the first state to have allowed open access (Indal), however, even that is not taking place as the applicant shifted its operations to another state. WBERC has also granted open access to 3 applicants (Electro Steel, HINDALCO and Bhusan Industries Ltd); however, no open access is yet taking place. JSERC has also allowed open access to one applicant (TISCO), however, this has been challenged by the Jharkhand State Electricity Board (JSEB) and therefore, no open access is taking place in the state. No open access is also taking place in Uttaranchal and Delhi. Thus, there has been limited progress made on this front at the state level.

This highlights the fact that although in India, several SERCs have notified the open access regulations besides fixing surcharge, transmission and wheeling charges, it has hardly helped consumers to come forward to avail open access. There may be compelling reasons such as cross subsidy surcharge, unreasonable transmission charges etc., for the consumers not to go in for open access. For instance, a high cross subsidy surcharge may disincentivize open access purchase. The consumer opting for open access has to pay a surcharge to compensate the incumbent distribution licensee for the loss of cross subsidization. Besides this, the consumer would also have to pay the wheeling charge. Therefore, unless the difference between the tariff of incumbent licensee and the tariff of new supplier is more than the summation of all the charges, there would be no tariff advantage that could incentivize open access.

An example of the high level of cross-subsidy surcharge can be observed from those computed in the open access cross subsidy surcharge orders issued by the SERCs of Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Rajasthan and Tamil Nadu. Tables 1.40 and 1.41 give the wheeling charges, voltage wise system losses and quantum of cross-subsidy surcharge as computed in the states of Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Rajasthan and Tamil Nadu.

Table 1.40: Cross subsidy surcharge in Andhra Pradesh

State utilities	Voltage level	Wheeling charges		Cross-subsidy (Rs./unit)
		% losses	(Rs. kVA / Month)	
APCPDCL	33 kV	4.21%	32.7	1.30
	11 kV	11.34%	91.02	1.62
	LT	22.37%	126.44	1.94
APEPDCL	33 kV	6.10%	11.28	1.26
	11 kV	10.85%	56.41	2.06
	LT	19.11%	224	2.06
APNPDCL	33 kV	5.45%	23.49	0.21
	11 kV	11.40%	85.94	1.78
	LT	21.24%	185.52	1.20
APSPDCL	33 kV	4.85%	25.03	0.33
	11 kV	10.34%	109.43	1.48
	LT	18.92%	152.06	1.66

SOURCE APERC Order on determination of surcharge and additional surcharge for FY 2006-07 dated 29.08.07

Table 1.41: Cross subsidy surcharge in Rajasthan, Karnataka, Gujarat, Tamil Nadu and Maharashtra

States	Voltage	Wheeling charge-HT		Cross subsidy surcharge	
		% Losses	Rate of wheeling		
Rajasthan Jaipur	EHT	4.60%	Rs.0.01/unit	Rs. 1.55 per unit	
	HT – 33kV	8.40%	Rs.0.25/unit		
	HT – 11kV	13.40%	Rs.0.28/unit		
	LT	21.15%	Rs.0.77/unit		
Rajasthan Jodhpur	EHT	4.60%	Rs.0.01/unit	Rs. 1.75 per unit	
	HT – 33kV	8.40%	Rs.0.15/unit		
	HT – 11kV	13.40%	Rs.0.17/unit		
	LT	21.15%	Rs.0.58/unit		
Rajasthan Ajmer	EHT	4.60%	Rs.0.01/unit	Rs. 1.56 per unit	
	HT – 33kV	8.40%	Rs.0.22/unit		
	HT – 11kV	13.40%	Rs.0.23/unit		
	LT	21.15%	Rs.0.54/unit		
Gujarat	HT – 66 kV-33kV	10.01%	Rs 74805 MW / Month	Rs. 1.35 per unit	
Karnataka	BESCOM	6.12%	Rs. 0.01	Rs. 1.15 per unit	
	MESCOM	5.80%	Rs. 0.16		
	HESCOM	9.21%	Rs. 0.13		
	GESCOM	6.39%	Rs. 0.13		
Tamil Nadu	HT – 66 kV-33kV	6.00%	Rs.0.20/unit	Rs. 1.60 per unit	
Maharashtra	TPC D		Rs.kVA 150/ month	0	
	REL D		Rs.kVA 35/ month	0	
	MSEDCL	132 kV	Nil	Nil	0
		33 kV	11 %	Rs.kVA 3/ month	0
		22 kV & 11 kV	17 %	Rs.kVA 37/ month	0

States	Voltage	Wheeling charge-HT	Cross subsidy surcharge
	LT	Rs.kVA 113/ month	0

SOURCE

- (1) Rajasthan Electricity Regulatory Commission order for determination of wheeling charges and cross-subsidy surcharge for FY 2006-07 dated 19.09.06
- (2) Gujarat Electricity Regulatory Commission order for determination of transmission charge, wheeling charge and cross subsidy surcharge dated 28.02.06
- (3) Karnataka Electricity Regulatory Commission order for determination of transmission charge, wheeling charge and cross subsidy surcharge dated 09.06.05
- (4) Tamil Nadu Electricity Regulatory Commission order for determination of transmission charge, wheeling charge, cross subsidy surcharge and additional surcharge dated 15.05.06
- (5) Maharashtra Electricity Regulatory Commission order titled Methodology for computation of Cross-Subsidy Surcharge for Open Access transactions dated 05.09.06

It can be inferred from the above tables that in the six states where the cross-subsidy surcharge has been computed ranges from as high as an average surcharge of Rs.1.62/kWh in Rajasthan to as low as '0' in the case of Maharashtra. It also emerges that the system loss for the applicable voltage level that is used in computing the surcharge is highest in the case of Maharashtra at the 33 and 11 kV level. As per the Maharashtra cross subsidy surcharge order, the cross subsidy surcharge works out to zero primarily because the weighted average cost of power purchase of the top 5% at the margin works out to Rs.4.81 per kWh, after adding the effective intra-state transmission tariff. When grossed up for the applicable voltage-wise losses, the power purchase cost further increases. As the average realization of HT categories are lower than the weighted average power purchase cost of top 5% at the margin, the cross subsidy surcharge has been computed as zero.

When the cost of unserved energy needs is examined, it is observed that open access has an important role to play. For instance in the case of Maharashtra¹⁸, in FY 2006-07, the state faced peak shortages as high as 9512 MU (approximately 11.9%; MSEB est.). It has been estimated that in FY 2006-07, as against a demand of 14,000MW in the state, the sources of supply are, (a) contracted generation to Maha Discom is currently 9000 MW and (b) the discom plans another 2997 MW of contracts for 2007. Taking into account these two sources of supply still leaves an expected 13% peak power deficit. The eligible customer market through open access could conceivably contract for as much as 3175 MW from other sources, alleviating all or part of the expected supply shortfall.

The high levels of system losses highlight the uncertainty in supply of power and inadequate back-up support provided by the

¹⁸ Presentation made by Mr. Ashish Khanna, The World Bank at the National Roundtable Discussion on Achieving Competition Objectives of Electricity Act 2003 – Consumer Choice through "Open Access in Distribution", 5th April 2006

state which acts as a major barrier to promote open access. Moreover the high level of overall average charges for providing open access discourages competition and protects the incumbent utilities from cheaper sources of power. However, now that the Government of India is encouraging setting up of merchant power plants, it is hoped that cross subsidy surcharge will be rationalized.

It must be mentioned here that an initiative of a public-private partnership was started in Pune in 2006 to meet a 100 MW shortfall in the city by generating electricity from diesel generators of major industrial units in the area. Maharashtra State Electricity Distribution Company Limited (MSEDCL) has projected a further shortfall of 25 MW and is planning to meet this through increasing output from captive power plants¹⁹. Table 1.42 gives a summary of open access regulations and experience across 9 states.

¹⁹ MSEDCL, CII look to more captive power plants
<http://www.punescoop.com/story/2007/2/9/5285/13327>
(accessed in February 2007)

Table 1.42: Summary of Open Access Regulations and experience across 9 states

State	Date of Issuance of Open Access regulation	Phase	Capacity sought to be allocated by the Open access consumer	Date by which open access shall be allowed	Charges for open access	Application seeking open access	Open Access taking Place	Remarks
Uttaranchal	8-Jun-2004	1	5 MW and above	31-Dec-2005	No	No	No	
		2	3 MW and above	31-Dec-2007				
		3	Above 1 MW	31-Dec-2008				
Madhya Pradesh	24-Jun-2005	1	10 MW or above at 132 kV	16-Jun-2005	Yes As per Draft National Tariff Policy			
		2	5 MW or above at 33 kV. or above and situated in industrial growth centers	16-Jun-2005				
		3	2 MW or above at 33 KV. or above and situated in industrial growth centers	1-Oct-2005				
		4	5 MW and above and situated anywhere in state	1-Apr-2006				
		5	1 MW and above and situated in industrial growth center	1-Oct-2006				
		6	2 MW and above and situated anywhere in state	1-Apr-2007				
		7	1 MW and above and situated anywhere in state	1-Oct-2007				
Delhi	3-Jan-2006	1	5 MW and above	1-Jul-2007	Yes	No	No	
		2	3 MW and above	1-Jan-2008				
		3	1 MW and above	1-Jul-2008				
Kerala	2-Nov-2005	1	10 MW and above	1-Dec-2005		Yes	No	Mandatory open access to the Licensee's transmission system and /or distribution system shall be provided to any person generation electricity through renewable sources
		2	5 MW and above	1-Dec-2006				
		3	3 MW and above	1-Dec-2007				
		4	1 MW and above	1-Dec-2008				
Jharkhand	28-Aug-2005	1	25 MW and more	1-Nov-2005	Yes	Yes	No	
		2	10 MW or more	1-Apr-2006				
		3	1 MW or more	1-Apr-2008				

State	Date of Issuance of Open Access regulation	Phase	Capacity sought to be allocated by the Open access consumer	Date by which open access shall be allowed	Charges for open access	Application seeking open access	Open Access taking Place	Remarks	
Andhra Pradesh	1-Jul-2005	1	Consumers availing of power from NCE developers irrespective of the quantum of contracted capacity	1-Sep-2005					
		2	Contracted capacity being greater than 5 MW	1-Sep-2005					
		3	Contracted capacity being greater than 2 MW	1-Sep-2006					
		4	Contracted capacity being greater than 1 MW	1-Apr-2008					
West Bengal	9-Jun-2004	1	Power from Co-generation and Non-conventional source of energy	1-Aug-2006	No	Yes	No	Mandatory open access to the Licensee's transmission system and /or distribution system shall be provided to any person generation electricity through renewable sources	
		2	10MW and above in single premises	1-Jul-2007					
		3	5MW and above 5MW in single premises	1-Aug-2008					
		4	1MW and above in single premises	1-Jan-2009					
Assam	1-Aug-2005	1	10 MW and above	1-Apr-2006	Yes				
		2	7.5 MW and above	1-Apr-2007					
		3	3 MW and above	1-Apr-2008					
Maharashtra	10-Jun-2004	1	Not less than 5 MVA	1-Apr-2005					
		2	Not less than 2 MVA but less than 5 MVA	1-Apr-2006					
		3	Not less than 1 MVA	1-Apr-2007					

SOURCE TERI Analysis

Renewable Portfolio Standard (RPS) regulations and orders

SERCs are now crucial players in the context of state level policies for renewable energy. Section 61 of the Electricity Act 2003 gives the design to be followed by SERCs while determining tariffs and Section 86 gives the functions of SERCs.

Section 61(h) states the following:

Quote

61. The Appropriate Commission, shall, subject to the provisions of this Act, specify the terms and conditions for the determination of tariff, and in doing so, shall be guided by the following, namely:-

(h) the promotion of co-generation and generation of electricity from renewable sources of energy;”

Unquote

Section 86 (1) (e) states the following

Quote

“to promote co-generation and generation of electricity through renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any persons, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee.”

Unquote

Further, the National Electricity Policy also states the following in this context-

Paragraph 5.2

“Such percentage for purchase of power from non-conventional sources should be made applicable for the tariffs to be determined by the SERCs at the earliest. Progressively the share of electricity from non-conventional sources would need to be increased as prescribed by SERCs. Such purchase by distribution companies shall be through competitive bidding process. Considering the fact that it will take some time before non-conventional technologies compete, in terms of cost, with conventional sources, the Commission may determine an appropriate differential in prices to promote these technologies.”

In addition to the EA 03 and the National Electricity Policy, the National Tariff Policy

Quote

6.4 Non-conventional sources of energy generation including Co-generation:

(1) Pursuant to provisions of section 86(1)(e) of the Act, the Appropriate Commission shall fix a minimum percentage for purchase of energy from such sources taking into account availability of such resources in the region and its impact on retail tariffs. Such percentage for purchase of energy should be made applicable for the tariffs to be determined by the SERCs latest by April 1, 2006.

It will take some time before non-conventional technologies can compete with conventional sources in terms of cost of electricity. Therefore, procurement by distribution companies shall be done at preferential tariffs determined by the Appropriate Commission.

Unquote

The status of the 9 states under study in respect of renewable portfolio standards is given in Table 1.43.

Table 1.43: Status of issuance of RPS Regulation

S.No.	States	Status of final regulation
1	Andhra Pradesh	√
2	Assam	X
3	Delhi	X
4	Jharkhand	X
5	Kerala	√
6	Maharashtra	Order issued
7	Madhya Pradesh	√
8	Uttaranchal	X
9	West Bengal	√

√ - Issued; X - Not issued

SOURCE TERI Compilation

Four out of the nine SERCs, namely, Andhra Pradesh, Kerala, Madhya Pradesh and West Bengal have issued the final RPS regulation. While most SERCs have specified a single target for procurement of power from renewable energy technologies, some SERCs have specified separate technology specific targets. Three states out of the 9 under this study that have issued technology specific standards are Andhra Pradesh, Madhya Pradesh and Kerala. The standards set by them are given in Table 1.44.

Table 1.44: Technology specific standards

S.No.	States	Technology specific standard
1	Andhra Pradesh	5% (0.55 for wind)
2	Kerala	5% (2% for wind)
3	Madhya Pradesh	0.5% (Wind)

SOURCE TERI Compilation

MERC has specified a different target for each year from FY 2006-07 to FY 2009-10 as given in Table 1.45.

Table 1.45: Renewable purchase specifications fixed by MERC

Year	RPS
FY 2006-07	3%
FY 2007-08	4%
FY 2008-09	5%
FY 2009-10	6%

SOURCE http://mercindia.org.in/orders_2006.htm <accessed in December 2006>

Going a step further, WBERC has specified different purchase obligations for different licensees in the state as given in Table 1.46.

Table 1.46: Renewable purchase obligation fixed by WBERC

Licensee	Purchase obligation	
	FY 2006-07	FY 2007-08
WBSEB	1.9%	3.8%
CESC Ltd	1.02%	2.03%
The Durgapur Projects Ltd.	0.72%	1.4%
DPSC Ltd.	0.43%	0.95%

Though the percentage for purchase of energy was to be made applicable for the tariffs to be determined by the SERCs by April 1, 2006, not many SERCS have done this so far.

Way ahead

1. International experience shows that power sector reforms have been successful in countries with adequate generation and transmission capacity. This condition is not satisfied in a number of countries in South Asia. In India too, barring a few states in eastern India and small Himalayan states like Uttaranchal and Himachal Pradesh which have hydro-electric sources of power, other states suffer from insufficient generation and congestion in the transmission systems. The integrated energy policy has succinctly summed up the power situation “that unscheduled outages, load shedding, fluctuating voltage and erratic frequency are common. Consumers and economy bear a large burden of this poor quality of supply. Motors are over designed and consume more electricity. Voltage stabilizers are needed for expensive equipment. Diesel generators provide back up power to industrial and commercial consumers. The extent of shortage varies from state to state”.
2. In 2004 the peak shortage varied from 0 to 25.4% with all India average of 11.7%. Similarly energy shortage varied from 0 to 20.1 percent with all India average of 7.3 percent. These shortages include scheduled cuts, reported load shedding and frequency corrections. However, unscheduled outages and low voltage supplies are not included. The data from the above states whose distribution tariff orders have been discussed in subsequent chapters confirms this. The shortage problem has been exacerbated by the slow progress of generation particularly during Eighth and Ninth Plan periods. Even in the current Plan the total increase in generation capacity will be less than one-year addition in China. With large pent up demand, expansion of coverage acceleration in the growth rate of the natural economy leading to higher energy demand and high- energy intensity of the economy have all contributed to shortages. In Maharashtra, it is relevant to draw attention to the fact that only less than five years back, the Maharashtra State Electricity Board (MSEB) was claiming surplus capacity and this was endorsed by a high powered committee comprised of several experts. In the wake of slow growth in generation capacity, the recent initiative by the Central Government in encouraging competition for the

market and promoting investment in Ultra Mega Power Plants is welcome. But fruits of the proposed investments will be available only in the next decade and till more capacity comes on steam the country will have to live with electricity shortages.

3. The essential conditions for encouraging private investment in a sector are that investors should be confident that they would get adequate returns. This crucially depends in the viability of the distribution sector. The study of the nine states shows that except Andhra Pradesh, others have a long distance to travel before they become commercially viable.
4. Regulators have been given the key role in reforming the sector. Electricity Act 2003 gives them wide ranging powers. The functions and powers given to regulators in electricity sector compare favourably with the best. However, the regulators face the challenge of unfavourable initial conditions. These include the challenge of dealing with state owned utilities, which have overwhelming presence in generation and monopoly in distribution and transmission.

In most states these vertically integrated utilities have been unbundled and converted into corporations. But this has not brought about any change in their management style or incentive system. They continue to function as administrative bodies that are not responsive to economic incentives and “for them the concept of cost does not apply. Their concept of rationality involves following procedures (particularly based on paper work) rather than taking cost benefit based decisions”. They also do not consider themselves directly responsible to the shareholders (i.e. tax payers) nor to the consumers but only to the State Government. In fact in a number of states the Secretary Department of Power is also the Chairperson of the Power Corporations. Thus, the role of the government as policy maker and that of the corporation as implementing agency is devolved in the same person. It is thus not a surprise that the accounts in most cases have not been finalized nor were the tariff petitions filed on time. Despite the change to corporate structure, the provisions of company law relating to prudent accounting practices and publication of quarterly accounts and finalization of balance sheets have been given a miss. The

structural reforms as envisaged by the Government of India and enforced by States do not lead to any substantial change either of the organization or of the administrative nature of the SEB's.

5. The financial institutions that have increased fund flows for generation projects as well as distribution reform schemes like APDRP and Rajiv Gandhi Grameen Vidyutikaran Yojna have not insisted on funds releases being conditional or following the company law provisions or principles of good governance. They are mostly satisfied by the State Governments tendering a guarantee, despite the fact, that over the years, such guarantees have not ensured timely payment.
6. The importance of regulatory practices has been stressed in the study. Assessment of regulatory practices across countries has shown that independent regulation has promoted investment in telecommunication services. Results of concession agreements in Latin America in electricity and roads sector in India have also resulted in attracting fresh investment. However, in India payment security issues have dominated and regulations have not brought about larger inflow of private investments. The share of private investment in all segments of electricity supply remains small. Recent spurt of investment in generation, particularly in Ultra Mega Power Plants is because it has given greater payment security than was available before. However, not much activity is being witnessed in distribution segment of electricity supply.
7. The importance of transparency by the Regulatory Commissions and Public sector companies has been highlighted in this study. However, transparency must extend to the functioning of Regulatory Commissions also. Their budgets and Annual reports should be placed on their websites. They should emulate *Ofgem, the U.K. regulator* which has set the limit on its budget by adopting RPI-3% for the next five years. This would put a check on the cost of regulation and help in improving regulatory effectiveness.
8. Following the practice of Regulatory Commissions in Europe, ERCs in India should announce their annual work plans and time table well ahead of the beginning of the year, so that all the stakeholders prepare

themselves accordingly. This would also indicate the priorities of the Commissions during the year and their performance can be judged against their own work plans. The cost of regulatory delays needs to be estimated in this context.

9. The need for using state of the art techniques in the work of regulatory agencies cannot be overemphasised. For instance, in fixing performance benchmarks, use of sophisticated techniques such as data envelopment analysis or frontier analysis is commonly followed in many countries. But none of the Commissions in this study have used them in their work. Similarly, quality of supply has not been an important factor in tariff determination.
10. Benchmarking in relation to other electricity companies within the country is also missing in most states. For example, if Gujarat or Andhra Pradesh has reached a loss level of about 22-25%, how long will it take State A or B to be there.
11. It is often complained that since public sector agencies do not pay market determined wage levels, persons with commercial orientation do not get attracted and choice gets limited to those willing to work in Government on government salaries and environment. However, there is a change in the air and the most encouraging example is of Gujarat that has recruited two Managing Directors of their unbundled companies from the open market at market determined rates. They have succeeded in bringing about a sea change in the way the employees think and act. As a consequence, the performance improvement of the organisations has been marked. All this has been achieved without any foreign assistance and has grown out of exercise carried out by the erstwhile GEB (Gujarat Electricity Board), with stakeholders and industry experience. All unbundled companies closed FY 2005-06 with a revenue surplus.
12. No Commission has paid attention to environmental sustainability like CO₂ emission per kWh generated, expense for research on renewables and expenditure on promotion of renewables.
13. Regulatory Impact Assessment as a tool for providing systematic assessment of positive and negative impacts of the proposed and existing regulations, with

the aim of improving the quality of a regulatory policy must be used. It not only encourages decision makers to think in a structured way before they act, but also increases accountability of regulatory actions. It can be used to analyse the existing as well as new regulations. In an ex-ante analysis, RIA is conducted prior to the adoption of a proposed regulation. It involves an assessment of other alternatives, and an explanation as to why these alternatives were not selected. On the other hand, an ex-post analysis is conducted on a regulation, which is already in existence. It helps to set examples for regulations in future and also provides an opportunity to take corrective action against previous inaccuracies or mistakes. RIA has been adopted in most OECD (Organisation for Economic Co-operation and Development) countries. On the other hand, despite the considerable interest in measuring the effectiveness of development policy and in the design and implementation of regulation measures, the potential of RIA has neither been explored nor analysed in Indian power sector. The need of hour is to integrate RIA in the decision making process from the beginning to ensure that all important factors and impacts are known when decisions are being made.

14. This study primarily focuses on “Regulatory Substance”, i.e., the ‘what’ of regulation. Regulatory Substance refers to the content of regulation. It is the actual decisions, whether explicit or implicit, made by specified regulatory entities along with the rationale for the decisions. However, attempt has been made to study the other important dimension of “Regulatory Governance. Regulatory Governance refers to the institutional and legal decisions of the regulatory system and is the framework within which decisions are made. Thus, it is the “how” of regulation. It involves issues like independence and accountability of regulator, relationship between regulator and policy maker, autonomy of regulator, process (formal and informal) by which decisions are made, transparency of decision making, predictability of decision making, organisation structure and resources available to the regulator etc. though this study looks into most of these aspects of regulatory governance, it is necessary to conduct a comprehensive assessment of these issues for all the regulatory commissions.

Annexure 1.1 Detailed description of MYT regulations issued by different SERCs

States	Regulation	Control Period	First Year of Control Period	Generation/Transmission/Distribution/Retail Supply	Contents of MYT filing	Controllable Factors	Uncontrollable factors	Targets and Trajectory for controllable factors	Sharing of gains and losses	Incentives/ penalties
Andhra Pradesh	√	First control period = 3 years and subsequent control period = 5 years	FY 2006-07	Separate MYT framework regulation for (a) wheeling and retail sale of electricity and (b) transmission	Components of ARR separately mentioned for Distribution Business, Retail Supply Business and Transmission Business	1.Operation and Maintenance expenses, 2.Return on capital employed, 3.Depreciation, 4.Non-tariff income	1.Taxes on Income, 2.Cost of power purchase	Targets are to be set by the Commission for O&M costs, financing costs and distribution losses; Trajectory for specific variables 'may' be set in case performance can be improved through incentives/ disincentives	No specific mechanism specified; only aggregate gains or losses for the control period as a whole will be considered by the Commission	Incentive/ penalty in the case of transmission losses has been indicated
Assam	√	Generation = First control period, 5 years from 1st April 2006; Transmission = First control period, 3 years from 1st April 2006; Distribution = First control period, 3 years from 1st April 2006	FY 2006-07	Single MYT framework regulation for G,T,D with separate components of ARR specified for generation, transmission, bulk supply and distribution	Components of ARR separately mentioned for Generation (thermal and hydro), Transmission, Bulk Supply and Distribution Business	Not specifically mentioned	Not specifically mentioned	A loss reduction trajectory is required to be submitted by the licensee for each year of the control period; if the divergence in losses is more than 10% of the initial assumption of losses, Commission will make suitable adjustments based on a review study undertaken by a third party	Gains = 50% of additional profit earned from all sources to be retained by licensee/ generating company, 25% to be credited to the contingency reserve of licensee/ generating company, 25% to be passed on to consumers; such gains are to be shared at the end of the control period; In	Incentive specified in case transmission licensee achieves weighted annual availability beyond the target availability as per a specified formula; incentive to be payable by distribution licensee and open access customers in the ration of their average contracted transmission capacity for the year

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States	Regulation	Control Period	First Year of Control Period	Generation/Transmission/Distribution/Retail Supply	Contents of MYT filing	Controllable Factors	Uncontrollable factors	Targets and Trajectory for controllable factors	Sharing of gains and losses	Incentives/ penalties
									case of distribution losses, distribution licensee shall be allowed to retain 50% of gains arising out of higher loss reduction than target and 50% shall be passed on to consumers	
Delhi	√ (draft)	First control period = 4 years and subsequent control period = 5 years	FY 2007-08	Separate MYT framework regulations for generation, transmission and Wheeling & Retail Supply	Components of ARR separately mentioned for Generation tariff, Transmission tariff, Wheeling tariff and Retail Supply tariff	1. Availability of transmission system, 2. Transmission loss, 3. O&M expense, 4. Financing cost, 5. Depreciation and 6. Quality of supply	Not specifically mentioned	Performance targets are to be set for availability of transmission system, transmission loss, O&M expense, financing cost, depreciation and quality of supply	Wheeling and Retail Supply: Aggregate profits after annual adjustments will be shared annually as, 1/3 of the gain to be shared with consumer, 1/3 of gain to be credited to tariff control reserve and 1/3 to be retained by licensee; Transmission: profit sharing formula is to be applied on aggregate profits and losses on account of	Incentive specified in the event of implementation of intra-state ABT @ 25 paise/kWh for ex-bus scheduled energy

States	Regulation	Control Period	First Year of Control Period	Generation/Transmission/Distribution/Retail Supply	Contents of MYT filing	Controllable Factors	Uncontrollable factors	Targets and Trajectory for controllable factors	Sharing of gains and losses	Incentives/ penalties
									individual controllable factors are not to be included, no cap is imposed on profits	
Jharkhand	√ (draft)	First control period = 3 years and subsequent control period = 5 years	Not specified	Single MYT framework regulation for G,T,D with separate components of ARR specified for generation, transmission, distribution and retail sale	Components of ARR separately mentioned for Generation, Distribution Business, Retail Supply Business and Transmission Business	1.Capital expenditure variations, 2.AT&C losses including bad debts, 3.R&M expenses, 4.A&G expenses, 5.Employee cost, 6.Interest charges, 7.Return on Equity	Force Majeure events, changes in law, inflation rate, taxes and statutory levies	Trajectory will be specified by the Commission from time to time which may cover one or more control periods for specific parameters	Gains = 1/3 to be passed as rebate in tariffs, 1/3 to be retained in special reserve, balance amount to be utilized at the discretion of the utility; Losses = 1/3 to be passed on as an additional charge in tariff and balance to be absorbed by the utility	Not specified
Kerala	√	First control period = 3 years and subsequent control period = 5 years	FY 2007-08	MYT framework regulation specified for Distribution and Retail Sale of electricity	Components of ARR separately mentioned for Distribution Business, and Retail Supply Business	1.O&M expenses, 2.Return on Equity,3.Depreciation, 4.Non-tariff income	1.Power Purchase costs, 2.Expenses on account of inflation, 3.Taxes on Income	Not specified	No specific mechanism specified	Not specified

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States	Regulation	Control Period	First Year of Control Period	Generation/Transmission/Distribution/Retail Supply	Contents of MYT filing	Controllable Factors	Uncontrollable factors	Targets and Trajectory for controllable factors	Sharing of gains and losses	Incentives/ penalties
Madhya Pradesh	√	First control period = 3 years	FY 2006-07	Separate MYT framework regulation for (a) generation, (b) transmission, (c) wheeling and retail sale of electricity	Components of ARR separately mentioned for Generation (thermal and hydro), Transmission, Wheeling and Retail supply Business	Not specifically mentioned	Not specifically mentioned	Target norms set for thermal generating stations viz. availability, PLF, gross station heat rate, secondary fuel oil consumption, auxiliary consumption; Transmission system availability fixed at 97% for first 2 years of control period and 97.5% for the last year, O&M expense targets specified for transmission and distribution (to be split between wheeling and retail sale activity) business, distribution loss targets	Gains = Transmission licensee shall be allowed to retain 50% of additional gains and 50% shall be passed on to consumers; Distribution licensee allowed to retain 50% of profits and no specific mention of treatment of remaining 50%	Target PLF values eligible for incentive specified for each year of first control period; Incentive specified in case transmission licensee achieves weighted annual availability beyond the target availability as per a specified formula; incentive to be payable by distribution licensee and open access customers in the ratio of their average contracted transmission capacity for the year; Rebate to consumers for maintaining appropriate power factor, achieving higher load factor or for implementation of energy conservation measures and seasonal surcharge/Time of use surcharge, power factor/load factor surcharge and reactive energy charges to be specified by the

States	Regulation	Control Period	First Year of Control Period	Generation/Transmission/Distribution/Retail Supply	Contents of MYT filing	Controllable Factors	Uncontrollable factors	Targets and Trajectory for controllable factors	Sharing of gains and losses	Incentives/ penalties
										Commission
Maharashtra	√	First control period = 3 years and subsequent control period = 5 years	FY 2006-07	Single MYT framework regulation for Generation, Transmission, Wheeling and Sale of electricity	Components of ARR not separately mentioned for G,T&D	1.Capital expenditure variations, 2.AT&C losses including bad debts, 3.Number of mix of consumers, variations in working capital requirements and labour productivity	Force Majeure events, changes in law, inflation rate, taxes and statutory levies, cost of power purchase	The Commission "may" specify a trajectory for determination of tariff of a generating station	Gains = 1/3 to be passed as rebate in tariffs, 1/3 to be retained in special reserve, balance amount to be utilized at the discretion of the utility; Losses = 1/3 to be passed on as an additional charge in tariff and balance to be absorbed by the utility	Not specified
Uttaranchal	x									

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States	Regulation	Control Period	First Year of Control Period	Generation/Transmission/Distribution/Retail Supply	Contents of MYT filing	Controllable Factors	Uncontrollable factors	Targets and Trajectory for controllable factors	Sharing of gains and losses	Incentives/ penalties
West Bengal	√ (draft)	First control period = 1 year; Second control period = 3 years; Subsequent control periods = 5 years	FY 2007-08	Single MYT framework regulation for Generation, Transmission, Wheeling and Sale of electricity	Components of ARR not separately mentioned for G,T&D	1. Repair and Maintenance expenses, 2. Administration and General expenses, 3. Return on Equity, 4. Depreciation, 5. Non-tariff income	1. Fuel cost, 2. Power Purchase cost, 3. Employee cost, 4. Interest rate and finance charges, 5. Energy Sales volume, 6. Rate of interest on working capital	Trajectory will be specified by the Commission during the control period for specific parameters viz. station heat rate, PLF, Auxiliary consumption, Oil consumption rate, T&D losses	No specific mechanism of sharing gains/ losses; any variation arising out of controllable factors is to be borne by the licensee/ generating company	From time to time the Commission is to specify the set of performance target on different parameters for incentive; such norms are to be applicable from the second control period

Anexure 1.2 Executive summary of study undertaken by TERI for FOIR on tariff orders in 2002

Background

Regulation of electricity tariff is a complex task. Earlier what was used to be a closed-door highly politicised activity; with the advent of the regulatory reforms, efforts have been made to determine tariff apolitically. At present, 22 states have constituted their respective electricity regulatory commissions.

The tariff orders issued by the SERCs (State Electricity Regulatory Commission) have been based on the objective of improving efficiency by reducing T&D (transmission and distribution) losses and other costs, by reducing cross subsidy and by ensuring sector sustainability by giving adequate and fair returns to the utilities.

Objective

As electricity regulation is at a nascent stage in India, there is a requirement for regulatory commissions to share their experiences and replicate the successful practices. Currently, there is a lack of compilation and independent analysis of the tariff orders of the SERCs.

Therefore, the objective of this study was to develop a clear analysis and overview of regulatory decisions that could enhance the know-how of SERCs, while dealing with recurring issues and could benefit regulators and utilities.

In summary, the objectives of the study were:

- to examine the effectiveness of tariff orders issued by the regulatory commissions
- to compare the approaches followed by the regulator and regulated utility to determine tariff
- to bring out non-compliance by the regulated utility and to identify reasons for non-compliance
- to identify gaps and loopholes in various tariff orders that would possibly serve as a basis for future course of action.

Constraints

A study of this magnitude is not without constraints. These constraints, to some extent, have had an impact on the intensity of the analysis that has been presented in this report.

One of the biggest constraints faced in undertaking an in-depth analysis and comparison was the lack of uniformity in the structure of tariff orders. This posed difficulties, particularly, in identifying and understanding the implications on intra- and inter-state comparisons. Further, the information available on actual performance was inadequate to assess compliance. The degree of data sufficiency also varied across different states. There is a lack in transparency and accountability in working of the utilities as their position and reasons for non-compliance is not documented well.

For studying tariff patterns, average realization was taken as a proxy indicator. Since many innovative initiatives are new, it was premature to assess the impact.

Approach

The study has documented analysis of the states where

- either more than two tariff orders have been issued. Therefore, the states of Andhra Pradesh, Haryana, Karnataka, Maharashtra, and Uttar Pradesh have been covered in the report.
- or states with certain peculiar characteristics have been studied. For instance, how the unmetered agricultural consumption is dealt in Punjab has been documented in detail. Similarly, in Uttaranchal the first tariff order reduced industrial tariff by almost 29%.

The report has been divided into three broad sections

- 1 Regulatory approach towards ARR (Annual Revenue Requirement)
- 2 Compliance to regulatory directives and decisions
- 3 Regulatory effectiveness in terms of tariff rationalization, reduction in T&D losses, and other efficiencies.

Before discussing these, it is important to mention about the new regulatory process that has been adopted by the SERCs.

Regulatory process

Unlike in the past, the regulatory legislation enacted in the electricity sector assured that the regulatory process be transparent and consultative. For instance, the electricity regulator in general has adopted a quasi-judicial approach. Section 27 of the ERC (Electricity Regulatory Commission) Act, 1998, mandated that the regulator must hear a person authorized to represent the consumers. The right of consultation with the public was also reiterated by the Supreme Court in its order (3 October 2002) that observed that the

statute (e.g. ERC Act 1998) has given the right of representation to the consumer. Apart from the ERC Act, 1998 (and now the Electricity Act, 2003), the electricity reform legislation as enacted by the individual state governments have also incorporated various provisions for effective public participation and information sharing during the regulatory process.

Application filed to the commission is now made available to all parties and the stakeholders are now given an opportunity to comment on the filed application. A variation of the public hearing process has been observed in some cases. For example, during the determination of tariff for the financial year 2002/03, apart from public hearings, the UPERC (Uttar Pradesh Electricity Regulatory Commission) prepared consultation paper on tariff for stakeholder comments. A notice was issued through newspapers and consumers were invited to comment on the approach.

The APERC (Andhra Pradesh Electricity Regulatory Commission) and KERC (Karnataka Electricity Regulatory Commission) also came up with a consultation paper on 'Multi-year tariff.' However, most of the SERCs have adopted a judicial process of organizing formal public hearing as compared to a more informal process of consultation followed by the telecom regulator in India.

Under the new dispensation, time for completing the entire tariff determination exercise (Figure 1) from the filing of the application to the issue of the tariff order has on average been less than six months across different state electricity regulators as against the ideal time of three months.

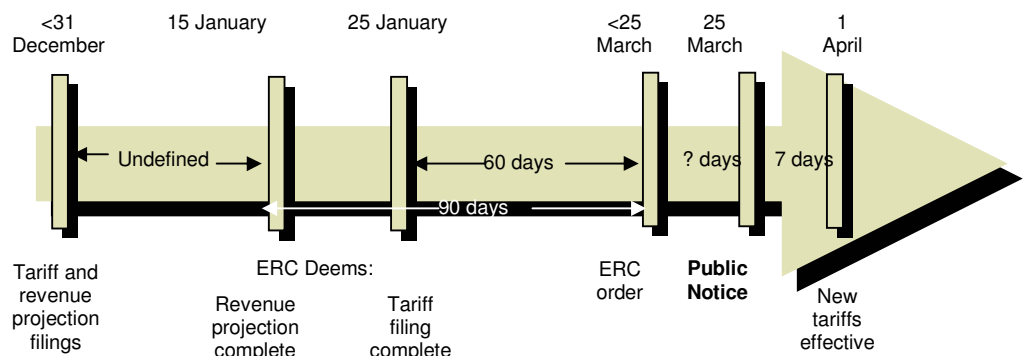


Figure 1 Timeline for tariff determination

Maximum time has been taken for the disposal of the first tariff petition, primarily because of poor baseline data. Even in the

later orders, most of the SERCs have criticized the utilities for not improving the database. The lack of data has a critical bearing on the time taken in disposal of the petition. Other reasons for delay in the disposal of the tariff petition are non-compliance with information formats, data insufficiency and non-availability of data. Table 1 shows the difference in the issue of the first and the second tariff order of different states.

Table 1 Time taken for issue of the first and second tariff order in different states

States	Date of filing for the first tariff order	Months taken	Date of filing for the second tariff order	Months taken
Andhra Pradesh	06 April 2000	2	30 December 2000	3
Haryana	31 December 1999	12	31 March 2001	4
Karnataka	06 July 2000	6	26 November 2001	5
Maharashtra*	15 Oct 1999	7	31 August 2001	8
Madhya Pradesh	07 April 2001	5	20 May 2002	6
Uttar Pradesh	31 December 1999	7	22 January 2001	7
Average		7.3 months		5.5 months

*MERC vide letter 38 of 2002/2004/2436

Regulatory approach towards annual revenue requirement

This section discusses:

- the basis for the proposed revenue requirement with an emphasis on T&D losses, agricultural consumption, power purchase, employee cost and depreciation ;
- the reasons for approval/rejection of proposed estimates by the utility based on the commission's scrutiny of the proposals;
- in addition to the above, the commission's observations and directives on critical issues such as sales estimates, T&D losses, power purchase costs, etc. have been brought out in the study.

T&D losses

Prior to reforms, there was minimal effort to scientifically assess the T&D losses that were often masked in unmetered (primarily agricultural) consumption. However, with the setting up of SERCs, steps have been undertaken to improve the baseline data, either by directing the licensee to conduct various studies or by conducting sample studies on their own. However, there is no uniform method for measuring and setting of T&D losses. For instance, APERC has set targets for reduction in overall costs through various efficiency improvements.

The losses incurred by the utilities on account of non-compliance with the T&D targets have also been handled differently by SERCs. For instance, MERC (Maharashtra Electricity Regulatory Commission) gave an order of equal

sharing of losses between the consumers and the utility in its first order. Subsequently, in its second tariff order, MERC directed MSEB (Maharashtra State Electricity Board) to consider its respective employees responsible for the excessive T&D losses in the respective zones and recover the T&D loss change from its employees after due disciplinary procedure.

States Commissions of states such as Delhi, Karnataka, Maharashtra, and Uttar Pradesh have taken special initiatives for reducing T&D Loss by giving multi-year targets to their respective utilities.

There has been an improvement in the extent metering for all categories of consumers. In case of agricultural consumption, field surveys have been undertaken by few SERCs in order to determine the exact consumption figure to arrive at a realistic estimate of the T&D losses.

Some of the T&D loss measuring approaches and methodologies that have been undertaken by various states are summarized in Box 1.

Box 1 T&D loss measuring approaches and methodologies

States	Transmission and distribution measuring approaches
Andhra Pradesh	Extra high tension loss study conducted Use of proxy measure in terms of efficiency gains
Delhi	AT& C (aggregate [technical and commercial]) approach Separate T&D losses estimated. Metering at feeder level to estimate agricultural demand
Gujarat	Individual estimation of T&D losses
Haryana	T&D (transmission & distribution) losses assessed separately Unmetered consumption through sample metering ²⁰
Karnataka	Zonal level Energy audits for all circles/ zones
Maharashtra	Limited sample study to verify agriculture consumption
Madhya Pradesh	Pilot study by taking a sample of feeders
Orissa	Sample metering to verify agricultural consumption
Punjab	

Power purchase

Almost all SERCs have adopted a merit-order dispatch approach for power procurement. This approach is based on the principle of cost minimization. The analysis revealed varied power purchase per unit of sale and varied PPC (power purchase cost) as a percentage of total cost.

²⁰ It may be noted that in respect of irrigation pumpsets, the consumption was assessed on sample meters, whereas in respect of Bhagya Jyothi the consumption is on the basis of assessed consumption of 18 units per installation per month. Further, in respect of streetlights, the consumption is assessed on the basis of connected load and usage hours. (Source: KERC vide letter A/09/03 dated 20.12.04)

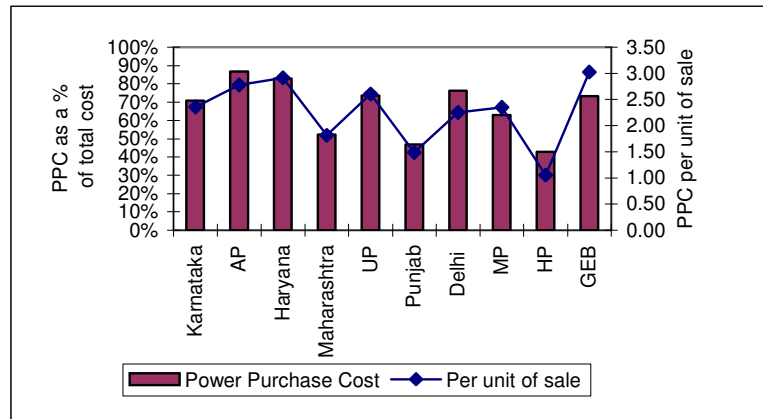


Figure 2 Power Purchase cost across different States (2001-02)

From Figure 2 it is evident that generation and power purchase cost is lowest in Himachal Pradesh and Punjab, which is primarily because of old hydro projects in the states, whereas it is highest in Gujarat and Andhra Pradesh, because stations are either new or are gas (or naphtha) based.

Further, the study revealed that there has been a conflict between Commission and Utility towards power purchase agreements. A lot of times the Commissions have raised objections against power purchase agreements made by the utility.

A classic example for this is the Tanda case in Uttar Pradesh. UPERC had raised its doubts against the PPA (power purchase agreement) of UPPCL (Uttar Pradesh Power Corporation Ltd) with NTPC (National Thermal Power Corporation). The Tanda plant was sold to NTPC for adjustment of past dues of the utility. But later the Commission noted that the utility was buying power from Tanda station at 3.75 rupees per unit. This eventually, turned out to be the most expensive station of NTPC.

Another issue over the PPA cropped between the KPTCL (Karnataka Power Transmission Corporation Limited) and KERC over certain provisions of the utility's PPA with TBPC (Tanir Bavi Power Company). The commission had disallowed the utility to pass through the increased fixed cost in its PPA with TBPC.

Employee cost

The Commissions have attempted to bring about an improvement in employment efficiency by disallowing excess labour force and freezing new recruitment and VRS (voluntary retirement schemes), creating accountability centres, ceasing to provide free electricity to the employees and opting for outsourcing of activities by awarding contracts. Performance of various states in terms of their employee cost as a percentage of total cost and per unit sale is summarized in Figure 3.

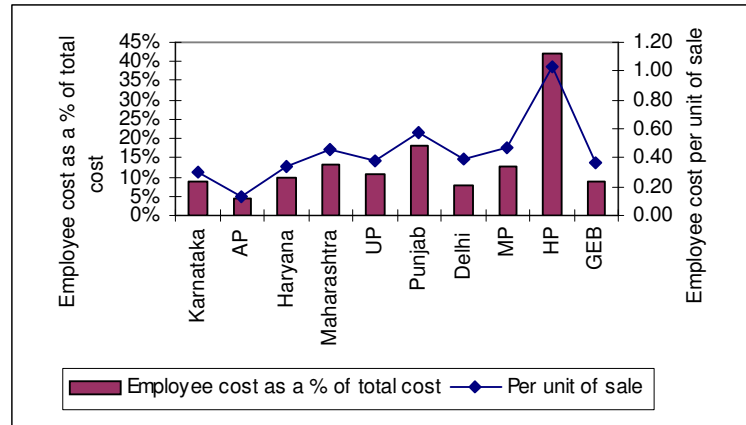


Figure 3 Employee Cost across different states (2001-02)

It is evident from Figure 3 that employee cost is as low as 17 paise per unit of sale in Andhra Pradesh and as high as 105 paise per unit of sale in Himachal Pradesh. Further, as a percentage of the total cost it is the highest in Himachal Pradesh followed by Punjab.

Depreciation

One of the major problems faced by most of the commissions was the lack of availability of a detailed asset classification. A solution accepted by most of the states was to take weighted average of the depreciation rates. The depreciation rates used by various states have been depicted in Figure 4.

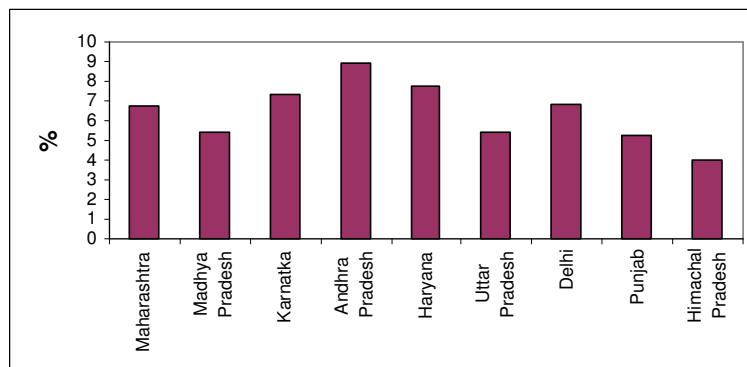


Figure 4 Depreciation rates for 2001/02

As can be seen in Figure 4 there is a wide divergence in depreciation rates adopted by the various SERCs. This has often been a debatable issue.

There has time and again been a mismatch between the depreciation rate proposed by the utility and the rate approved by the commission. In Punjab the utility quoted a depreciation rate of 6.63%. On scrutiny, the commission realized the utility had overestimated the capitalization of hydel assets, attracting lesser depreciation rates; also, past depreciation on transmission assets had been included. Finally, the commission allowed the depreciation rate of 5.23%.

On the contrary to the above, in Himachal Pradesh the commission allowed a higher depreciation rate than the quoted rate of 2.5% by the utility. This was because on scrutiny the commission suggested that the hydel power stations and other assets on average should have a higher depreciation rate than the proposed rate.

Bad debts

There are guidelines issued by the SERCs that the utilities have to abide by for being allowed a provision of bad debt. The utility is to have a clear policy and procedure for the treatment of receivable as a bad debt. It also needs to develop a proper accounting of receivable and effort to realize them. Some Commissions have also directed the utilities to maintain actual write-off of arrears as bad debt in the books of accounts.

Compliance by the utility

Most of the utilities have not followed a majority of the directives issued. Although, in each state the utility has its own reason for non-compliance, but there are certain concerns that are common and cut across all the states.

- There is a lack of information base for the commission to refer to for setting the directives. To build this information base, the commission itself conducts studies or at times directs the utility to conduct one. But, these exercises are time- and resource-consuming.
- When targets are set for the utility, they are based on provisional accounts and not on the final accounts.
- There are certain uncontrollable factors due to which there is non-compliance.
- While taking any pecuniary decision, the commission has to always take into consideration an investment versus efficiency improvement trade off.

Regulatory effectiveness

Regulatory effectiveness can be judged in terms of improvement in utility performance through reduction in T&D losses,

improvement in employee efficiency, tariff rationalization, and reduction in cross-subsidy over the years.

In terms of stakeholder participation during the tariff determination process, the study has analysed both the levels of consumer participation in various states and also the change in number of consumers over the years. In most of the states, the number of participants have increased over the years, except Uttar Pradesh; moreover the number of objectors, i.e. those who filed objections against the petition was the highest in Karnataka while it was the lowest in Haryana. The possible reasons for varied consumer participation could be increased public awareness in few states as compared to others. For instance, in Karnataka, the reason for increased public participation was KERC's consumer advocacy cell. Also, another reason for varied consumer participation was the proposed tariff increase by the utility.

T&D losses

Before the regulatory reform process began, the electricity utilities were showing lower levels of T&D losses as compared to the actual losses. One of the biggest achievements of the regulatory process has been the recognition of the actual levels of T&D losses in the states by the utilities. This is clearly visible in Table 2.

Table 2 T&D losses across different states

	Prior reforms**	1999/00	2000/01	2001/02	2002/03	2003/04
Andhra Pradesh	18.90	35.20	33.90	31.49	28.84	24.63
-APCPDCL			44.33	35.01	23.00	19.19
Karnataka*	18.90	38.00	36.50	34.10	31.9	30.89
Haryana	28.50	48.96	47.67	44.52		
Maharashtra	15.30	29.00	39.40	33.2***		
Uttar Pradesh	22.60	41.55	41.40	38.76	33.60	
Madhya Pradesh	20.10		47.17	49.00		
Orissa	23.80	46.90	46.90	50.50		
Punjab	18.30			27.52	25.61	

* KERC vide letter A/09/03 dated 29.12.03

***Commission approved

SOURCE Planning Commission SEB Annual report (1994-95)

As Table 2 shows there has been a sharp increase in the T&D losses estimated by the utilities after the beginning of the regulatory process. This in most cases is due to an accurate estimation of electricity consumption for unmetered categories like agriculture.

Even though, thereafter, there have been decrease in the T&D losses in all the states, but an exceptional case in this regard has

been the APCPDL (Central Power Distribution Company of Andhra Pradesh Limited). The APCDPDCL started operations with an initial distribution loss level of 44.33% in 2000/01 and has been able to reduce it to 23% in 2002/03. The APERC accepted their projection of 19.19% for 2003/04. This is an exemplary example of a substantial reduction in losses for a utility that is still in the public sector domain.

Employee productivity

Employee efficiency has been measured through two parameters: employee cost per unit of sale and number of consumers per sale.

Employee cost per unit of sale, which is a crucial measure and many states have used this measure while scrutinizing the employee cost. Figure 5 shows how different states have performed in terms of their employee cost per unit of sale.

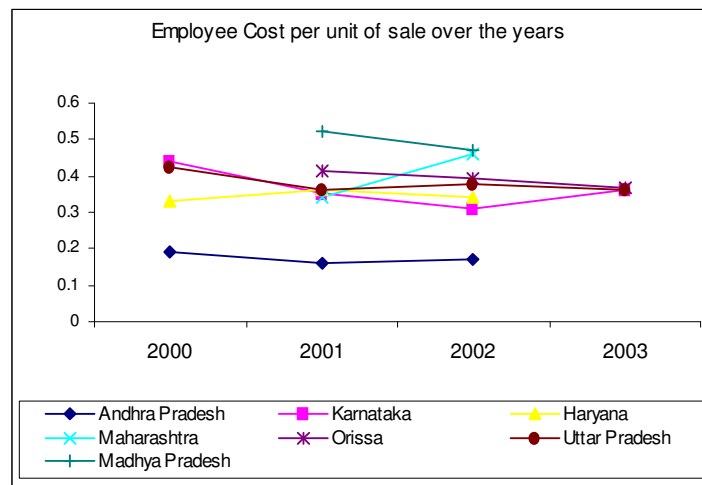


Figure 5 Employee cost per unit of sale over the years

To a certain extent the reason for varied employee cost per unit over the years within the state and also across the states is the lower quantity of energy sold, but if the sales increase the per unit employee cost will reduce. Andhra Pradesh has successively over the years achieved the lowest employee cost. In most of the states, there has been a reduction in employee cost per unit of sale. Apart from other reasons, this was due to the freezing on new recruitment and the retirement of existing employees resulting in the reduction of total number of employees, and hence the cost.

The number of consumers per employee is another indicator for employee productivity, which is the number of consumers catered to by each employee.

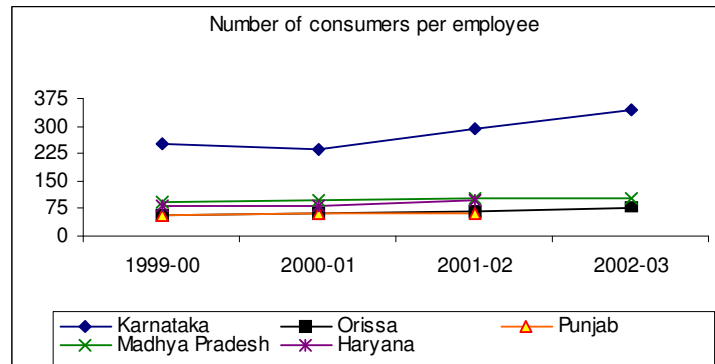


Figure 6 Number of consumers per employee

To sum up, over the years there has been an increase in the employee productivity through reduction in employee cost per unit of sale and through increase in number of consumers served by an employee.

Tariff rationalization

To rationalize tariff design and rate is perhaps the main objective of setting up SERCs. By and large, SERCs have approved reduction in the number of categories of consumers and slabs of tariff rates. All these efforts make it easier for the utilities to calculate the final electricity bill. The consumers also benefit from this as it becomes easier for them to understand the tariff calculations. Such an exercise also checks the malpractices and the corruption in the system.

No uniform approach for reduction in the tariff rates has been followed by the SERCs. In the case of Maharashtra, the MERC reduced the number of slabs in the domestic, commercial, LT, Industrial and the agricultural category. On the other hand, HPERC (Himachal Pradesh Electricity Regulatory Commission) did away with all the slabs in the commercial category and decreased slabs in case of the industry category.

In certain cases there have been problems in implementation also. In Andhra Pradesh, for instance, a major hue and cry was made after the commission had reduced the number of slabs from six to four. Because of the pressure, the commission restored to six slabs. In the subsequent Tariff Order (FY2003), the commission decreased the slabs to five. APERC had also merged all slabs in the LT (Low Tension) and HT (High Tension) industry.

For certain SERCs rationalization does not imply a decrease in the number of slabs. A case in this regard is KERC (Karnataka Electricity Regulatory Commission). The commission carried out intra-category rationalization for all categories to reflect better representation, and subsequently increased the number of slabs in the domestic category.

Some states have grouped different categories of consumers according to voltage supply rather than the conventional way of user separation. Further, time-of-use tariffs have been more widely recognized and many commissions have introduced peak and off-peak tariff.

Also, most regulatory commissions have dealt with the crucial issue of cross-subsidy. To some extent, reduction in cross-subsidy has been achieved in the orders issued by the SERCs. The average cost of supply²¹ has been compared with the average realization from each category to arrive at the cross-subsidy.

Emphasis is laid on agriculture, industry (HT), and domestic categories of consumers. The tariff for agricultural sector has always been an important issue and, therefore, has been discussed separately in the report.

Another benchmark to measure tariff rationalization is to compare the percentage of cost of recovery of the cost of supply through the approved tariff.

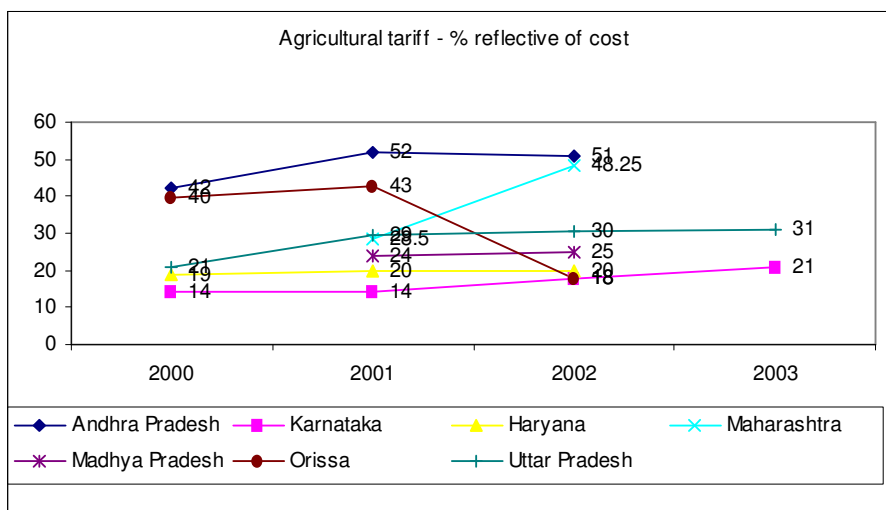


Figure 7 Agriculture tariff as a percentage of cost

Maharashtra Source: MERC vide letter 38 of 2002/2004/2436 dated 28.12.2004

²¹¹ Ideally cost of supply would be different for different consumers, but considering the constraints of collecting data the average cost of supply would be taken.

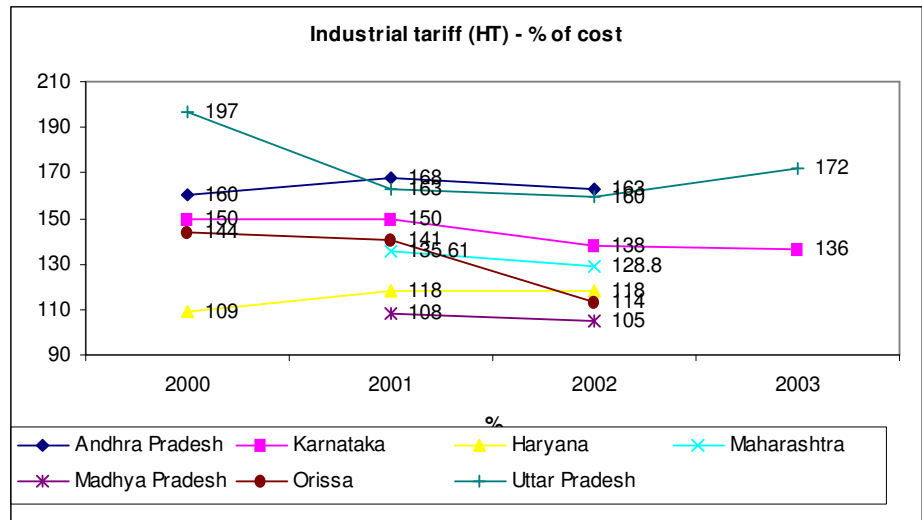


Figure 8 industrial tariffs as a percentage of cost

Maharashtra Source: MERC vide letter 38 of 2002/2004/2436 dated 28.12.2004

From Figures 7 and 8, one can conclude that in most of the states the industrial tariff as a percentage of average cost has declined, whereas agricultural tariff as a percentage of cost of supply has increased to represent the average cost of supply.

Another important indicator used in the study was the CI (convergence index). It is a medium to measure the extent to which the average realization from each category converged towards overall realization.

$$CI = \sqrt{\frac{\sum[(ARC/OAR)-1]^2 Sc}{\sum Sc}}$$

Where

CI = Convergence index

Arc = Average realization

Sc = Sales from each category

OA = Overall average revenue

If for all consumer categories, the average tariffs are equal, then the ratio of these two (Arc/Oar) will be 1 and hence CI becomes zero. Therefore, the index should gradually approach towards zero. Table 3 gives the value for the index for nine states.

Table 3 Convergence Indices for different states over the years

States	1999/2000	2000/01	2001/02	2002/03
Andhra Pradesh	0.9686	0.5625	0.5183	0.5440
Haryana	0.8283	0.5000	0.5565	N/A
Karnataka	1.1922	0.8660	0.8049	0.6720
Maharashtra	N/A	0.6059	0.3526	N/A
Madhya Pradesh	N/A	0.6683	0.5501	N/A
Orissa	0.0536	0.0671	N/A	N/A
Punjab	N/A	N/A	0.1799	0.0260
Uttaranchal	N/A	N/A	0.4131	0.3701
Uttar Pradesh	0.6400	0.5684	0.4658	0.4551

It is evident from Table 3 that there has been a decline in the cross-subsidy in most states. This decline is remarkably higher in the first year of tariff rationalization.

Government support and subsidy

In terms of budgetary support, in most of the states there has been an increase in the subsidy given to the power sector. The only exception is Orissa, where distribution business is privatized and no subsidy for tariff is given.

Table 4 Subsidies given by the state governments (Rs. Crores)

States	1999/00	2000/01	2001/02	2002/03
Maharashtra**	N/A	745.82	493.37	833
Karnataka*	769	1246	1872	1699
Haryana	N/A	613	763	815
Madhya Pradesh	0.53	313.12	279.45	1675.5
Orissa	N/A	N/A	N/A	N/A
Uttar Pradesh	N/A	790	950	850
Andhra Pradesh	N/A	1626	1561	1509
Punjab	N/A	N/A	N/A	950

*SOURCE KERC vide letter A/09/03 dated 29.12.04

**SOURCE MERC vide letter 38 of 2002/2004/2436 dated 28.12.2004

CHAPTER 2 Andhra Pradesh

Introduction

The Andhra Pradesh Electricity Regulatory Commission (hereinafter referred to as the APERC or the Commission) was established in 1999 under the provisions of the Andhra Pradesh Electricity Reform (APER) Act 1998. In February 1999, the Andhra Pradesh State Electricity Board (APSEB) was unbundled into Andhra Pradesh Power Generation Corporation (APGENCO) and Transmission Corporation of Andhra Pradesh Limited (APTRANSCO). While APGENCO was mandated to acquire, establish, construct and operate power-generating stations in the state, APTRANSCO was made responsible both for Transmission & Bulk Supply and for Distribution and Retail Supply. In March 2000, in accordance to the provisions of the APER Act, the Commission granted approval to APTRANSCO to transfer its distribution and retail supply business to four Distribution Companies (DISCOMs). In May 2000, APERC issued its first Tariff Order for FY 2000-01 for APTRANSCO (including distribution business). In this tariff order, the Commission adopted the 'true cost of supply' principle for determining retail tariffs as compared to the earlier 'nature and purpose of use' basis.

On 29th December 2000, the Commission granted licenses to the four DISCOMs, thereby forming the following Distribution and Retail Supply licensees:

- Northern Power Distribution Company of Andhra Pradesh Limited (APNPDCL) to cater to the districts of Warangal, Karminar, Khammam, Nizamabad and Adilabad
- Eastern Power Distribution Company of Andhra Pradesh Limited (APEPDCL) to cater to the operation circles of Srikakulam, Visakhapatnam, Vizianagaram, East and West Godavari districts and 17 Divisions of coastal Andhra Pradesh
- Central Power Distribution Company of Andhra Pradesh Limited (APCPDCL) to cater to the districts of Anantapur, Kurnool, Mahaboobnagar, Nalgonda, Medak and Rangareddy
- Southern Power Distribution Company of Andhra Pradesh Limited (APSPDCL) to cater to the districts of Krishna, Guntur, Pakasam, Nellore, Chittoor and Kapada

APERC also awarded licenses to nine Rural Electric Cooperative Societies (RESCOs) operating in the state.

The Electricity Act (hereinafter EA 2003 or the Act) was notified in June 2003. Even though the Act replaced three existing central legislations, Section 185 (1) clearly mentions that provisions of state Reform Acts (including APER Act 1998) not inconsistent with provisions of the Act shall remain in force. Therefore, the Commission continues to be guided by the provisions of the A.P. Reform Act.

Between FY 2000-01 and FY 2005-06, APERC issued six tariff orders for transmission, distribution and retail supply. In March 2006, the Commission introduced a multi-year tariff regime by issuing separate orders for distribution tariff (FY 2006-07 to FY 2008-09) and Retail Supply (FY 2006-07) and for Transmission business (FY 2006-07 to FY 2008-09).

Demand supply gap

Table 2.1 and 2.2 give the demand- supply position in the state from FY 1998-99 to FY 2005-06.

Table 2.1: Actual power supply position (Net MU)

Year	Requirement	Availability	Deficit	
	MU	MU	MU	%
FY 1998-99	41958.0	38293.0	3665.0	8.7
FY 1999-00	45835.0	42832.0	3003.0	6.6
FY 2000-01	47792.0	44055.0	3737.0	7.8
FY 2001-02	48394.0	44302.0	4092.0	8.5
FY 2002-03	47223.0	44014.0	3209.0	6.8
FY 2003-04	48080.0	46680.0	1400.0	2.9
FY 2004-05	50416.0	50061.0	355.0	0.7
FY 2005-06	52721.0	52154.0	567.0	1.1

Source: Power Sector Profiles (May 2006), Ministry of Power, Gol, Project Monitoring Cell

Table 2.2: Peak Demand vs. Availability (MU)

Year	Peak Demand	Peak Met	Deficit	
	MW	MW	MW	%
FY 1998-99	6770.0	6139.0	631	9.3
FY 1999-00	7209.0	6366.0	843	11.7
FY 2000-01	8000.0	6835.0	1165	14.6
FY 2001-02	8585.0	6873.0	1712	19.9
FY 2002-03	8491.0	6858.0	1633	19.2
FY 2003-04	8679.0	7769.0	910	10.5
FY 2004-05	8093.0	7903.0	190	2.3
FY 2005-06	8716.0	8542.0	174	2.0

Source: Power Sector Profiles, May 2006, Ministry of Power, Gol, Project Monitoring Cell

The above tables highlight that while Andhra Pradesh continues to face deficit in both power-supply and peak availability, there has been an improvement over the years. The deficit in power availability, which was 8.7% in FY 1998-99 reduced to 1.1% in FY 2005-06. This has been accomplished by initiating demand side management (DSM) measures, restricting rural supply to 7 hours and limiting the power purchase by DISCOMs to the approved level. On the other hand, peak deficit has fluctuated

from 9.3% in FY 1998-99 to 19.9% in FY 2001-02 and to 2.0% in FY 2005-06.

Movement in Installed Capacity

The installed capacity of electricity in Andhra Pradesh that was 6198.1 MW in FY 1999-00 increased to 8859.7 MW in FY 2005-06. During this period, the installed capacity of thermal plants increased from 2952.5 MW to 2989.3 MW at a marginal CAGR of 0.2%. Hydroelectric capacity of the state has increased from 2614.0 MW to 3586.4 MW indicating a CAGR of 5.4%. The capacity of gas-based plants has increased from 542.0 MW to 1738.7 MW or a CAGR of 21.4%.

In terms of trend in installed capacity by ownership, in FY 2005-06, the state sector contributed 6938.9 MW or 61% of the total capacity. On the other hand, the share of private sector has increased from 11.6% in FY 2000-01 to 17.0% in FY 2005-06. The share of central sector projects in installed capacity increased from 901.0 MW (11.9%) in FY 2000-01 to 2465.8 MW (21.8%) in FY 2005-06.

FY 2000-01, FY 2001-02 and FY 2002-03 in retrospect

The financial losses of the four DISCOMs and, hence, the government subsidy to bridge this gap have shown a declining trend between FY 2000-01 and FY 2002-03. Table 2.3 summarizes the performance of the distribution licensees on certain operational and financial parameters.

Table 2.3: Performance of DISCOMs in FY 2000-01, FY 2001-02 & FY 2002-03

	FY 2000-01	FY 2001-02	FY 2002-03
<i>Energy Parameters</i>			
Sales by DISCOMs (MU)	26976.0	28556.0	31277.0
T&D Loss Levels (%)	35.5%	29.8%	27.6%
Metered Sales/Total Purchases (%)	38.1%	42.7%	46.4%
<i>Financial Position and Subsidy</i>			
Profit of Licensees (Approved) (Rs Crore)	-1024.0	-876.0	-819.0
Revenue Realized/Units Sold (Rs/kWh)	2.1	2.2	2.3
Cost Incurred/Units Sold Rs/kWh)	3.3	3.2	2.9
Cost Coverage (%)	62.5%	68.4%	80.2%
Additional Government Support Provided (Rs Crore)	1133.0	896.0	350.0
<i>Cross Subsidy</i>			
Cross subsidy amount (Rs. Crore)	1939.0	1970.0	2110.0
Cross Subsidy/subsidising unit (Rs./unit)	2.1	2.0	1.80

Source: Tariff Order issued by APERC for FY 2003-04

The above table indicates that the four DISCOMs have not only improved their sales performance and reduced T&D losses but also improved financial performance and cost coverage. Simultaneously, reform initiatives have reduced the level of cross subsidy.

This chapter analyses the Tariff Order issued by APERC for FY 2003-04, FY 2004-05 and FY 2005-06. Since FY 2000-01, the Commission has been issuing combined orders for APTRANSCO and the 4 distribution licensees. In computing the revenue requirement for each DISCOM, APERC takes on record the actual expenditure (major cost items being power purchase and wages) and adjusts the same with non-tariff income and wheeling charges. The Commission subsequently computes the net revenue gap by adjusting the revenue requirement with actual revenue (primarily, income through tariff levied on various consumer categories) and expected efficiency gains.

Consumption and Access

Sales/Demand estimation

The sales forecast for various consumer categories is based on trend analysis of the recorded sales for six months of current fiscal and the estimated sales for next six months of the ensuing fiscal. In their filings, the DISCOMS typically consider parameters such as increase in metered sales, rise in number of services, applications on hand for new releases and new releases in the past etc. In FY 2004-05, APERC directed DISCOMS to ascertain the sales growth on account of existing and new consumers separately and on the basis of sub-units such as districts, divisions, sub-divisions and sections. Further, to increase accuracy of the forecast, the Commission mandated the licensees to analyse consumption behaviour across time, income levels and line of activity. It also required the DISCOMS to produce monthly progress reports on section-wise sales for each category of consumers. The Commission has been using this monthly sales database for cross-validating actual sales filed by the DISCOMS and for evaluating the sales forecast. In FY 2005-06 Tariff Order, APERC directed the DISCOMS to file circle/district wise sales forecast for FY 2006-07 in a pre-specified format.

In terms of expected sales, for FY 2003-04, the DISCOMS projected 33036.9 MU, which was about 5.9% (1742.0 MU) higher than in FY 2002-03. This increase in sales was largely attributed by the DISCOMS to higher HT sales, and more specifically to the migration of captive/third party sales back to the licensees and to the emergence of new industries. However, the Commission in its order approved 33457.5 MU of sales, which was about 420 MU higher than the filing. This revision in approved sales can be credited to higher expected sales to agriculture and HT industry categories.

For FY 2004-05, the DISCOMS projected 34737 MU of sales, of which APERC approved sales of about 34235 MU. The

difference between sales forecasted and sales approved (503.2 MU) was due to the lower approved volumes, mostly in the LT agriculture category. For this category, the DISCOMs had indicated higher consumption on account of release of new services under the Tatkal scheme, which was announced in the State Budget for FY 2004-05. However, as the DISCOMs had failed to provide service-wise information to support the underlying consumption estimates, APERC did not approve sales under this scheme.

For FY 2005-06, the DISCOMs anticipated electricity sales of 40017.7 MU, of which APERC approved sales of about 38442.2 MU. In their filings, the DISCOMs had projected higher LT agriculture sales based on the consumption estimates from LV side meter readings on the DTRs and on supporting information such as new services to be released and consumption under the Tatkal scheme. The expected sales also included consumption in the area served by the 5 RESCOs, which were merged with the DISCOMs in FY 2004-05. In computing the sales volume for the LT agriculture category for FY 2005-06, APERC has adopted consumption volumes approved for FY 2004-05 as the base and raised this base level by 50% of the growth rate observed during FY 2004-05. The Commission attributed its decision to utilize the FY 2004-05 sales as the base primarily to lesser reliability of contemporary data, both in terms of the coverage and quality. The methodology and estimation of agricultural consumption is detailed separately below.

A comparison of the sales for the four DISCOMs from FY 2003-04 to FY 2005-06 is presented in Table 2.4.

Table 2.4: Sales by DISCOMs: Projected and Approved (MU)

Consumer Category	Projected Sales			Approved Sales			CAGR
	FY 2003-04	FY 2004-05	FY 2005-06	FY 2003-04	FY 2004-05	FY 2005-06	
LT I: Domestic	8205.8	7959.0	8597.4	8205.8	7887.0	8597.4	2.4%
LT II: Non-Domestic and Commercial	1814.0	1871.0	1970.4	1814.0	1795.0	1970.4	4.2%
LT III: Industry	2240.6	2030.0	2290.4	2240.6	1950.0	2290.4	1.1%
LT IV: Cottage Industries and Dobighats	32.8	38.0	46.0	32.8	35.0	46.0	18.4%
LT V: Agriculture	10998.0	11800.0	14203.5	11350.0	11450.0	12646.8	5.6%
LT VI: Street Lighting and PWS Schemes	696.8	941.0	1304.7	696.8	1054.0	1304.7	36.8%
LT VII: General Purpose	101.3	110.0	112.6	101.3	98.0	112.6	5.4%
LT VIII: Temporary Supply	20.3	6.0	8.5	20.3	9	8.5	-35.3%
Sub-Total: Low Tension	24109.5	24755.0	28533.5	24461.5	24278	26976.8	5.0%
HT I: Industrial – General	5417.4	6523.0	7119.0	5531.4	6567	7119.0	14.3%
HT I: Ferro Alloys/Power Intensive	-	-	1063.0	-	-	1063.0	
HT II: Industrial – Others	818.2	737.0	936.0	818.1	730	936.0	7.0%
HT IV: Agriculture and Irrigation	175.7	187.0	229.7	175.7	188	229.7	13.4%
HT V: Railway Traction	1155.4	1154.0	1205.5	1155.4	1152	1205.5	2.1%

Consumer Category	Projected Sales			Approved Sales			CAGR
	FY 2003-04	FY 2004-05	FY 2005-06	FY 2003-04	FY 2004-05	FY 2005-06	
HTVI: Townships and Residential Colonies	182.4	199.0	244.3	182.4	197	244.3	15.7%
RESCOS (Cat-VII)	1166.4	1181.0	684.8	1121.0	1121	666.1	-22.9%
Temporary (Cat-VIII)	12.0	1.0	1.8	12.0	1	1.8	-61.3%
Sub-Total: High Tension	8927.5	9982.0	11484.2	8996.0	9956	11465.4	12.9%
Total DISCOM Sales	33036.9	34737.0	40017.7	33457.5	34234	38442.2	7.2%

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It can be observed from above that approved sales increased from 33457.5 MU to 38442.2 MU at a CAGR of 7.2%. The highest increase in the LT category was approved for Street Lighting and PWS Scheme followed by Cottage Industries and Dhobighats. On the other hand, approved sales to the LT 'Temporary Supply' category declined at a CAGR of 35.3%. The licensees projected a substantial increase in projected sales for LT Agricultural category due to the take-over of five of the RESCOs by DISCOMs and anticipated increase of new agricultural connections and possible energy savings on account of DSM measures during FY 2005-06. However, the Commission approved a lower amount based on non-reliability of underlying data on LV side meter readings on DTRs. Within the HT category, the approved sales increased for townships and residential colonies, industrial, agriculture and irrigation categories. However, approved sales have declined for the temporary and RESCOs categories. The movement of actual sales and trend of category-wise to total sales over the period under study are presented in Table 2.5.

Table 2.5: All DISCOMs: Actual sales and trend of category-wise to total sales

Consumer Category	Actual Sales (MU)			Proportion of total (%age)		
	FY 2003-04	FY 2004-05	FY 2005-06	FY 2003-04	FY 2004-05	FY 2005-06
LT I: Domestic	7180.2	7791.5	8535.0	21.2%	20.7%	21.4%
LT II: Non-Domestic and Commercial	1658.9	1831.6	2070.0	4.9%	4.9%	5.2%
LT III: Industry	1962.1	2122.8	2232.0	5.8%	5.6%	5.6%
LT IV: Cottage Industries and Dhobighats	35.6	40.7	40.6	0.1%	0.1%	0.1%
LT V: Agriculture	12411.0	13394.4	13284.0	36.7%	35.6%	33.3%
LT VI: Street Lighting and PWS Schemes	1012.1	1143.9	1222.0	3.0%	3.0%	3.1%
LT VII: General Purpose	94.2	104.1	115.9	0.3%	0.3%	0.3%
LT VIII: Temporary Supply	4.7	8.3	3.0	0.0%	0.0%	0.0%
Sub-Total: Low Tension	24358.8	26437.3	27502.5	72.1%	70.3%	69.0%
HT I: Industrial – General	5394.0	6647.1	8026.0	16.0%	17.7%	20.1%
HT I: Ferro Alloys/Power Intensive	681.0	823.0	662.0	2.0%	2.2%	1.7%
HT II: Industrial – Others	716.0	889.9	1074.0	2.1%	2.4%	2.7%
HT IV: Agriculture and Irrigation	103.3	212.8	249.6	0.3%	0.6%	0.6%
HT V: Railway Traction	1128.9	1172.5	1215.9	3.3%	3.1%	3.0%
HTVI: Townships and Residential Colonies	196.5	242.7	292.0	0.6%	0.6%	0.7%
RESCOS (Cat-VII)	1180.5	1184.1	864.0	3.5%	3.1%	2.2%
Temporary (Cat-VIII)	31.8	4.0	0.0	0.1%	0.0%	0.0%
Sub-Total: High Tension	9431.9	11176.0	12383.5	27.9%	29.7%	31.0%
Total DISCOM Sales	33790.7	37613.3	39885.9	100.0%	100.0%	100.0%

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It can be observed from the above table that while the contribution of HT category to total sales has increased, that of the LT category has shown a downward trend. Within the LT category, agricultural sales as proportion of total sales have declined. However, industry (general) sales have increased, which could be attributed to the incentive scheme launched by the licensees to bring the HT industrial consumers back into grid supply.

DISCOM-wise Sales Forecast

Northern Power Distribution Company of Andhra Pradesh Limited (APNPDCL): For FY 2003-04, APERC approved sales of 6295.4 MU as against the projection of 6254.4 MU by APNPDCL. The difference between approved and projected sales can be attributed to Commission's higher estimate for LT agriculture category and for RESCOs. However, in FY 2004-05, the Commission approved sales of 6155.5 MU, which was lower than the DISCOM projected sales of 6273.6 MU. The difference was on account of reduced sales approved for both LT and HT categories. In FY 2005-06, as in the previous year, APERC approved a lower sales volume for the licensee. The reduced sales forecast was largely based on the Commission's lower estimate of sales to the LT Agriculture category. For this year, the Commission approved a sales volume of 6505.8 MU, compared to projected sales of 6587.0 MU by the DISCOM. Table 2.6 presents a comparison of the sales projected by APNPDCL with those approved by APERC.

Table 2.6: Sales by APNPDCL: Projected and Approved (MU)

Consumer Category	Projected Sales			Approved Sales		
	FY 2003-04	FY 2004-05	FY 2005-06	FY 2003-04	FY 2004-05	FY 2005-06
LT I: Domestic	1256.3	1182.3	1244.9	1256.3	1182.3	1244.9
LT II: Non-Domestic and Commercial	202.0	195.7	217.1	202.0	195.7	217.1
LT III: Industry	247.5	224.0	264.5	247.5	224.0	264.5
LT IV: Cottage Industries and Dobighats	3.6	4.3	4.4	3.6	4.3	4.4
LT V: Agriculture	2734.0	2800.0	2982.7	2800.0	2700.0	2908.4
LT VI: Street Lighting and PWS Schemes	136.4	209.1	236.6	136.4	209.1	236.6
LT VII: General Purpose	12.0	13.0	13.9	12.0	13.0	13.9
LT VIII: Temporary Supply	0.3	1.0	1.1	0.3	1.0	1.1
Sub-Total: Low Tension	4592.1	4629.3	4965.2	4658.1	4529.3	4890.9
HT I: Industrial – General	834.0	807.8	786.0	834.0	807.8	786.0
HT II: Industrial – Others	49.0	48.5	41.6	49.0	48.5	41.6
HT IV: Agriculture and Irrigation	7.0	15.7	18.0	7.0	15.7	18.0
HT V: Railway Traction	296.3	304.9	299.0	296.3	304.9	299.0
HTVI: Townships and Residential Colonies	46.0	47.4	84.9	46.0	47.4	84.9
RESCOS (Cat-VII)	425.0	420.0	392.0	400.0	402.0	385.3
Temporary (Cat-VIII)	5.0	0.0	0.0	5.0	0.0	0.0
Sub-Total: High Tension	1662.3	1644.2	1621.6	1637.3	1626.2	1614.9
Total DISCOM Sales	6254.4	6273.6	6586.7	6295.4	6155.5	6505.8

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Table 2.7 indicates the category-wise actual sales and the proportion of these sales to total sales of APNPDCL.

Table 2.7: APNPDCL: Actual sales and trend of category-wise to total sales (MU)

Consumer Category	Actual Sales			Proportion of total		
	FY 2003-04	FY 2004-05	FY 2005-06	FY 2003-04	FY 2004-05	FY 2005-06
LT I: Domestic	1022.2	1091.4	1189.0	16.9%	17.5%	18.3%
LT II: Non-Domestic and Commercial	189.2	207.8	226.0	3.1%	3.3%	3.5%
LT III: Industry	221.5	236.4	233.0	3.7%	3.8%	3.6%
LT IV: Cottage Industries and Dobighats	4.2	4.2	4.0	0.1%	0.1%	0.1%
LT V: Agriculture	2783.5	2867.9	2941.0	46.2%	46.0%	45.4%
LT VI: Street Lighting and PWS Schemes	219.7	235.9	244.0	3.6%	3.8%	3.8%
LT VII: General Purpose	11.9	13.4	15.0	0.2%	0.2%	0.2%
LT VIII: Temporary Supply	0.3	0.1	0.0	0.0%	0.0%	0.0%
Sub-Total: Low Tension	4452.5	4657.0	4852.0	73.8%	74.7%	74.9%
HT I: Industrial – General	758.5	779.5	759.0	12.6%	12.5%	11.7%
Ferro Alloys	0.0	0.0	0.0	0.0%	0.0%	0.0%
HT II: Industrial – Others	44.8	46.0	48.0	0.7%	0.7%	0.7%
HT IV: Agriculture and Irrigation	13.7	10.2	13.0	0.2%	0.2%	0.2%
HT V: Railway Traction	299.0	295.7	296.0	5.0%	4.7%	4.6%
HTVI: Townships and Residential Colonies	61.4	89.3	141.0	1.0%	1.4%	2.2%
RESCOS (Cat-VII)	370.1	357.3	373.0	6.1%	5.7%	5.8%
Temporary (Cat-VIII)	30.8	0.0	0.0	0.5%	0.0%	0.0%
Sub-Total: High Tension	1578.3	1577.8	1630.0	26.2%	25.3%	25.1%
Total DISCOM Sales	6030.7	6234.8	6482.0	100.0%	100.0%	100.0%

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

As is evident from above, for APNPDCL, the contribution of LT sales to total sales has increased, especially for the domestic category. On the other hand, there has been a decline in proportional sales to HT category primarily due to the downtrend in industrial (general) sales, railway traction and RESCOs.

Eastern Power Distribution Company of Andhra Pradesh Limited (APEPDCL): In FY 2003-04, based on higher estimate of sales to LT Agriculture and RESCOs, the Commission approved sales of 5506.3 MU as against the licensee's projection of 5350.3 MU. In FY 2004-05, APERC approved sales of 5651.3 MU compared to sales of 5554.9 MU projected by the DISCOM. This difference can be largely attributed to the higher approved sales forecast for HT Category-I. However, in FY 2005-06, owing to the reduced sales estimate for LT agriculture category, the Commission approved sales of 6749.1 MU as against 6779.9 MU estimated by the DISCOM. A comparison of the sales projected by APEPDCL with the sales approved by APERC is presented in Table 2.8.

Table 2.8: Sales by APEPDCL: Projected and approved (MU)

<i>Consumer Category</i>	<i>Projected Sales</i>			<i>Actual Sales</i>		
	<i>FY 2003-04</i>	<i>FY 2004-05</i>	<i>FY 2005-06</i>	<i>FY 2003-04</i>	<i>FY 2004-05</i>	<i>FY 2005-06</i>
LT I: Domestic	1646.8	1636.7	1809.1	1646.8	1636.7	1809.1
LT II: Non-Domestic and Commercial	331.0	308.9	343.2	331.0	308.9	343.2
LT III: Industry	369.9	280.0	378.5	369.9	280.0	378.5
LT IV: Cottage Industries and Dobighats	1.6	1.2	1.6	1.6	1.2	1.6
LT V: Agriculture	1085.0	1150.0	1262.5	1150.0	1150.0	1231.7
LT VI: Street Lighting and PWS Schemes	126.3	156.9	195.4	126.3	156.9	195.4
LT VII: General Purpose	17.9	20.0	23.2	17.9	20.0	23.2
LT VIII: Temporary Supply	0.0	0.0	0.0	0.0	0.3	0.0
Sub-Total: Low Tension	3578.4	3553.6	4013.4	3643.4	3553.9	3982.6
HT I: Industrial – General	1112.3	1387.9	1344.1	1184.3	1483.9	1344.1
HT II: Ferro Alloys/Power Intensive			702.4			702.4
HT II: Industrial – Others	138.0	100.0	145.0	138.0	100.0	145.0
HT IV: Agriculture and Irrigation	26.1	14.6	27.6	26.1	14.6	27.6
HT V: Railway Traction	387.4	363.0	400.4	387.4	363.0	400.4
HTVI: Townships and Residential Colonies	24.0	25.9	27.0	24.0	25.9	27.0
RESCOS (Cat-VII)	83.0	110.0	118.0	102.0	110.0	120.0
Temporary (Cat-VIII)	1.0	0.0	0.0	1.0	0.0	0.0
Sub-Total: High Tension	1771.9	2001.3	2764.5	1862.8	2097.3	2766.5
Total DISCOM Sales	5350.3	5554.9	6777.9	5506.2	5651.3	6749.1

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

The trend of category-wise actual sales and change from approved sales level is highlighted in Table 2.9.

Table 2.9: APEPDCL: Actual sales and trend of category-wise to total sales

<i>Consumer Category</i>	<i>Actual Sales (MU)</i>			<i>Proportion of total</i>		
	<i>FY 2003-04</i>	<i>FY 2004-05</i>	<i>FY 2005-06</i>	<i>FY 2003-04</i>	<i>FY 2004-05</i>	<i>FY 2005-06</i>
LT I: Domestic	1558.3	1708.0	1864.0	28.5%	27.3%	27.5%
LT II: Non-Domestic and Commercial	286.6	321.0	358.0	5.2%	5.1%	5.3%
LT III: Industry	302.6	349.0	382.0	5.5%	5.6%	5.6%
LT IV: Cottage Industries and Dobighats	1.5	1.5	1.6	0.0%	0.0%	0.0%
LT V: Agriculture	1175.4	1309.0	1288.0	21.5%	20.9%	19.0%
LT VI: Street Lighting and PWS Schemes	145.1	152.0	178.0	2.7%	2.4%	2.6%
LT VII: General Purpose	19.2	21.0	23.9	0.4%	0.3%	0.4%
LT VIII: Temporary Supply	0.2	0.4	0.0	0.0%	0.0%	0.0%
Sub-Total: Low Tension	3488.9	3861.9	4095.5	63.7%	61.8%	60.4%
HT I: Industrial – General Ferro Alloys	925.5	1147.0	1416.0	16.9%	18.4%	20.9%
HT II: Industrial – Others	100.1	149.0	204.0	1.8%	2.4%	3.0%
HT IV: Agriculture and Irrigation	9.8	15.0	16.0	0.2%	0.2%	0.2%
HT V: Railway Traction	369.4	388.0	398.0	6.7%	6.2%	5.9%
HTVI: Townships and Residential Colonies	25.0	28.0	26.0	0.5%	0.4%	0.4%
RESCOS (Cat-VII)	99.3	117.0	132.0	1.8%	1.9%	1.9%
Temporary (Cat-VIII)	0.0	0.0	0.0	0.0%	0.0%	0.0%
Sub-Total: High Tension	1984.1	2388.0	2680.0	36.3%	38.2%	39.6%
Total DISCOM Sales	5473.0	6249.9	6775.5	100.0%	100.0%	100.0%

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

While LT sales have recorded a decline, the contribution of HT sales has increased over the period under study. Within the HT category, the proportional sales to industrial consumers have increased from 16.9% in FY 2003-04 to 20.9% in FY 2005-06. In the LT category, the contribution of both domestic and agricultural sales to total sales has shown a decline.

Central Power Distribution Company of Andhra Pradesh Limited (APCPDCL):

In FY 2003-04, the Commission approved a sales volume of 13772.2 MU as against the filing of 13523.6 MU, thereby affecting a higher approval of 248.6 MU. This was primarily on account of higher estimate of sales to LT-agriculture and HT-I categories and to RESCOs. For FY 2004-05, APERC approved sales of 14548 MU compared to projected sale of 14810 MU, the difference attributed to reduced approval for both LT and HT categories. Similarly, in FY 2005-06, the Commission approved lower sales (16233.5 MU) than that projected (17173.2 MU) by the DISCOM. The reduction in approved sales was primarily on account of lower Commission estimates for the LT agriculture category. The movement in projected and approved sales from FY 2003-04 to FY 2005-06 is given in Table 2.10.

Table 2.10: Sales by APCPDCL: Projected and Approved (MU)

Consumer Category	Projected Sales			Approved Sales		
	FY 2003-04	FY 2004-05	FY 2005-06	FY 2003-04	FY 2004-05	FY 2005-06
LT I: Domestic	3152.8	2968.3	3175.0	3152.8	2968.0	3175.0
LT II: Non-Domestic and Commercial	824.0	902.5	929.1	824.0	850.7	929.1
LT III: Industry	903.1	826.5	910.3	903.1	826.5	910.3
LT IV: Cottage Industries and Dobighats	11.9	12.9	18.7	11.9	12.9	18.7
LT V: Agriculture	4605.0	5249.2	6392.7	4800.0	5000.0	5453.1
LT VI: Street Lighting and PWS Schemes	269.1	370.6	576.7	269.1	452.8	576.7
LT VII: General Purpose	41.5	36.6	43.6	41.5	36.6	43.6
LT VIII: Temporary Supply	19.0	3.9	3.4	19.0	6.5	3.4
Sub-Total: Low Tension	9826.4	10370.4	12049.5	10021.4	10153.9	11109.8
HT I: Industrial – General	2673.1	3421.3	3839.0	2715.1	3380.8	3839.0
HT II: Ferro Alloys/Power Intensive			360.6			360.6
HT II: Industrial – Others	479.1	433.1	611.4	479.1	433.1	611.4
HT IV: Agriculture and Irrigation	126.6	149.8	152.3	126.6	149.8	152.3
HT V: Railway Traction	82.7	74.4	90.3	82.7	74.4	90.3
HTVI: Townships and Residential Colonies	52.4	65.9	68.5	52.4	65.9	68.5
RESCOS (Cat-VII)	278.4	295.5		278.4	290.0	
Temporary (Cat-VIII)	5.0	0.0	1.8	5.0	1.0	1.8
Sub-Total: High Tension	3697.3	4440.0	5123.7	3739.3	4395.0	5123.7
Total DISCOM Sales	13523.6	14810.4	17173.2	13760.6	14548.9	16233.5

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Table 2.11 indicates the category-wise actual sales and proportional change in the sales level from FY 2003-04 to FY 2005-06.

Table 2.11: APCPDCL: Actual sales and trend of category-wise to total sales (MU)

Consumer Category	Actual Sales			Proportion of total		
	FY 2003-04	FY 2004-05	FY 2005-06	FY 2003-04	FY 2004-05	FY 2005-06
LT I: Domestic	2660.0	2854.0	3174.0	18.7%	17.8%	18.6%
LT II: Non-Domestic and Commercial	777.0	856.0	986.0	5.5%	5.3%	5.8%
LT III: Industry	828.0	887.0	940.0	5.8%	5.5%	5.5%
LT IV: Cottage Industries and Dobighats	13.0	16.0	13.0	0.1%	0.1%	0.1%
LT V: Agriculture	5420.0	5773.0	5601.0	38.2%	35.9%	32.8%
LT VI: Street Lighting and PWS Schemes	415.0	491.0	514.0	2.9%	3.1%	3.0%
LT VII: General Purpose	37.0	40.0	45.0	0.3%	0.2%	0.3%
LT VIII: Temporary Supply	3.0	6.0	3.0	0.0%	0.0%	0.0%
Sub-Total: Low Tension	10153.0	10923.0	11276.0	71.5%	68.0%	66.0%
HT I: Industrial – General	2854.0	3647.0	4480.0	20.1%	22.7%	26.2%
Ferro Alloys	226.0	279.0	174.0	1.6%	1.7%	1.0%
HT II: Industrial – Others	437.0	558.0	660.0	3.1%	3.5%	3.9%
HT IV: Agriculture and Irrigation	72.0	169.0	187.6	0.5%	1.1%	1.1%
HT V: Railway Traction	76.0	81.0	83.9	0.5%	0.5%	0.5%
HTVI: Townships and Residential Colonies	54.0	66.0	64.0	0.4%	0.4%	0.4%
RESCOS (Cat-VII)	327.0	346.0	158.0	2.3%	2.2%	0.9%
Temporary (Cat-VIII)	1.0	4.0	0.0	0.0%	0.0%	0.0%
Sub-Total: High Tension	4047.0	5150.0	5807.5	28.5%	32.0%	34.0%
Total DISCOM Sales	14200.0	16073.0	17083.5	100.0%	100.0%	100.0%

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

For APCPDCL, LT sales as a proportion of total sales have declined from 71.5% in FY 2003-04 to 66.0% in FY 2005-06. On the contrary, the HT category sales have shown an uptrend from 28.5% in FY 2003-04 to 34% in FY 2005-06. In terms of consumer categories, the actual HT industrial sales have increased at a CAGR of 25.3%.

Southern Power Distribution Company of Andhra Pradesh Limited (APSPDCL): For FY 2003-04, APERC approved 7883.6 MU of sales as against the projected level of 7908.6 MU, thereby reflecting a marginal reduction (25.01 MU) of approved over estimated sales. However, in subsequent years, the approved sales have varied substantially from the sales forecast of APSPDCL. In FY 2004-05, the Commission approved sales of 7879.0 MU compared to projected sales of 8098.0 MU. This gap can be attributed to sales reduction across both LT and HT categories. For FY 2005-06, APSPDCL filed a sales forecast of 9479.2 MU, of which the APERC approved sales of 8953.8 MU. The gap between projected and approved sales was on account of reduction in forecasted sales for LT Agriculture category. Table 2.12 presents a review of the sales projected by APSPDCL and those approved by the Commission during the period under study.

Table 2.12: Sales by APSPDCL: Projected and Approved (MU)

<i>Consumer Category</i>	<i>Projected Sales</i>			<i>Approved Sales</i>		
	<i>FY 2003-04</i>	<i>FY 2004-05</i>	<i>FY 2005-06</i>	<i>FY 2003-04</i>	<i>FY 2004-05</i>	<i>FY 2005-06</i>
LT I: Domestic	2150.0	2171.4	2368.4	2150.0	2100.0	2368.4
LT II: Non-Domestic and Commercial	457.0	463.8	481.1	457.0	440.0	481.1
LT III: Industry	720.0	700.0	737.2	720.0	620.0	737.2
LT IV: Cottage Industries and Dobighats	15.6	19.9	21.4	15.6	17.0	21.4
LT V: Agriculture	2574.0	2600.0	3565.6	2600.0	2600.0	3053.6
LT VI: Street Lighting and PWS Schemes	165.0	205.0	296.0	165.0	235.0	296.0
LT VII: General Purpose	30.0	40.5	31.9	30.0	28.0	31.9
LT VIII: Temporary Supply	1.0	1.4	4.1	1.0	1.3	4.1
Sub-Total: Low Tension	6112.6	6202.0	7505.5	6138.6	6041.3	6993.5
HT I: Industrial – General	798.0	905.6	1149.9	798.0	895.0	1149.9
HT II: Industrial – Others	152.0	155.0	138.0	152.0	148.0	138.0
HT IV: Agriculture and Irrigation	16.0	7.0	31.8	16.0	8.0	31.8
HT V: Railway Traction	389.0	412.0	415.9	389.0	410.0	415.9
HTVI: Townships and Residential Colonies	60.0	59.8	63.9	60.0	58.0	63.9
RESCOS (Cat-VII)	380.0	356.0	174.1	329.0	319.0	160.8
Temporary (Cat-VIII)	1.0	1.0	0.0	1.0	0.0	0.0
Sub-Total: High Tension	1796.0	1896.4	1973.6	1745.0	1838.0	1960.3
Total DISCOM Sales	7908.6	8098.4	9479.2	7883.6	7879.3	8953.8

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Table 2.13 indicates the consumer category-wise actual sales and the proportion to total sales of APSPDCL.

Table 2.13: APSPDCL: Actual sales and trend of category-wise to total sales (MU)

<i>Consumer Category</i>	<i>Actual Sales</i>			<i>Proportion of total</i>		
	<i>FY 2003-04</i>	<i>FY 2004-05</i>	<i>FY 2005-06</i>	<i>FY 2003-04</i>	<i>FY 2004-05</i>	<i>FY 2005-06</i>
LT I: Domestic	1939.7	2138.1	2308.0	24.0%	23.6%	24.2%
LT II: Non-Domestic and Commercial	406.2	446.8	500.0	5.0%	4.9%	5.2%
LT III: Industry	609.9	650.4	677.0	7.5%	7.2%	7.1%
LT IV: Cottage Industries and Dobighats	16.9	19.0	22.0	0.2%	0.2%	0.2%
LT V: Agriculture	3032.1	3444.5	3454.0	37.5%	38.0%	36.2%
LT VI: Street Lighting and PWS Schemes	232.3	265.1	286.0	2.9%	2.9%	3.0%
LT VII: General Purpose	26.1	29.7	32.0	0.3%	0.3%	0.3%
LT VIII: Temporary Supply	1.2	1.8	0.0	0.0%	0.0%	0.0%
Sub-Total: Low Tension	6264.4	6995.4	7279.0	77.5%	77.2%	76.3%
HT I: Industrial – General	856.0	1073.7	1371.0	10.6%	11.9%	14.4%
Ferro Alloys	0.0	0.0	0.0	0.0%	0.0%	0.0%
HT II: Industrial – Others	134.1	137.0	162.0	1.7%	1.5%	1.7%
HT IV: Agriculture and Irrigation	7.8	18.6	33.0	0.1%	0.2%	0.3%
HT V: Railway Traction	384.5	407.8	438.0	4.8%	4.5%	4.6%
HTVI: Townships and Residential Colonies	56.1	59.4	61.0	0.7%	0.7%	0.6%
RESCOS (Cat-VII)	384.1	363.8	201.0	4.7%	4.0%	2.1%
Temporary (Cat-VIII)	0.0	0.0	0.0	0.0%	0.0%	0.0%
Sub-Total: High Tension	1822.5	2060.2	2266.0	22.5%	22.8%	23.7%
Total DISCOM Sales	8086.9	9055.6	9545.0	100.0%	100.0%	100.0%

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It is evident from above that like in the case of other DISCOMs (APCPDCL and APEPDCL) the contribution of LT sales to total has declined and that for HT category has increased.

Estimation of Agricultural sales

Prior to FY 2003-04, for estimating agricultural consumption, APERC and DISCOMs had adopted a methodology that involved identifying and metering on the LV side of Distribution Transformers (DTRs) feeding exclusively agricultural load, conducting census of pumpsets and undertaking LT line loss study. Based on this methodology, the DISCOMs estimated agricultural consumption at each Mandal level and incorporated the same in the filings for FY 2003-04. However, the Commission found these estimates to be flawed and hence engaged the Indian Statistical Institute (ISI) to study and develop a better procedure to estimate agricultural consumption. ISI estimated the consumption for sample Mandals and applied statistical techniques to estimate the agriculture consumption, which was much more than the level approved for FY 2002-03. Subsequently, the Commission directed the DISCOMs to collect monthly information from metered DTRs and file the same with the Commission by the 25th of the following month.

In the Tariff Order for FY 2004-05, APERC detailed the following procedure for estimation of agricultural consumption

- Collect monthly meter readings from circles of the DISCOM in prescribed format
- Deduct the LT line losses as per APERC categorization of DTRs to arrive at the net agricultural consumption of that particular DTR
- Add the net consumption for all metered DTRs for the particular Mandal
- Based on the above estimates, the agricultural consumption in kWh per HP is determined for that specific Mandal for the month
- Multiply the specific consumption with the total connected load (HP) to arrive at the total consumption in units for a particular Mandal
- Add the net agricultural consumption at each Mandal/Circle to arrive at the total agricultural consumption for the distribution company.

The APERC continued with the same methodology for estimating agricultural consumption in FY 2005-06. The Commission has also examined the information filed by the DISCOMs to ascertain the data quality and coverage. As an indicator of data availability, APERC has calculated the coverage ratio, i.e., the ratio of Mandals with valid meter readings to total Mandals with agricultural loads. This ratio has

declined for all DISCOMs except APNPDCL. The overall ratio is estimated to be 65.6% during the period from November 2003 to October 2004. This ratio was observed to decline to 40% when data consistency was checked for a 2-year time horizon. The Commission has computed a quality ratio, which is primarily a ratio of DTRs with valid information to total number of metered DTRs. On this account too, there has been a decline from 49.0% in FY 2002-03 to 39.0% in FY 2003-04. As the Commission viewed contemporary data as lacking in quality, it adopted consumption volumes approved for FY 2004-05 as base agricultural consumption for FY 2005-06.

Category wise sales

An analysis of sales to various categories over the period from FY 1996-97 to FY 2005-06 suggests a Compounded Annual Growth Rate (CAGR) of 6.9%. The CAGR from FY 2000-01 to FY 2005-06 is estimated to be 6.2%. The movement of overall sales (in MUs) is presented in Figure 2.1.

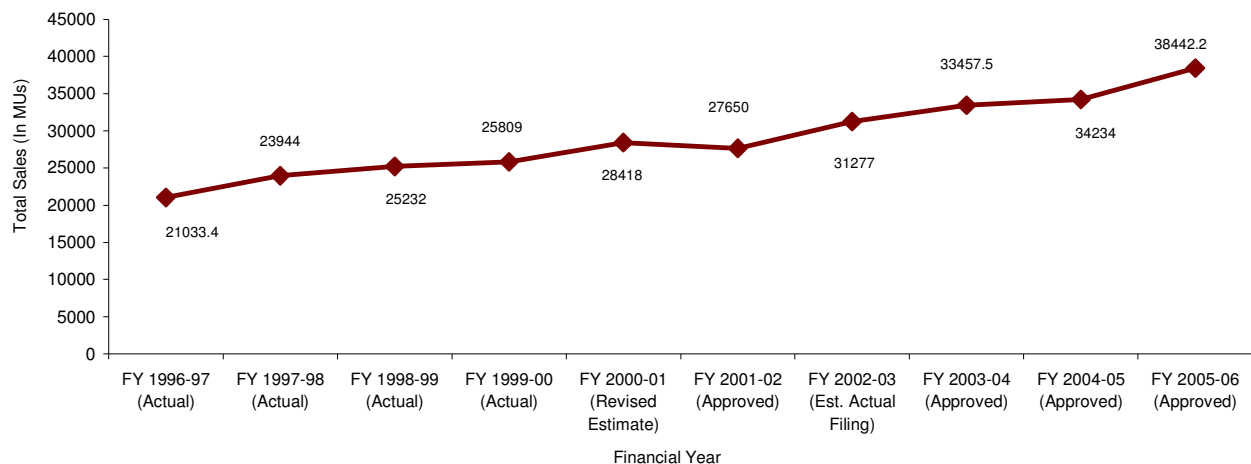


Figure 2.1: Movement of Sales (FY 1996-97 to 2005-06)

SOURCE: (1) Annual report (FY 2001-02) on the working of SEBs and Electricity Departments by Power and Energy Division- Planning Commission, GoI; (2) Tariff Orders issued by APERC (FY 2001-02 to FY 2005-06)

It may be noted that the above analysis is based on actual sales data from FY 1996-97 to FY 1999-00; revised estimates for FY 2000-01; approved sales for FY 2001-02; actual estimated filings for FY 2002-03 and approved sales from FY 2003-04 to FY 2005-06. The sub-category wise sales movement for some LT and HT categories is highlighted below:

- Domestic: Sales to this category have increased/projected to increase from 3801.0 MU in FY 1996-97 to 8597.4 MU in FY 2005-06, indicating a CAGR of 9.5% during this period. However, an analysis of CAGR in the period prior to (FY 1996-97 to FY 1999-00) and subsequent to (FY 2000-01 to

FY 2005-06) establishment of the Commission suggests a decline in sales to domestic category in the later period. While CAGR of sales in pre-APERC period was 13%, it is estimated to be 4.3% after the formation of the Commission.

- Non-Domestic/Commercial: Sales to the commercial category have increased from 795.0 MU in FY 1996-97 to 1970.4 MU in FY 2005-06 i.e. a CAGR of 10.6%. As for the domestic category, the CAGR of sales to this category has slackened from 12.9% during 1996-00 to 8.8% during 2000-06.
- Irrigation and agriculture – LT-IV: According to the Tariff Order of FY 2005-06, most of the consumption by agriculture and irrigation sub-category is unmetered. Sales to this category have increased/projected to increase from 7835.0 MU in FY 1996-97 to 12646.0 MU in FY 2005-06, reflecting a CAGR of about 5.5%.
- Industrial: Sales to industrial category is projected to increase from 6805.0 MU in FY 1996-97 to 11454.5 MU in FY 2005-06, thereby growing at a CAGR of 6.0%. However, a break-up of period from FY 1996-97 to FY 2005-06 suggests that sales grew at a CAGR of (0.09)% between FY 1996-97 to FY 1999-00 and 11.0% after FY 2000-01. This suggests a substantial increase in sales to industrial category subsequent to the establishment of APERC.

The year-on-year sales for the afore-mentioned consumer categories are depicted in Figure 2.2:

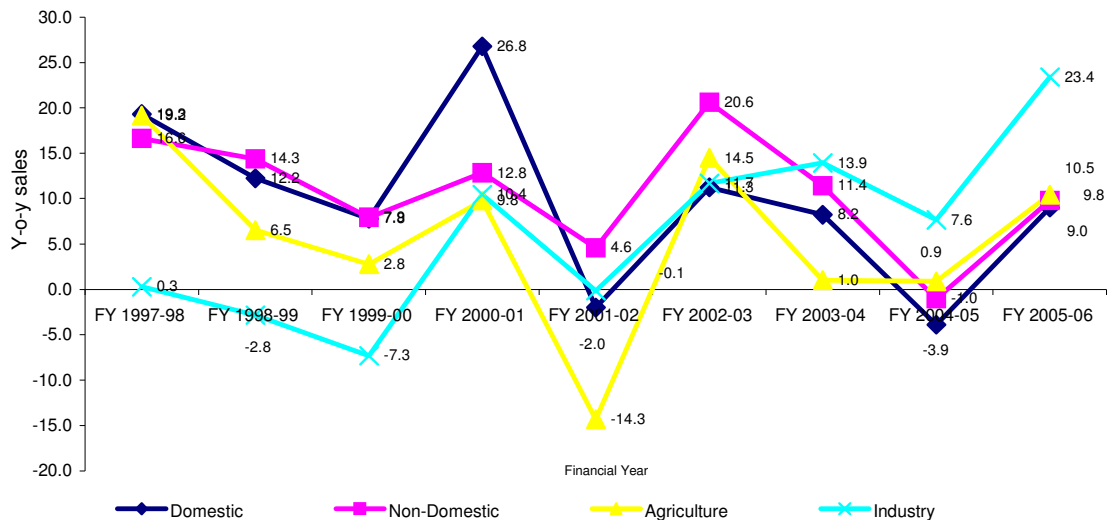


Figure 2.2: Year-on-year movement of sales (In %age)

SOURCE: Tariff Orders issued by APERC (FY 1997-98 to FY 2005-06)

Amongst the major consumer categories, agriculture contributes the highest to sales with 33.3% of total sales in FY 2005-06 made to this category. However, the contribution of agriculture to total sales has shown a decline while that of

industry (HT and LT) category has steadily increased. In FY 2005-06, the cumulative contribution of industry category to total sales was 30.1%, which was higher than 27.9% in FY 2004-05 and 25.8% in FY 2003-04.

Number of consumers and connected Load

The number of consumers in Andhra Pradesh has increased from 1.6 crore in FY 2003-04 to 1.7 crore in FY 2005-06 at a CAGR of 4.8%. About 76.3% of these consumers fall under the LT domestic category followed by 14% of the LT Agricultural consumers. On the other hand, the HT consumers formed only 0.04% of the total electricity consumer base in FY 2005-06. The category-wise number of consumers and connected load is given in Table 2.14.

Table 2.14: Category-wise number of consumers and connected load

Category	FY 2003-04			FY 2004-05			FY 2005-2006		
	Number of Consumers	Connected Load (MW)	Connected Load per Consumer	Number of Consumers	Connected Load (MW)	Connected Load per Consumer	Number of Consumers	Connected Load (MW)	Connected Load per Consumer
Low Tension									
LT I: Domestic	11956602	7880.38	0.7	12586922	8293.69	0.7	13220362	8754	0.7
LT II: Non-Domestic and Commercial	1148702	1409.66	1.2	1209442	1484.34	1.2	1268594	1787	1.4
LT III: Industry	162994	2564.31	15.7	169363	2660.91	15.7	175069	2986	17.1
LT IV: Cottage Industries and Dobighats	17578	79.61	4.5	18041	71.44	4.0	18649	74	4.0
LT V: Agriculture	2309605	8208.82	3.6	2374365	7981.37	3.4	2440823	8205	3.4
LT VI: Street Lighting and PWS Schemes	97362	541.44	5.6	101194	429.91	4.2	105855	450	4.3
LT VII: General Purpose	78525	95	1.2	82023	98.91	1.2	85232	124	1.5
LT VIII: Temporary Supply	757	0.24	0.3	830	0.25	0.3	949	0.28	0.3
Sub-Total: Low Tension	15772125	20779	1.3	16542180	21021	1.3	17315533	22380	1.3
High Tension									
HT I: Industrial - General	3266	2873.77	879.9	3552	3106.57	874.6	-	-	-
HT II: Industrial - Others	1492	295.94	198.4	1657	331.12	199.8	-	-	-
HT IV: Agriculture and Irrigation	351	141.49	403.1	376	151.79	403.7	-	-	-
HT V: Railway Traction	38	410.35	10798.7	40	426.8	10670.0	-	-	-
HTVI: Townships and Residential Colonies	0	0		0	0		-	-	-
HT VII Others	200	273.54	1367.7	217	300	1382.5	-	-	-
Sub-Total: High Tension	5347	3995	747.1	5842	4316	738.8	6392	4701.9	735.6
Grand Total (LT+HT)	15777472	24775	1.57	16548022	25337	1.53	17321925	27082	1.56

Source: Information provided by APERC

The total connected load in FY 2005-06 was 27082 MW, which has grown at a CAGR of 4.6% since FY 2003-04. During this period, the connected load for HT category increased at 8.5% compared to 3.8% for the LT category. The connected load per consumer declined from 1.57 kW/consumer in FY 2003-04 to 1.53 kW/consumer in FY 2004-05 and subsequently increased to 1.56 KW/consumer in FY 2005-06. The average consumption, measured as a ratio of actual consumption and

sales, has also shown an upward trend from FY 2003-04 to FY 2005-06.

With regard to revenue, the maximum contribution comes from the HT-industry consumers. While domestic category form 76.3% of the consumer base, its revenue contribution is only 23%. Figure 2.3 gives the contribution of major categories to overall DISCOM revenues in FY 2005-06.

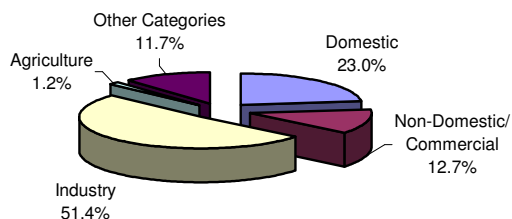


Figure 2.3: Contribution of consumer categories to revenue
SOURCE: Tariff Orders issued by APERC (FY 1997-98 to FY 2005-06)

As on March 31, 2006, the DISCOMs had a total of 62645 employees engaged in technical, non-technical and operation & maintenance (O&M) activities. Based on this figure, the revenue per consumer works to Rs. 1417897.7 crore. The corresponding ratio of revenue per thousand consumers is 3.62.

Status of Rural Electrification

Currently, electricity in rural Andhra Pradesh is not supplied 24 hours and electricity reach, particularly to households, is less than 60%²². Accordingly, as many as 5,114,485 households of 12,676,218 the rural households are un-electrified and are proposed to be given electricity access under the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGVVY). As on March 31, 2006, there was 100% electrification of towns and villages; 99.8% of the hamlets; 92.7% of dalitwadadas, 88.6% of weaker section colonies and 94.9% of the tribal habitations. The estimated cost of the RGGVY program is Rs. 800 crores to be spent in three years i.e. FY 2005-06, FY 2006-07 and FY 2007-08. The REC has already sanctioned RGGVY schemes in respect of 17 districts and the implementation work has already commenced. However, there remain certain issues in the implementation of this scheme in Andhra Pradesh, especially the lack of franchisees for rural supply.

²² Status of rural electrification in Andhra Pradesh, Rural Electrification Corporation Limited, Government of India (March 2005)

Efficiency improvement

Approach for fixing loss reduction targets

For the purpose of estimating the transmission loss level in the state, in FY 2002-03, the Commission directed APTRANSCO to conduct a study on losses observed in the EHV system, to suggest a time-bound plan for reducing such losses and to display the status of loss level on its website. In accordance with these directives, APTRANSCO conducted an in-house study that estimated the transmission losses at 7.8% for FY 2002-03. Since then, the licensee has initiated measures such as monitoring of theft of energy in EHT services, redistributing power flows from overloaded to lightly loaded feeders and adding EHT lines and substations. The reduction trend of transmission losses for FY 2003-04, FY 2004-05 and FY 2005-06 is presented in Table 2.15.

Table 2.15: Trend in Transmission Losses

FY 2003-04			FY 2004-05			FY 2005-06	
Proposed	APERC	Actual	Proposed	APERC	Actual	Proposed	APERC
7.3%	7.0%	6.5%	6.3%	6.0%	5.5%	5.0%	5.0%

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

To properly estimate the loss level on the distribution side, the Commission emphasized on the need for correct estimation of agricultural consumption based on data from the Distribution Transformer (DTR) meters. To address this issue, in Tariff Order for FY 2003-04, the Commission directed the DISCOMs to undertake an independent study to compute the technical losses in distribution (11 KV and LT) system and submit a consultation paper on the 'Achievable levels of distribution losses in the future years'. In their filings for FY 2004-05, the DISCOMs submitted estimates for distribution losses at various voltage levels. While the Commission approved these loss levels for the purpose of determining the network losses, it directed the DISCOMs to hasten the submission of the distribution loss study and the consultation paper. However, both these documents were not submitted by the DISCOMs even in their FY 2005-06 filing. The trend of distribution loss reduction for the DISCOMs is presented in Table 2.16.

Table 2.16: Reduction trend of Distribution Losses

FY 2001-02		FY 2002-03		FY 2003-04			FY 2004-05			FY 2005-06	
APERC	Actual	APERC	Actual	Proj.	APERC	Actual	Proj.	APERC	Actual	Proj.	APERC
26.0	25.4	22.2	22.1	19.0	19.0	19.8	19.2	19.2	18.5	17.4	17.2

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

The trend of DISCOM-wise losses, overall distribution losses and system losses are highlighted in Table 2.17 from FY 2003-04 to FY 2005-06.

Table 2.17: Distribution and System Losses

<i>(In %age)</i>	<i>FY 2003-04 (Actual)</i>	<i>FY 2004-05 (Actual)</i>	<i>FY 2005-06 (Proj.)</i>
APEPDCL	16.0	15.5	14.4
APCPDCL	21.0	19.2	17.9
APNPDCL	20.6	19.5	18.6
APSPDCL	19.4	18.5	17.0
Distribution losses	19.8	18.5	17.2
System losses	25.1	23.6	21.4

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

In its MYT Order for Distribution Business and Retail Supply, the Commission, based on proposals from the DISCOMs, adopted a modified methodology for computing distribution losses. The method primarily excludes the EHT sales made by the licensees. The DISCOMs have projected the distribution losses at 18.3% for FY 2006-07 as against 19.2% for FY 2005-06 (under new methodology), implying a reduction of about 0.9%. However, the Commission approved a much lower distribution loss level for each DISCOM based on anticipated investments in HVDS, system improvement schemes and quality metering proposed for the control period viz. FY 2006-07 to FY2008-09. The loss trajectory for the DISCOMs is presented in Table 2.18.

Table 2.18: Distribution loss trajectory for the control period

	<i>FY 2006-07</i>	<i>FY 2007-08</i>	<i>FY 2008-09</i>
APCPDCL	18.9%	17.1%	16.3%
APERC	18.9%	16.9%	15.9%
APEPDCL	17.1%	16.3%	15.8%
APERC	17.1%	15.8%	15.1%
APNPDCL	19.9%	18.8%	17.9%
APERC	19.9%	18.0%	17.1%
APSPDCL	17.3%	16.5%	15.7%
APERC	17.3%	15.9%	14.9%

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Collection Efficiency

The Commission's efforts towards improving the collection efficiency of DISCOMs has largely focussed on strengthening the sales database, preparing monthly Metering, Billing and Collection (MBC) Reports and requiring the regular audit of receivables and pending arrears. While the collection efficiency of the licensees is reasonably high (over 90%), the position varies for different customer categories. For instance, in FY 2003-04, the collection efficiency of agricultural category was a mere 50% on account of the GoAP directive to not collect dues from draught affected farmers. Similarly, the collection efficiency of local bodies and other government departments has been consistently low. The Commission emphasized that

such variation in collection efficiency has implications not only for revenue realization but also for working capital interest.

Further, APERC directed the licensees to correct the reporting and computing of collection efficiency, especially to address the practice of adding arrears to current demand. In this context, the Commission directed the licensees to indicate on each bill the opening balance, the arrears and current consumption charges pertaining to the bill. To check the proper implementation of these directives, the Commission, in Tariff Order for FY 2003-04, also directed the DISCOMs to file quarterly reports on arrear collection against outstanding dues and current collections against current demand. Additionally, the Commission required the licensees to progressively decentralize their metering, billing, collection and related activities. To further streamline the collection mechanism, APERC in FY 2004-05 mandated all DISCOMs to file with the Commission the list of defaulters, whose dues were more than Rs. 50,000, the reasons for non-collection and details of litigation involved.

To comply with the above directives, the DISCOMs have initiated measures to file the list of defaulters along with their ARR filing. Some measures have been initiated to make bills error-free and cross-check the billing information with the sales database. Further, the DISCOMs appointed independent firms of Chartered Accountants for audit of receivables basically to ascertain the quality of receivables and certainty of recovery. Further, for some category of consumers such as commercial/non-domestic and HT-general purpose are proposed to be shifted to a monthly billing cycle from the current system of bi-monthly billing. The trend of annual collection efficiency is highlighted in Table 2.19.

Table 2.19: Trend of collection efficiency (%age)

<i>FY 2000-01</i>	<i>FY 2001-02</i>	<i>FY 2002-03</i>	<i>FY 2003-04</i>	<i>FY 2004-05</i>
94.8%	100.6%	98.2%	92.3%	100.0%

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

While the collection efficiency has been high, the Commission has noted that this estimate might not be accurate as it includes revenue receipts of billing done in previous years.

Metering

According to estimates, only 8.8% of the distribution transformers in Andhra Pradesh are metered and most of the agricultural consumers are yet to be metered. In such a scenario, a major portion of the sale of power is considered on estimated basis. To incentivize metering of LT-agricultural consumers and facilitate out-of-turn allotment, the Commission, in its Tariff Order for FY 2003-04 introduced a

scheme under which farmers who get their pumpsets metered within 3 months of issue of tariff order could avail of a fixed metered tariff for the next three years. Further, the Commission required all DISCOMs to provide meters on a priority basis to agricultural consumers and to provide metered connections to all new agricultural consumers. However, as noted by the Commission, this scheme did not evince much participation of the agricultural consumers. The Commission also directed the DISCOMs to submit a metering plan for agricultural connections.

Apart from the directives pertaining to agricultural metering, the Commission directed all DISCOMs to include metering details such as meter reading dates, recorded and billed units etc as part of the sales database. Simultaneously, the Commission mandated that the licensees need to achieve a ratio of assessed to metered sales of 2-3%. The Commission also directed the DISCOMs to conduct a door-to-door checking of all services so as to progressively reduce multiple connections. However, on all these directives, the Commission has noted that the DISCOMs have made only limited progress. Table 2.20 presents an overview of the current status of metering in the state.

Table 2.20: Current status of metering

<i>Particulars</i>	<i>FY 1999-00 (Audited)</i>	<i>FY 2000-01 (Audited)</i>	<i>FY 2001-02 (Audited)</i>	<i>FY 2002-03 (Audited)</i>	<i>FY 2003-04 (Est.)</i>	<i>FY 2004-05 (Proj.)</i>
No. of new meters installed	-	1784508	506612	610207	609952	-
No. of Defective meters replaced	-	2218630	511846	719713	519483	-
Metered Sales	15581	16037	17247	19137	21409	22785
Agricultural Sales	10222	10692	12155	12468	11703	11450
Percentage of Metered Sales (%age)	36.9	38.4	40.9	42.5	46.7	50.9
Percentage of Agricultural Sales (%age)	24.2	25.6	28.8	27.7	25.6	25.6

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

While there has been progress in proportion of metered and agricultural sales in the post-APERC period, the rate of improvement has been tardy especially in metering agricultural consumers.

Aggregate Revenue Requirement (ARR) and its components

For FY 2003-04, the Commission approved a total ARR of Rs. 9780.8 crore as against Rs. 9773.5 crore proposed by the DISCOMs. For FY 2004-05, the DISCOMs proposed a revenue requirement of Rs. 10289.1 crore. After due evaluation of various cost items, the Commission approved an ARR of Rs. 9654.4 crore, a decline of 1.3% over the approved ARR of the previous year. For FY 2005-06, the Commission approved Rs.

10606.9 crore as revenue requirement for the licensees as against the proposed amount of Rs. 11467.3 crore. For all these financial years, the Commission has examined separately the ARR of each DISCOM. Accordingly, the current analysis initially delves into the individual components of expenditure and subsequently presents the DISCOM-wise summary of ARR proposed and approved.

Purchase of Energy

Constituting over 81.1% of the total ARR, power purchase cost is one of the most important expense items of the DISCOMs. For supplying electricity in the state, the DISCOMs till June 2005 had entered into Bulk Supply Agreements (BSA) with the APTRANSCO, which in-turn made all purchases on behalf of the DISCOMs. As regards to the energy cost for the DISCOMs, the Commission determined the total energy cost, or Bulk Supply Tariff (BST), comprising of generation cost, transmission charges and SLDC charges. While determining the BST rate for each DISCOM, the Commission considered the licensee's consumer mix, losses and cost structure while simultaneously attempting to keep the retail prices constant across the state.

In the tariff order for FY 2003-04, the Commission directed APTRANSCO to levy a two-part BST, comprising of a demand component and an energy component, on the DISCOMs. Accordingly, in its Tariff Filings for FY 2004-05, APTRANSCO filed a two-part BST with the Commission. Subsequent to the enactment of EA 2003, which restricted APTRANSCO from engaging in power purchase and in trading, the Commission recommended GoAP to vest the Power Purchase Agreements (PPAs) with the DISCOMs as well as fixed the transmission charges for all consumers who access the network. In the tariff order for FY 2005-06, pending finalisation of allocation of generation capacities to DISCOMs, the Commission approved a single-part BST for APTRANSCO. With the notification of the transfer scheme, there has been not only a change in market structure from Single-buyer model to Multi-buyer model but also a change in the cost structure of the DISCOMs. The implications of this change are fully reflected in the MYT Order for Distribution and Retail Supply Business issued by the Commission in March 2006.

The proposed and approved electricity purchases by the DISCOMs from FY 2003-04 to FY 2005-06 are summarized in Table 2.21.

Table 2.21: Purchase of Energy

Unit (MUs)	FY 2003-04		FY 2004-05		FY 2005-06	
	Projected	Approved	Projected	Approved	Projected	Approved
APEPDCL	6370.0	6555.1	5554.4	6687.9	7921.5	7888.2
APCPDCL	16375.0	17042.7	14811.2	18006.0	20919.9	19775.3
APNPDCL	7851.0	7902.9	6272.1	7646.6	8088.3	7988.4
APSPDCL	9816.0	9784.8	8098.4	9667.8	11423.5	10790.4
All DISCOMs	40412.0	41285.5	34736.1	42008.3	48353.2	46442.2
Cost of Power Purchase (In Rs. Crores)						
	Proposed	Approved	Proposed	Approved	Proposed	Approved
APEPDCL	1328.8	1356.4	1568.2	1328.3	1766.5	1558.2
APCPDCL	3490.9	3526.5	4055.6	3576.3	4368.1	3906.3
APNPDCL	1637.7	1635.2	1243.5	1518.8	1321.6	1578.0
APSPDCL	2047.6	2024.7	1959.5	1920.2	2178.5	2131.5
All DISCOMs	8505.0	8542.7	8826.8	8343.6	9634.7	9174.0
Average power purchase per unit of cost (Rs. per unit)						
APEPDCL	2.09		2.82		2.23	
APCPDCL	2.13		2.74		2.09	
APNPDCL	2.09	2.07	1.98	1.99	1.63	1.98
APSPDCL	2.09		2.42		1.91	
All DISCOMs	2.10		2.54		1.99	

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It can be observed from above tables that average per unit cost has shown a downtrend from Rs. 2.07 in FY 2003-04 to Rs. 1.98 per unit in FY 2005-06 i.e. 4.4% reduction. The various sources through which APTRANSCO has purchased power for the DISCOMs and proportion from each source is given in Table 2.22.

Table 2.22: Sources of Power Purchase

Source(s) of Power	FY 2003-04		FY 2004-05		FY 2005-06	
	Approved (MU)	Proportion of total (%)	Approved (MU)	Proportion of total (%)	Approved (MU)	Proportion of total (%)
APGENCO Thermal & Hydel	23583.0	51.5%	23250.7	50.5%	23919.4	48.9%
Central Generating Stations (CGS) - Southern Regional Pool	5921.0	12.9%	6670.0	14.5%	10070.4	20.6%
CGS: NTPC Simhadri	5662.0	12.4%	6046.0	13.1%	7446.0	15.2%
CGS: NTPC (Eastern Region)	1133.0	2.5%	332.0	0.7%	-	-
CGS: Talcher II	628.0	1.4%	1900.1	4.1%	-	-
Other SEBs	-	-	-	-	-	-
IPPs like GVK, Spectrum, Kondapalli and BSES						
Andhra	7148.0	15.6%	5677.3	12.3%	4758.9	9.7%
APGPCL	405.0	0.9%	157.7	0.3%	424.3	0.9%
Non Conventional Sources			1850.0	4.0%	2180.5	4.5%
Others	1326.0	2.9%	113.1	0.2%	87.0	
Total	45806.0		45996.7		48886.5	

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It can be observed from above that power purchase from APGENCO has declined in recent years primarily due to the failure of hydel generation caused by erratic monsoons. However, it continues to be the largest source of power purchase at 48.9% of the total in FY 2005-06. On the other hand, purchases from the CGS comprising of Southern Regional Pool, NTPC (Eastern Region) and Simhadri Power Station and Talcher Stage II increased from 29.1% to 35.8%. For power purchase from IPPs, despatch is made on the basis of least cost using merit order principles.

Employee cost

In FY 2003-04, the Commission approved the same expenditure towards 'wages, salaries and other allowances' and 'contribution to employee funds' as projected by all DISCOMs. However, owing to lower approved capital outlay vis-à-vis projections for FY 2003-04, the APERC allowed a reduced charge to capital works towards salaries (i.e. capitalization). A major portion of the amount proposed for capitalization was towards employee pensions and gratuity funds, which has been clubbed under Salaries and Wages. Further, the APERC has treated contribution to employee funds as a separate item for calculating the total expenditure, and hence, net ARR of each DISCOM. However, in our analysis, we have included this item as part of Employee Costs.

Overall, for FY 2003-04, the Commission approved the same amount towards salaries and wages as proposed by the DISCOM (i.e. Rs. 700.1 crore). In actual terms, while the employee cost for APEPDCL, APSPDCL and APNPDCL was lower than the approved, for APCPDCL the actual expense was 19.2% higher than approved. The licensee-wise projected and approved amount towards revenue requirement and actual expenditure under this head for FY 2003-04 is presented in the Table 2.23.

Table 2.23: Employee Costs for FY 2003-04

(Rs. Crores)

Particulars	APEPDCL		APCPDCL		APNPDCL		APSPDCL	
	Proposed	Approved	Proposed	Approved	Proposed	Approved	Proposed	Approved
Wages, Salaries and Allowances	118.2	118.2	210.7	210.7	126.8	126.8	178.1	178.1
Contribution to Employee Funds	12.4	12.4	17.9	21.8	13.1	13.1	19.0	19.0
Gross Employee Costs	130.6	130.6	228.6	232.4	140.0	140.0	197.1	197.1
Less: Capitalization	26.7	8.0	41.0	10.5	19.2	8.6	11.9	4.1
Net Employee Costs	103.9	122.5	187.6	221.9	120.7	131.4	185.2	193.0

All DISCOMs (FY 2003-04)	Proposed	Approved	Actual
Gross Employee Cost (Rs. Crore)	696.2	700.1	641.6

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

In FY 2004-05, while the Commission approved the same amount for employee costs as projected by APEPDCL, it approved a marginally lower amount for the other three DISCOMs. In continuance of the previous year's practice, the Commission treated 'contribution to employee funds' separately and considered capitalization out of employees' pension and gratuity funds under Salaries and Wages. However, for ease of analysis, we have continued to consider 'contribution to employee funds' under net employee costs.

For FY 2004-05, the Commission approved Rs. 785.7 crore towards employee cost of the DISCOMs as against the proposed amount of Rs. 769.5 crore. In actual terms, except for APSPDCL, all the remaining DISCOMs incurred a much higher expenditure on employee costs vis-à-vis the tariff order amount. This increase was primarily attributed to provision for Earned Leave (EL) encashment that was not envisaged in the tariff order. The provision towards EL encashment, an uncontrollable cost element allowed for true-up, was the highest for APCPDCL and was estimated at Rs. 79.5 crore. The details of net employee cost for FY 2004-05 are summarized in Table 2.24:

Table 2.24: Employee Costs for FY 2004-05

(Rs. Crores)

<i>Particulars</i>	<i>APEPDCL</i>		<i>APCPDCL</i>		<i>APNPDCL</i>		<i>APSPDCL</i>	
	<i>Proposed</i>	<i>Approved</i>	<i>Proposed</i>	<i>Approved</i>	<i>Proposed</i>	<i>Approved</i>	<i>Proposed</i>	<i>Approved</i>
Wages, Salaries and Allowances	130.4	130.4	238.0	228.9	141.8	136.9	196.0	193.8
Contribution to Employee Funds	13.4	13.4	29.0	29.0	14.7	14.7	22.4	22.4
Gross Employee Costs	143.8	143.8	267.0	257.9	156.5	151.6	218.4	216.1
Less: Capitalization	12.8	12.8	34.4	34.4	18.0	18.0	15.6	15.6
Net Employee Costs	131.0	131.1	232.6	218.1	138.5	133.6	202.8	199.0

All DISCOMs (FY 2004-05)	Proposed	Approved	Actual
Gross Employee Cost (Rs. Crore)	785.7	769.5	814.2

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

In FY 2005-06, the gross approved employee cost was 9.1% for APEPDCL, 0.2% for APCPDCL, -0.9% for APNPDCL and 5.4% for APSPDCL greater than that approved for FY 2004-05. In actual terms, employee costs for APCPDCL and APNPDCL were higher than approved figures. The details of net employee cost for the DISCOMs in FY 2005-06 are summarized in Table 2.25:

Table 2.25: Employee Costs for FY 2005-06

(Rs. Crores)

Particulars	APEPDCL		APCPDCL		APNPDCL		APSPDCL	
	Proposed	Approved	Proposed	Approved	Proposed	Approved	Proposed	Approved
Wages, Salaries and Allowances	142.6	142.6	233.8	233.8	135.9	135.9	206.4	206.4
Contribution to Employee Funds	14.2	14.3	25.6	24.6	27.0	14.3	23.2	21.4
Gross Employee Costs	156.8	157.0	259.4	258.4	162.8	150.2	229.7	227.9
Less: Capitalization	20.0	10.7	33.7	22.6	33.6	13.1	32.3	18.0
Net Employee Costs	136.9	146.2	225.7	235.8	129.2	137.1	197.4	209.9

All DISCOMs (FY 2005-06)	Proposed	Approved	Actual
Gross Employee Cost (Rs. Crore)	808.72	793.43	735.03

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

The DISCOM-wise summary of proposed, approved and actual employee costs from FY 2003-04 to FY 2005-06 is presented in Table 2.26:

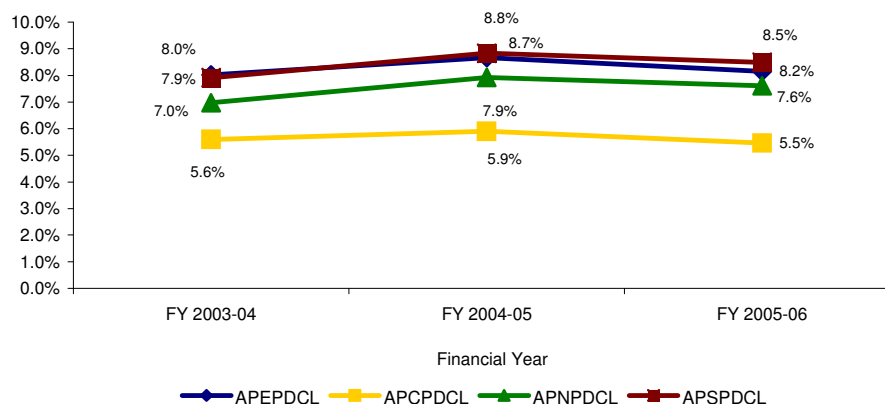
Table 2.26: Gross Employee Cost - Proposed, Approved and Actual (Rs. Crore)

	FY 2003-04			FY 2004-05			FY 2005-06		
	Proposed	Approved	Actual	Proposed	Approved	Actual	Proposed	Approved	Estimate
APEPDCL	130.6	130.6	102.2	143.8	143.8	160.5	156.8	157.0	131.4
APCPDCL	228.6	232.4	238.6	267.0	257.9	309.9	259.4	258.4	258.6
APNPDCL	140.0	140.0	130.9	156.5	151.6	174.9	162.8	150.2	154.2
APSPDCL	197.1	197.1	169.9	218.4	216.1	169.0	229.7	227.9	190.8

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Employee Productivity

To measure employee productivity, we have analyzed the employee cost as a %age of gross ARR. Figure 2.4 indicates that the employee productivity decreased marginally in FY 2004-05 for all DISCOMs and subsequently showed an upward trend in FY 2005-06.

**Figure 2.4:** Employee Cost as %age of Gross ARR (Approved)

SOURCE Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

The summary of approved and actual employee cost and productivity of expense usage is given in the Table 2.28 and Figure 2.5.

Table 2.27: Employee Costs – Approved and Actual (Rs. Crores)

	FY 2003-04	FY 2004-05	FY 2005-06
Approved	700.06	769.47	793.43
Actual	641.58	814.23	735.03

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Table 2.28: Employee Cost per unit of Sales – Approved and Actual (In Rs. Crores)

	FY 2003-04	FY 2004-05	FY 2005-06
Approved	0.21	0.22	0.21
Actual	0.19	0.24	0.19

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

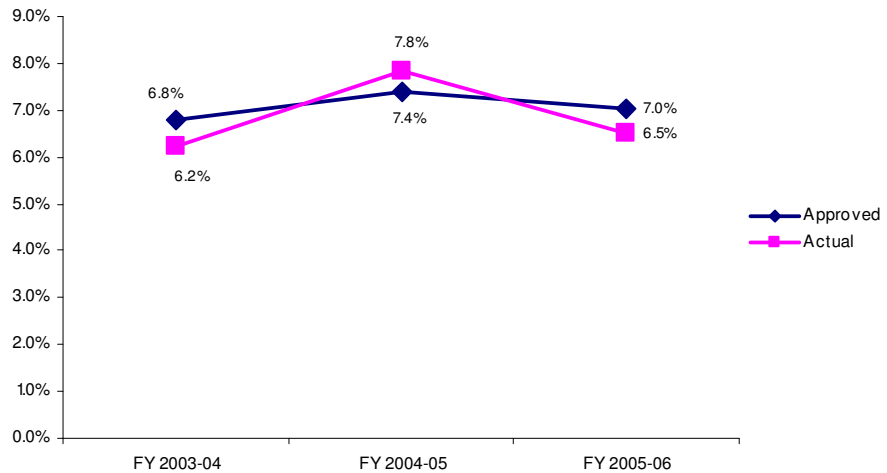


Figure 2.5: Actual and approved Employee Cost as %age of Gross ARR

SOURCE Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

For all DISCOMs, the actual employee cost has been lower than the approved amount by APERC except in FY 2004-05. It can be further observed that while the employee productivity (approved) remained almost constant, the actual productivity deteriorated in FY 2004-05 before improving in FY 2005-06.

Repair and Maintenance Expenses (R&M Expenses)

For all the three years under study viz. FY 2003-04, FY 2004-05 and FY 2005-06, APERC approved R&M expenses equivalent to the amount proposed by the licensees. The DISCOM-wise trend of proposed and actual R&M expenses is given in Table 2.29 and Figure 2.6.

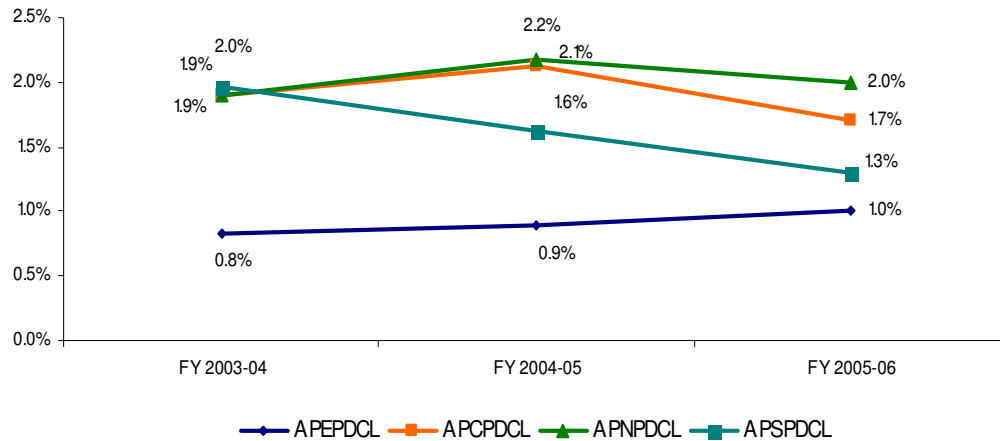
Table 2.29: Repair and Maintenance Expenses

(Rs. Crores)

	APEPDCL		APCPDCL		APNPDCL		APSPDCL	
	Proposed	Approved	Proposed	Approved	Proposed	Approved	Proposed	Approved
FY 2003-04	13.4	13.4	79.2	79.2	38.0	38.0	48.8	48.8
FY 2004-05	14.8	14.8	92.9	92.9	41.6	41.6	39.6	39.6
FY 2005-06	16.2	16.2	72.7	72.7	39.5	39.5	31.7	31.7

ALL DISCOMS (IN RS. CRORES)	Proposed	Approved	Actual
FY 2003-04	179.4	179.4	128.2
FY 2004-05	188.8	188.8	125.1
FY 2005-06	160.1	160.1	144.7

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

**Figure 2.6:** R&M Expenses as %age of Gross ARR

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It is evident from above that R&M expenses of APCPDCL are not only higher than the other DISCOMs in absolute terms but also greater as a proportion of the gross ARR in FY 2003-04 and FY 2004-05.

Table 2.30 highlights the R&M expenditure as a percentage of the opening gross fixed asset over the years (approved figures).

Table 2.30: Repair & maintenance expenses as a percentage of Gross Fixed Assets (%)

Financial Year	APEPDCL	APCPDCL	APNPDCL	APSPDCL
FY 2003-04	1.64%	3.83%	3.79%	3.71%
FY 2004-05	1.45%	3.72%	3.47%	2.64%
FY 2005-06	1.19%	3.50%	2.93%	1.69%

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

From above, it can be observed that the R&M expenses as proportion of the gross GFA has declined for all DISCOMs from FY 2003-04 to FY 2005-06.

To summarize, Table 2.31 indicate the approved and actual R&M expenses from FY 2003-04 to FY 2005-06.

Table 2.31: Approved and actual R&M expenses (Rs. Crores)

R&M Expenses	FY 2003-04	FY 2004-05	FY 2005-06
Approved	179.4	188.8	160.1
Actual	128.2	125.1	144.7

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It is observed from the above that actual R&M expenses have been consistently lower than the approved amount for the DISCOMs. Figure 2.6 and Table 2.32 gives the proportion of R&M in gross ARR and GFA for all DISCOMs.

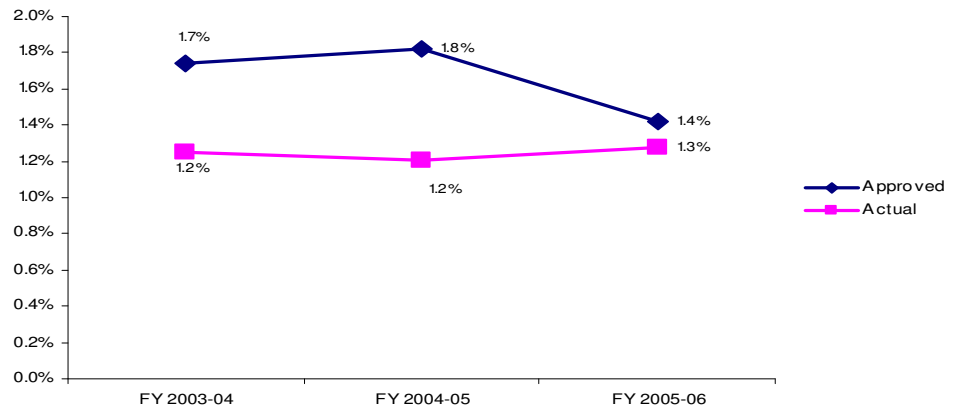


Figure 2.6: Actual and approved R&M expense as %age of Gross ARR

SOURCE: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Table 2.32: R&M as %age of Gross Fixed Assets (%age)

R&M Expenses	FY 2003-04	FY 2004-05	FY 2005-06
Approved	3.4%	3.0%	2.4%
Actual	2.5%	2.0%	2.2%

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Administration and General (A&G) Expenses

While determining the ARR, APERC reviews the A&G cost with reference to the past trends and the size of the business.

Thereafter, the expenditure to be capitalized is deducted from the gross amount and the net figure is considered in the ARR. The Commission considers this expense as a controllable item for purposes of true-up. It is worth noting that the expenditure statement of the DISCOMs, apart from reporting A&G expenses,

includes items such as Rent, Rates and Taxes, Legal charges and Audit & other fees separately. As these items are generally included in A&G expenses for regulatory accounting purposes, we have clubbed them in the analysis presented below.

In FY 2003-04, APERC approved the same amount of A&G expenses as projected by the DISCOMs. However, the actual A&G expense was 13.9% greater than the approved amount with major deviations in APEPDCL and APCPDCL. The DISCOM-wise proposed and approved figures and the actual figures for all licensees are summarized in Table 2.33.

Table 2.33: Administrative and General Expenses for FY 2003-04

(Rs. Crores)

Particulars	APEPDCL		APCPDCL		APNPDCL		APSPDCL	
	Proposed	Approved	Proposed	Approved	Proposed	Approved	Proposed	Approved
Gross A&G	15.0	15.0	39.8	39.8	21.2	21.2	25.5	25.5
Rent, Rate and Taxes	0.6	0.6	1.2	1.2	1.4	1.4	1.6	1.6
Legal Charges	5.0	5.0	8.5	8.5	0.1	0.1	6.3	6.3
Audit & Other fees	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sub-Total: A&G Expenses	20.6	20.6	49.4	49.4	22.7	22.7	33.4	33.4
Capitalization	3.1	3.1	7.0	7.0	2.9	2.9	1.5	1.5
Net A&G Expenses	17.6	17.6	42.4	42.4	19.8	19.8	31.8	31.8

All DISCOMs (FY 2003-04)	Proposed	Approved	Actual
Gross A&G Expenses (Rs. Crores)	126.1	126.1	143.6

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

In FY 2004-05, while the Commission approved the same amount of A&G expenses as claimed by APEPDCL, APNPDCL and APSPDCL, it approved a marginally lower amount for APCPDCL. This was on account of exclusion of **e-Seva cost** of Rs. 2.3 crore, which the Commission believed could be recovered through customer charges levied by the licensee. In actual terms, the four DISCOMs incurred A&G expenses of Rs. 147.6 crores, which was 7.0% lower than the approved amount. A summary of A&G expenditure of the DISCOMs is presented in Table 2.34.

Table 2.34: Administrative and General Expenses for FY 2004-05

(Rs. Crores)

Particulars	APEPDCL		APCPDCL		APNPDCL		APSPDCL	
	Proposed	Approved	Proposed	Approved	Proposed	Approved	Proposed	Approved
Gross A&G	24.9	24.9	43.2	40.9	16.4	16.4	26.4	26.4
Rent, Rate and Taxes	7.4	7.4	5.0	5.0	2.9	2.9	4.0	4.0
Legal Charges	0.1	0.1	13.6	13.6	8.3	8.3	8.5	8.5
Audit & Other fees	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
Sub-Total: A&G Expenses	32.4	32.4	61.8	59.5	27.7	27.7	39.0	39.0
Capitalization	2.2	2.2	5.6	5.6	1.9	1.9	1.9	1.9
Net A&G Expenses	30.2	30.2	56.2	54.0	25.8	25.8	37.1	37.1

All DISCOMs (FY 2004-05)	Proposed	Approved	Actual
Gross A&G Expenses (Rs. Crore)	160.9	158.6	147.6

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

For FY 2005-06, while the Commission approved a lower amount than proposed, it has not specified any reason for this lower allocation. During this year, the actual amount spent on A&G expenses was 6.7% higher than that approved for the licensees. The maximum variation between the approved and actual amounts was in APEPDCL, where the latter was about 16.1% greater than the former. The trend of A&G expenditure for the DISCOMs from FY 2003-04 to FY 2005-06 is presented in Table 2.35.

Table 2.35: Administrative and General Expenses for FY 2005-06 (Rs. Crores)

Particulars	APEPDCL		APCPDCL		APNPDCL		APSPDCL	
	Proposed	Approved	Proposed	Approved	Proposed	Approved	Proposed	Approved
Rent, Rate and Taxes	7.6	7.6	8.5	8.5	1.8	1.8	1.1	1.1
Legal Charges	0.1	0.1	12.4	12.4	11.0	11.0	10.0	10.0
Audit & Other fees	0.0	0.0	0.1	0.1	0.0	0.0	0.3	0.3
A&G Expenses	33.1	29.5	67.1	63.6	25.3	23.2	36.8	35.3

All DISCOMs (FY 2005-06)	Proposed	Approved	Actual
Gross A&G Expenses (Rs. Crores)	162.3	151.5	161.6

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

The DISCOM-wise summary of proposed, approved and actual Gross A&G costs from FY 2003-04 to FY 2005-06 is presented in Table 2.36

Table 2.36: A&G Expenses (Net of capitalization) - Proposed, Approved and Actual (Rs. Crore)

	FY 2003-04			FY 2004-05			FY 2005-06		
	Proposed	Approved	Actual	Proposed	Approved	Actual	Proposed	Approved	Estimate
APEPDCL	17.6	17.6	24.4	30.2	30.2	27.1	33.1	29.5	34.3
APCPDCL	42.4	42.4	62.1	56.2	54.0	61.1	67.1	63.6	63.6
APNPDCL	19.8	19.8	22.6	25.8	25.8	24.1	25.3	23.2	25.3
APSPDCL	31.8	31.8	34.6	37.1	39.0	35.4	36.8	35.3	38.4

Figure 2.7 and Figure 2.8 indicate A&G expenses as a percentage of sales and of ARR. It is evident that on both these parameters, the DISCOMs have performed better in FY 2005-06 vis-à-vis the previous financial year.

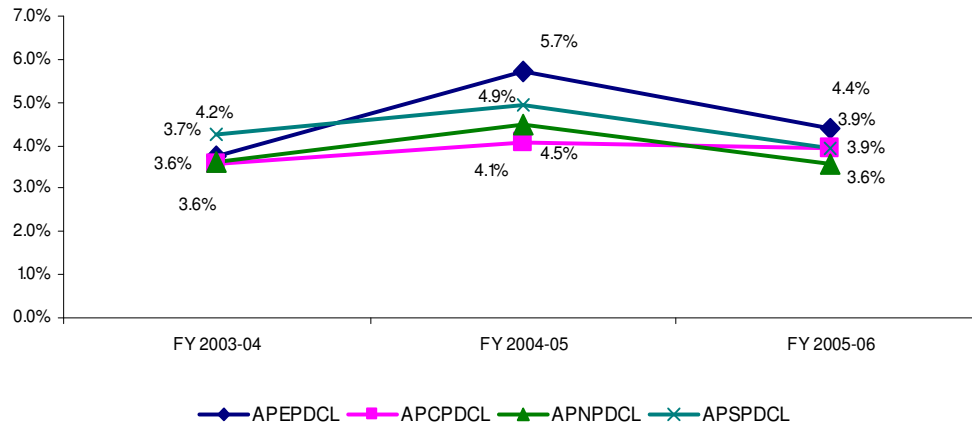


Figure 2.7: A&G Expenses as %age of Sales (Approved)

SOURCE Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

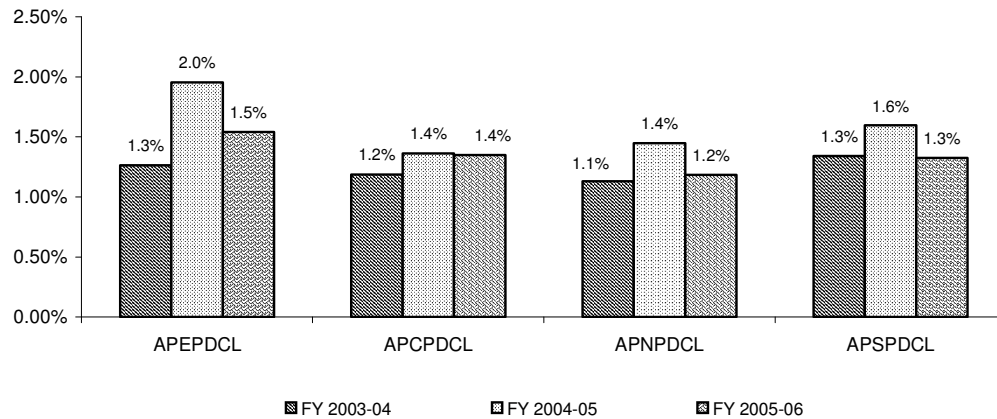


Figure 2.8: A&G as %age of Gross ARR

SOURCE Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

The approved and actual A&G expenses and productivity for all DISCOMs are summarized in Table 2.37 and Table 2.38

Table 2.37: Approved and Actual A&G Expenses (Rs. Crores)

	FY 2003-04	FY 2004-05	FY 2005-06
Approved	126.1	158.6	151.5
Actual	143.6	147.6	161.6

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Table 2.38: A&G Productivity - Approved and Actual

A&G Expenses as %age of Gross ARR (%age)			
	FY 2003-04	FY 2004-05	FY 2005-06
Approved	1.23%	1.53%	1.34%
Actual	1.40%	1.42%	1.43%
A&G/Sales (In Rs./kWh)			
Approved	0.038	0.046	0.039
Actual	0.043	0.043	0.042

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

From the above, it is evident that except for FY 2004-05, the actual A&G expenses of the DISCOMs have been higher than the approved amount. However, in actual terms, the A&G expense productivity has remained static for this period.

Total Operating Expenses (Employee Costs, A&G and R&M Expenses)

The O&M cost primarily consists of three heads viz. employee costs, R&M and A&G expenses. Table 2.39 gives the trend of O&M expenditure from FY 2003-04 to FY 2005-06.

Table 2.39: Trend of O&M Expenses

	Proposed	Approved	Actual	Per unit of sale	%age of Gross ARR
	Rs. Crore			Rs/kWh	%
FY 2003-04	1001.7	1005.5	913.4	30.1	9.8
FY 2004-05	1135.3	1116.9	1086.9	32.6	10.8
FY 2005-06	1131.1	1105.0	1041.4	28.7	9.8

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It is evident from above that actual O&M expenses have been largely in consonance with the approved amounts. Further, O&M expense per unit of sales and as a percentage of total ARR has decreased in FY 2005-06, after an increase in FY 2004-05. For the control period from FY 2006-07 to FY 2008-09, the Commission has required the DISCOMs to submit composite proposals for determining O&M expenses allowable towards ARR for each year by using pre-determined norms/formulae.

Depreciation

In its various Tariff Orders, the Commission has estimated depreciation on gross fixed assets at the rates prescribed by the Ministry of Power (MoP) from time to time. Even in the MYT Order, APERC has preferred to retain the MoP depreciation rates rather than adopting the rates (depreciation plus advance against depreciation) in accordance with provisions of CERC Regulation on 'Terms and Conditions of Tariff issues' (March 2004) or adopting an ad-hoc arrangement pending the notification of the rates for distribution by the Forum of Regulators (FOR) under the Tariff Policy. On the regulatory

treatment mechanism, the Commission has considered depreciation as a controllable item with true-up linked to the capitalization of works. Similarly, the Commission does not treat Debt Redemption Obligation, the difference between actual asset value and total depreciation, as a pass-through.

The Commission in its orders for FY 2003-04, FY 2004-05 and FY 2005-06 approved a lower level of depreciation than that proposed primarily on account of the lower amount reckoned under OCFA in capital base of the DISCOMs. This resulted in lower approved level of capitalization and hence lesser amount towards depreciation expenses. Table 2.40 presents the proposed and actual amounts for depreciation from FY 2003-04 to FY 2005-06.

Table 2.40: Proposed, Approved and Actual Depreciation Expenses (Rs. Crores)

	<i>Depreciation Expenses</i>							
	<i>APEPDCL</i>		<i>APCPDCL</i>		<i>APNPDCL</i>		<i>APSPDCL</i>	
	<i>Proposed</i>	<i>Approved</i>	<i>Proposed</i>	<i>Approved</i>	<i>Proposed</i>	<i>Approved</i>	<i>Proposed</i>	<i>Approved</i>
FY 2003-04	60.9	57.3	155.4	137.3	74.0	71.6	102.8	90.5
FY 2004-05	78.6	70.6	149.2	143.9	74.1	69.6	118.9	110.3
FY 2005-06	95.3	90.2	184.9	178.8	90.8	86.4	141.6	136.5

	APEPDCL	APCPDCL	APNPDCL	APSPDCL
FY 2003-04	51.9	129.3	63.2	99.2
FY 2004-05	93.9	158.8	76.1	116.1
FY 2005-06	125.9	165.7	85.3	146.8

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Sources of Funds

Accelerated Power Development & Reforms Program (APDRP)

A total of 101 projects with a cost of Rs. 1458.5 crore have been sanctioned under the APDRP scheme in the state. APCPDCL has the maximum number of sanctioned projects (35) followed by APSPDCL (23), APEPDCL (21) and APNPDCL (19). The DISCOM-wise progress of APDRP projects is given in Table 2.41.

Table 2.41: Progress of APDRP Projects

DISCOM	Project Cost (In Rs. Crores)	% age of work completed	Utilization upto March 2005 (Rs. Crores)	Utilization during FY 2005-06 (Rs. Crores)	Total Utilization upto March 2006 (Rs. Crores)
APEPDCL	357.0	63.0%	167.0	56.0	226.0
APCPDCL	518.4	53.0%	248.0	26.3	274.3
APNPDCL	174.6	83.0%	112.2	33.3	145.6
APSPDCL	373.5	84.0%	310.6	1.4	312.1

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It is evident from above that work under APNPDCL and APSPDCL has been completed substantially (above 80%), the

work under APEPDCL and APCPDCL is far from completed. In addition to the investment component of APDRP as mentioned above, the DISCOMs are eligible for an incentive component of Rs. 265.1 crore on reduction of cash loss of Rs. 530.2 crores. The GoI released this incentive amount to the GOAP during FY 2003-04 for transfer to the DISCOMs.

High Voltage Distribution System (HVDS) Scheme

In FY 2005-06, GoAP initiated the HVDS scheme with a total planned investment of Rs. 5500 Crore by the DISCOMs for projects to be completed by 2007. This scheme broadly aims to take the HT lines closer to the end-consumers by providing small capacity DTRs. Its objectives are to reduce unauthorized tappings, improve voltage profile, minimize DTR failures, augment reliability of supply and reduce overall LT losses, besides inculcating an ownership attitude among the farmers by limiting the number of connections to 3-5 on small capacity DTRs.

Status of PFC lending²³

The status of PFC lending in Andhra Pradesh as on October 5, 2006 is given in Table 2.42.

Table 2.42: Status of PFC lending (Rs. Crores)

Utility	Total Sanction	Total disbursement
APERC	0.07	0.07
Power Generation Corporation of Andhra Pradesh	5617.0	4243.4
APEPDCL	253.7	78.7
APCPDCL	409.1	77.0
APNPDCL	34.5	-
APSPDCL	80.3	-
APTRANSCO	2733.6	1561.5
B. Seenaiiah and Company (Projects)	7.0	7.0
Clarion Power Corporation	23.5	23.5
Gautami Power	290.0	260.3
IMP Power	5.9	6.8
Indur Green Power	9.8	9.8
Konanseema Gas Power	275.0	243.1
Lanco Kondapalli Power	223.6	223.6
Om Shakti Renergies	10.0	10.0
Perpetual Energy Systems	9.9	9.9
Total – Andhra Pradesh	9983.0	6754.6
Total PFC Funding to all States	112640.8	67652.4
%age of total PFC funding	8.9%	10.0%

Source: PowerLine Volume 11, No. 2, October 2006

In addition to the above, in the past, the state has received long-term loans/grants from the Department for International Development (DFID), World Bank and Overseas Economic Co-operation Fund (OECF) for improvement of transmission and distribution system.

²³ Power Line, Volume 11, No. 2, October 2006

Interest and Finance Charges

The amount towards 'interest on loans' corresponds to loans taken in the capital base and is worked out on the basis of rates on loans filed by the DISCOMs for the current and ensuing year. Lease rentals and other finance charges such as discounts/incentives to consumers are also included under this component. Further, the Commission provides for interest on average security deposits at the prevailing bank rate and takes the same to the ARR. Table 2.43 shows the proposed and approved expenditure on interest on loans and consumer security deposits.

Table 2.43 Interest on Approved Loan and Security Deposits (Rs. Crores)

	APEPDCL		APCPDCL		APNPDCL		APSPDCL	
	Proposed	Approved	Proposed	Approved	Proposed	Approved	Proposed	Approved
FY 2003-04	51.8	51.4	181.8	130.2	86.4	78.3	89.2	82.0
FY 2004-05	66.2	68.3	199.0	181.7	90.0	81.0	103.2	100.6
FY 2005-06	86.3	68.5	295.1	236.7	119.2	98.5	124.4	102.2

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

On the overall, interest expense of the DISCOMs has risen from Rs. 341.9 crore in FY 2003-04 to Rs. 505.0 crore in FY 2005-06, indicating a CAGR of 21.7%. Amongst the DISCOMs, interest expenses have increased most for APCPDCL at a CAGR of 34.8%.

Provision for Bad Debt

In the Tariff filings for FY 2004-05, the DISCOMs proposed an amount of Rs. 82.9 crore, equivalent to 1% of the revenues, towards bad and doubtful debt. The Commission disapproved this allocation for ARR stating that, according to the Electricity (Supply) Annual Accounts Rules 1985, the provision for doubtful dues from consumers must be a fixed percentage of the outstanding dues rather than that of gross revenue. Further, the Commission deemed such provision justified only after the DISCOMs conducted an audit of their receivables and utilized the amount made available under the first (finalized) transfer scheme. Subsequently, no such allocation was made for bad debts in Tariff Order for FY 2005-06.

Rate of Return

In the Tariff Orders for FY 2003-04, FY 2004-05 and FY 2005-06, the DISCOMs have not claimed any reasonable return, primarily on the justification that the utilities are under public ownership. However, the Commission viewed that the licensees are eligible for a reasonable return as per the Sixth Schedule of the Electricity (Supply) Act 1948. As return is considered an uncontrollable item under the pass-through mechanism, the Commission has included return as part of the Special

Appropriations in each financial year. The Commission has calculated the return at 16% on net capital base and 0.50% on the approved loans taken to the Capital Base of licensees.

Other Expenses and Special Appropriations

While expenses of a non-recurring or miscellaneous nature are reported as 'Other Expenses', those allowed to pass-through in the ARR as adjustments pertaining to the previous years and contribution of DISCOMs towards a Contingency Fund are reported as 'Special Appropriations'. The expense allocation under 'contributions to contingencies reserves' is calculated at 0.25% of the Original Cost of Fixed Assets (OCFA) and this amount is required to be invested in securities under the Indian Trusts Act 1882 within a period of six months.

In the Tariff Order for FY 2003-04, other expenses included corporate allocation made by APTRANSCO to the DISCOMs. However, no expenses were accounted under this head in FY 2004-05 and FY 2005-06.

In the ARR calculation for FY 2003-04, the Commission made special appropriation for adjusting pay revision arrears, interest adjustments due to shortfall in capital outlay and carrying cost for wheeling compensation incurred in FY 2002-03. Similarly, in Tariff Order for FY 2004-05, the Commission included adjustments for interest, depreciation and income tax variations and reasonable return for FY 2000-01, FY 2001-02 and FY 2002-03. In determining the revenue requirement for FY 2005-06, APERC included an appropriation for depreciation, interest and reasonable return in FY 2003-04. Table 2.44 shows a comparison of proposed and approved expenses under this head.

Table 2.44: Other expenses and Special appropriations

(Rs. Crores)

	APEPDCL		APCPDCL		APNPDCL		APSPDCL	
	Proposed	Approved	Proposed	Approved	Proposed	Approved	Proposed	Approved
FY 2003-04								
Other Expenses	5.9	6.5	14.9	11.8	8.7	6.5	10.1	7.8
Special Appropriations	2.6	-8.1	6.4	-9.4	2.8	14.7	3.8	5.6
Sub-Total	8.5	-1.6	21.2	2.5	11.5	21.2	13.9	13.3
FY 2004-05								
Other Expenses	-	-	-	-	-	-	-0.3	-
Special Appropriations	3.0	-0.8	7.2	57.0	21.7	23.3	4.2	19.1
Sub-Total	3.0	-0.8	7.2	57.0	21.7	23.3	3.9	19.1
FY 2005-06								
Other Expenses	-	-	-	-	-	-	6.3	-
Special Appropriations	3.5	4.9	8.6	13.2	5.0	-2.7	5.2	17.5
Sub-Total	3.5	4.9	8.6	13.2	5.0	-2.7	11.4	17.5

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Total ARR of the DISCOMs

Table 2.45 presents a DISCOM-wise analysis of the various components of the ARR (proposed and approved) as well as the actual revenue gap and ARR from FY 2003-04 to FY 2005-06.

Table 2.45: Aggregate Revenue Requirement – APEPDCL (Rs. Crores)

	FY 2003-04		FY 2004-05		FY 2005-06	
	Proposed	Approved	Proposed	Approved	Proposed	Approved
Purchase of Energy	1328.8	1356.4	1568.2	1328.3	1766.5	1558.2
Employee Cost (Wages & Salaries and Contribution to Employee Funds)	130.6	130.6	143.8	143.8	156.8	157.0
A&G Expenses (Including rent, rates and taxes; legal changes; audit and other fees)	20.6	20.6	32.4	32.4	33.1	29.5
R&M Expenses	13.4	13.4	14.8	14.8	16.2	16.2
Interest on approved loan and Security Deposits	51.8	51.4	66.2	68.3	86.3	68.5
Depreciation	60.9	57.3	78.6	70.6	95.3	90.2
Other Expenses and Special Appropriations	8.5	-1.6	3.0	-0.8	3.5	4.9
Provision for Doubtful Debts	-	-	15.4	-	-	-
Gross ARR	1614.5	1628.1	1922.3	1657.4	2157.8	1924.5
Less: capitalization	29.7	11.1	15.0	15.0	20.0	10.7
Less: Non-Tariff Income	77.7	80.9	67.9	67.9	79.1	79.1
Add: Reasonable Return	-	1.9	-	3.3	-	1.6
Total Net ARR	1507.0	1538.0	1839.4	1577.8	2058.7	1836.2
Less: Efficiency Gains	-	20.0	-	8.0	-	6.0
Less: Revenue from Tariffs	1501.8	1513.9	1537.2	1536.6	1821.5	1862.4
Net Revenue Gap	5.3	4.1	302.2	33.2	237.2	-32.2

	Net ARR and Revenue Gap - APEPDCL							
	FY 2003-04		FY 2004-05		FY 2005-06			
	Proposed	Approved	Proposed	Approved	Actual	Proposed	Approved	Actual
Total Net ARR	1507.0	1538.0	1839.4	1577.8	1976.1	2058.7	1836.2	2111.9
Net Revenue Gap	5.2	4.1	302.2	33.2	179.0	237.2	-32.2	93.4

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

The actual net ARR for APCPDCL was 25.2% and 15.0% greater than the approved amount for FY 2004-05 and FY 2005-06 respectively. Similarly, the actual revenue gap varied substantially from the approved amount for both the years.

Table 2.46: Aggregate Revenue Requirement – APCPDCL (Rs. Crores)

	FY 2003-04		FY 2004-05		FY 2005-06	
	Proposed	Approved	Proposed	Approved	Proposed	Approved
Purchase of Energy	3490.9	3526.5	4055.6	3576.3	4368.1	3906.3
Employee Cost (Wages & Salaries and Contribution to Employee Funds)	228.6	232.4	267.0	257.9	259.4	258.4
A&G Expenses (Including rent, rates and taxes; legal changes; audit and other fees)	49.4	49.4	61.8	59.5	67.1	63.6
R&M Expenses	79.2	79.2	92.9	92.9	72.7	72.7
Interest on approved loan and Security Deposits	181.8	130.2	199.0	181.7	295.1	236.7
Depreciation	155.4	137.3	149.2	143.9	184.9	178.8
Other Expenses and Special Appropriations	21.2	2.5	7.2	57.0	8.6	13.2
Provision for Doubtful Debts	-	-	37.1	-	-	-
Gross ARR	4206.6	4157.5	4869.8	4369.2	5255.9	4729.8
Less: Capitalization	48.0	17.5	40.0	45.3	33.7	22.6
Less: Non-Tariff Income	200.4	193.2	259.3	300.1	307.6	306.6
Add: Reasonable Return	-	11.4	-	11.7	-	6.1
Total Net ARR	3958.1	3958.2	4570.5	4035.5	4914.6	4406.6
Less: Efficiency Gains	-	139.0	-	157.0	-	60.0
Less: Revenue from Tariffs	3529.0	3486.9	3705.7	3596.6	3981.2	4042.0
Net Revenue Gap	429.1	332.2	864.8	281.8	933.5	304.7

	Net ARR and Revenue Gap – APCPDCL							
	FY 2003-04		FY 2004-05		FY 2005-06			Actual
	Proposed	Approved	Proposed	Approved	Proposed	Approved	Actual	
Total Net ARR	3958.1	3958.2	4570.5	4035.5	4914.6	4406.6	4888.9	
Net Revenue Gap	429.1	332.2	864.8	281.8	933.5	304.7	251.6	

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

During FY 2004-05 and FY 2005-06, the actual ARR for APCPDCL was 21.6% and 10.9% over the approved amount. While in FY 2004-05, the actual revenue gap was 65.9% greater than the approved, in FY 2005-06, the actual was 17.4% less than the approved gap.

Table 2.47: Aggregate Revenue Requirement – APNPDCL (Rs. Crores)

	FY 2003-04		FY 2004-05		FY 2005-06	
	Proposed	Approved	Proposed	Approved	Proposed	Approved
Purchase of Energy	1637.7	1635.2	1243.5	1518.8	1321.6	1578.0
Employee Cost (Wages & Salaries and Contribution to Employee Funds)	140.0	140.0	156.5	151.6	162.8	150.2
A&G Expenses (Including rent, rates and taxes; legal changes; audit and other fees)	22.7	22.7	27.7	27.7	25.3	23.2
R&M Expenses	38.0	38.0	41.6	41.6	39.5	39.5
Interest on approved loan and	86.4	78.3	90.0	81.0	119.2	98.5

Security Deposits						
Depreciation	74.0	71.6	74.1	69.6	90.8	86.4
Other Expenses and Special Appropriations	11.5	21.2	21.7	23.3	5.0	-2.7
Provision for Doubtful Debts	-	-	11.6	-	-	-
Gross ARR	2010.2	2007.0	1666.8	1913.5	1764.2	1973.1
	22.2					
Less: Capitalization		11.5	19.9	19.9	33.6	13.1
Less: Non-Tariff Income	94.4	96.0	113.3	113.9	138.3	138.3
Plus: Reasonable Return	-	2.7	-	3.3	-	3.2
Total Net ARR	1893.6	1902.2	1533.5	1783.0	1592.3	1824.9
Less: Efficiency Gains	-	54.0	-	60.0	-	28.0
Less: Revenue from Tariffs	1143.1	1167.6	1162.9	1142.7	1073.9	1076.0
Net Revenue Gap	750.4	680.6	370.6	580.2	518.4	720.9

	Net ARR and Revenue Gap - APNPDCCL							
	FY 2003-04		FY 2004-05			FY 2005-06		
	Proposed	Approved	Proposed	Approved	Actual	Proposed	Approved	Actual
Total Net ARR	1893.6	1902.2	1533.5	1783.0	1606.9	1592.3	1824.9	1882.6
Net Revenue Gap	750.4	680.6	370.6	580.2	307.2	518.4	720.9	631.3

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

In FY 2004-05, the actual ARR and revenue gap for APNPDCCL were below the approved amount by 9.9% and 47.1% respectively. In FY 2005-06, while the actual ARR was 3.2% greater than that approved, the actual revenue gap was 12.4% below the approved amount.

Table 2.48: Aggregate Revenue Requirement – ASPDCCL (Rs. Crores)

	FY 2003-04		FY 2004-05		FY 2005-06	
	Proposed	Approved	Proposed	Approved	Proposed	Approved
Purchase of Energy	2047.6	2024.7	1959.5	1920.2	2178.5	2131.5
Employee Cost (Wages & Salaries and Contribution to Employee Funds)	197.1	197.1	218.4	216.1	229.7	227.9
A&G Expenses (Including rent, rates and taxes; legal changes; audit and other fees)	33.4	33.4	39.0	39.0	36.8	35.3
R&M Expenses	48.8	48.8	39.6	39.6	31.7	31.7
Interest on approved loan and Security Deposits	89.2	82.0	103.2	100.6	124.4	102.2
Depreciation	102.8	90.5	118.9	110.3	141.6	136.5
Other Expenses and Special Appropriations	13.9	13.3	3.9	19.1	11.4	17.5
Provision for Doubtful Debts	-	-	18.9	-	-	-
Gross ARR	2532.7	2489.7	2501.4	2444.9	2754.0	2682.6
Less: Capitalization	13.5	5.7	17.5	19.0	32.4	18.0
Less: Non-Tariff Income	-	1.7	-	2.9	-	2.3
Add: Reasonable Return	108.3	103.3	138.0	147.2	127.7	127.7
Total Net ARR	2411.0	2382.5	2345.9	2281.5	2593.9	2539.2
Less: Efficiency Gains	-	82.0	-	75.0	-	31.0
Less: Revenue from Tariffs	1812.3	1803.9	1887.4	1795.9	1886.8	1902.1
Net Revenue Gap	598.7	496.6	458.5	410.7	707.1	606.1

	Net ARR and Revenue Gap – APSPDCL							
	FY 2003-04		FY 2004-05			FY 2005-06		
	Proposed	Approved	Proposed	Approved	Actual	Proposed	Approved	Actual
Total Net								
ARR	2411.0	2382.5	2345.9	2281.5	2194.5	2593.9	2539.2	2609.1
Net Revenue								
Gap	598.7	496.6	458.5	410.7	328.1	707.1	606.1	641.7

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It can be observed from above that the actual ARR and revenue gap for APSPDCL are below the approved amount by 3.8% and 20.1% respectively in FY 2004-05. On the other hand, in FY 2005-06, the actual ARR was 2.8% and revenue gap was 5.9% greater than the gap approved by APERC.

Tariff Rate Balancing

Approach to Tariff Determination

Since its first Tariff Order in FY 2000-01, APERC has used the Cost-of-Service (CoS) model as the basis for structure and design of retail tariffs. This model is primarily based on the principle of recovering the Commission approved embedded costs by way of tariff adjustments. Other objectives of this tariff model are to identify the extent of cross subsidy and to provide a measure of value for energy saving.

Under this model, the Commission initially allocates each cost item (approved) into three headings i.e. energy component, demand component and customer service component. While the energy component comprises of the variable portion of total power purchase costs, the demand component comprises of the fixed portion along with a part of the network costs. The customer service component (i.e. metering, billing and consumer servicing) forms the remaining portion of the network costs. Such classified cost components are apportioned among consumer categories so as to determine the Fully Allocated Costs (FAC). Subsequently, APERC determines the constraints on increase of tariffs in respect of the subsidizing categories. The tariff increase in these categories upto the constraint level provides the level of cross-subsidy. Thereafter, the Commission communicates to the Government of Andhra Pradesh (GoAP) enquiring whether the later intends to extend cross-subsidy to a customer category. Based on the government's response, the FAC is assigned to each consumer category and the cost to serve per unit of a category is determined. The later is also referred to as the Fully Allocated Cost Tariff (FACT).

In Tariff filings for FY2002-03, FY 2003-04 and FY 2004-05, the licensees had proposed the following changes to the CoS model:

- Shift to the morning peak
- The use of non-coincident peak loads to allocate demand related costs

The Commission, after examining the load curves for individual consumer categories, opined that evening peak should be retained. The Commission justified this on the ground that exclusion of agricultural demand leads to continuation of the evening peak. On the issue of using non-coincident peak loads, APERC stated that all investments in generation and transmission facilities were planned to cater to the system peak and hence the use of coincident peak demand was well reasoned. For the licensees to modify their current CoS, the Commission, in its Tariff Order 2005-06, directed each DISCOM to set-up a Load Research Cell so as to improve the quality of supporting data.

In FY 2006-07, the Commission issued the first Multi-Year Tariff (MYT) Order for the DISCOMs considering a control period from FY 2006-07 to FY 2008-09. The Commission has separately determined the ARR for the retail supply business and the retail tariffs for FY 2006-07. It has nevertheless preferred to maintain a Common Order format for all DISCOMs. In the MYT tariff order, while the Commission has given the distribution loss trajectory for licensees during the control period, it has only stated the broad norms for fixation of targets for other items such as O&M expenditure and Return on Capital Employed (RoCE). In addition to the above, MYT Orders have been issued for Transmission and Wheeling business. The Commission would shortly be issuing the MYT Regulations for terms and conditions for determination of tariffs for sale of electricity by a generating company and purchase by licensees.

New initiatives in tariff design

While designing the tariffs for various categories, the Commission takes the following factors into consideration:

1. **Gradual movement of tariffs to align with the CoS:**
In Tariff Order of FY 2003-04, the Commission attempted to correct the imbalances in rate differentials between the subsidizing and subsidized categories. In this direction, the Commission reduced the tariff for highest slab of the non-domestic/commercial LT-II consumers, a category with the highest tariff rate amongst subsidizing categories. In subsequent orders, due to the subsidy provided by GoAP, the Commission has primarily focussed on aligning tariff rates with CoS for HT category (including Railway

Traction). For subsidizing categories that have witnessed only marginal reduction in tariffs, the Commission has viewed that tariffs have actually reduced in real terms.

2. Design tariffs to incentivize/encourage:

- a. Incentive Scheme for Industrial consumers: APERC introduced an incentive scheme in FY 2001-02 for HT-I consumer category on energy consumed in excess of a base level. The primary intention of this scheme was to encourage return of industrial consumers back from captive consumption to grid supply. In this context, the base was fixed at the consumption equivalent of 30% load factor or monthly average for FY2000-01, whichever ever is higher. This scheme was to end on March 31, 2005. In its Tariff Order for FY 2005-06, the Commission introduced a modified incentive scheme wherein the eligibility for incentive was maintained but the quantum of incentive on energy consumption was reduced by 5%. This scheme has been effective in attracting third party consumers back to the grid and HT Industrial consumption has increased from 3000 MU to about 11000 MU since its initiation. The trend of revenues from HT-I category is highlighted in the Figure 2.9.

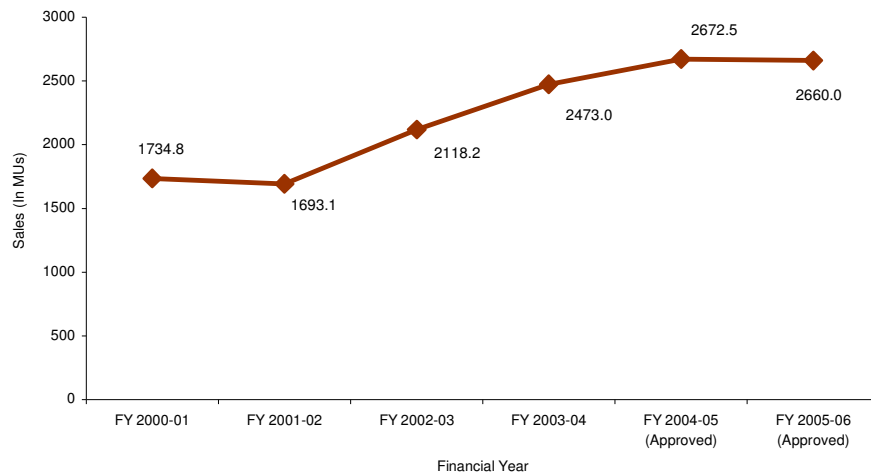


Figure 2.9: Trend of Revenues from sales to HT-I category

SOURCE Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

- b. Metering for Agricultural Category: In Tariff Order 2002-03, APERC directed the licensees to submit a metering plan for agricultural connections. As per the plans furnished by the licensees, all agricultural connections were to be metered by the year 2007. To encourage metering in the agriculture sector, the Commission in its Tariff Order 2003-04 decided that

farmers who decided to get their pumpsets metered till June 30, 2003 would avail of fixed metered tariff (20 paise per unit up to 2500 units and 50 paise per unit thereafter) for the next three years. This freeze was further extended for all farmers who opted for metering till September 2003. In Tariff Order 2004-05, the Commission decided that all new connections for agricultural purposes should be provided with meters. In May 2004, GoAP announced its policy of free power to agriculture that effectively abolished metered tariff for LT-V agricultural category.

- c. **Time of Day (ToD) Tariffs: Availability Based Tariff** was adopted at the DISCOM level from January 1, 2003. Based on ABT implementation and investments by the DISCOMs to install electronic meters, the Commission considered adoption of Time of Day (ToD) tariffs in Tariff Order 2003-04. Towards this end, the Commission directed the DISCOMs to explore and identify consumers who are using high quantum of electricity and cases where ToD tariffs can be implemented effectively. In Tariff Order 2004-05, the Commission directed the DISCOMs to specify the following details for large consumers: a) metering facility; b) consumption patterns and c) proposed incentive. However, as per the Tariff Order 2005-06, the Commission has noted that limited progress has been made in specifying a plan for introducing ToD tariffs in the state. Thereafter, the DISCOMs undertook a study on introducing ToD tariffs in the state. It was observed that the load curve in Andhra Pradesh is flat on account of supply of electricity to agriculture during off-peak period. Moreover, the study revealed that there exist seasonal peaks rather than ToD peaks. Based on this analysis, the Commission has directed the DISCOMs to further investigate into the possibilities of introducing ToD tariffs.

3. **Simplifying the slab structure:**

One of the stated emphases of APERC has been to simplify the slab structure. In Tariff Order of FY 2003-04, the Commission reduced the number of slabs in the Non Domestic/Commercial – LT-II category from three to two. Simultaneously, the Commission has directed the DISCOMs to conduct door-to-door checking for all services and remove multiple connections so as to enable it to progressively rationalize the slab structure. However, Tariff Orders for FY 2004-05 and FY 2005-06 did not introduce any further changes in the slab structure.

Category-wise Average Tariff

Table 2.49 shows the average realization from tariffs for FY 2003-04, FY 2004-05 and FY 2005-06. It indicates the average realization and sales for various consumers at LT and HT level.

Table 2.49: Approved average realization from FY 2003-04 to FY 2005-06 (Rs. Crores)

Category	FY 2003-04			FY 2004-05			FY 2005-06		
	Sales	Revenue	Average Realization	Sales	Revenue	Average Realization	Sales	Revenue	Average Realization
Low Tension									
Domestic	8205.8	1973.7	2.4	7887.0	1901.8	2.4	8597.4	2039.2	2.4
Non-Domestic/Commercial	1813.8	1071.8	5.9	1795.0	1018.9	5.7	1970.4	1128.3	5.7
Industrial	2240.6	930.9	4.2	1950.0	801.6	4.1	2290.4	923.2	4.0
Cottage Industries & Dhobighats	32.8	7.0	2.1	35.0	7.4	2.1	46.0	9.1	2.0
Agriculture	11350.0	363.0	0.3	11450.0	409.2	0.4	12646.8	67.1	0.1
Local Bodies, Street Lighting and PWS schemes	696.8	146.3	2.1	1054.0	205.3	1.9	1304.7	221.0	1.7
General Purpose	101.3	41.0	4.0	98.0	39.6	4.0	112.6	45.7	4.1
Temporary Supply	20.3	12.6	6.2	9.0	5.6	6.2	8.5	5.3	6.2
Sub-Total- LT Category	24461.3	4546.1	1.9	24278.0	4389.4	1.8	26976.8	4438.8	1.6
High Tension									
Industry - General	5531.4	2376.3	4.3	6567.0	2607.4	4.0	7119.0	3139.9	4.4
Industry - Other	818.1	435.1	5.3	730.0	391.2	5.4	936.0	499.0	5.3
Irrigation and Agriculture	175.7	29.4	1.7	188.0	33.9	1.8	229.7	38.9	1.7
Railway Traction	1155.4	531.5	4.6	1152.0	507.0	4.4	1205.3	530.4	4.4
Townships and Residential Colonies	182.4	58.4	3.2	197.0	69.0	3.5	244.3	85.5	3.5
RESCOs	1121.0	48.8	0.4	1121.0	52.7	0.5	666.1	26.7	0.4
Temporary	12.0	6.3	5.3	1.0	0.5	5.1	1.8	0.9	5.2
Sub-Total - HT Category	8996.0	3485.8	3.9	9956.0	3661.8	3.7	11465.2	4321.4	3.8
Total - HT & LT Category	33457.3	8032.0	2.4	34234.0	8051.2	2.4	38442.0	8882.4	2.3

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It can be observed from the above table that average realization from domestic and commercial/non-domestic consumers under LT category and Industry, Railway Traction and Townships & Residential Colonies under HT category currently have a much higher average realization vis-à-vis that for HT & LT categories combined. A comparison of the average realization and average cost provides a measure of the extent to which the tariff covers the cost for a particular consumer category viz. cost recovery. The Figure 2.10 and 2.11 highlight the trend of average realization-to-average cost ratio for selected the consumer categories at the LT and HT level.

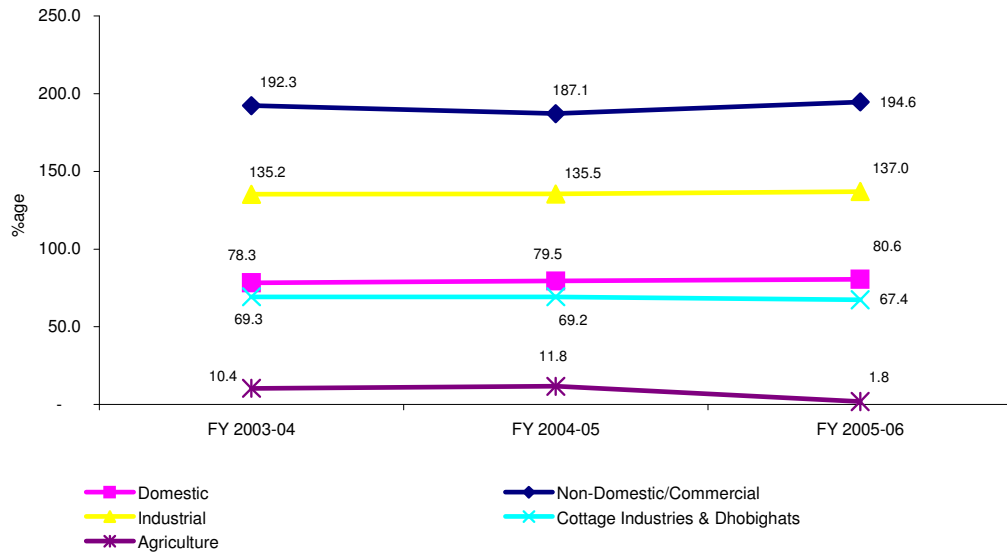


Figure 2.10: Average Realization/Average Cost – LT Category

SOURCE Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

06)

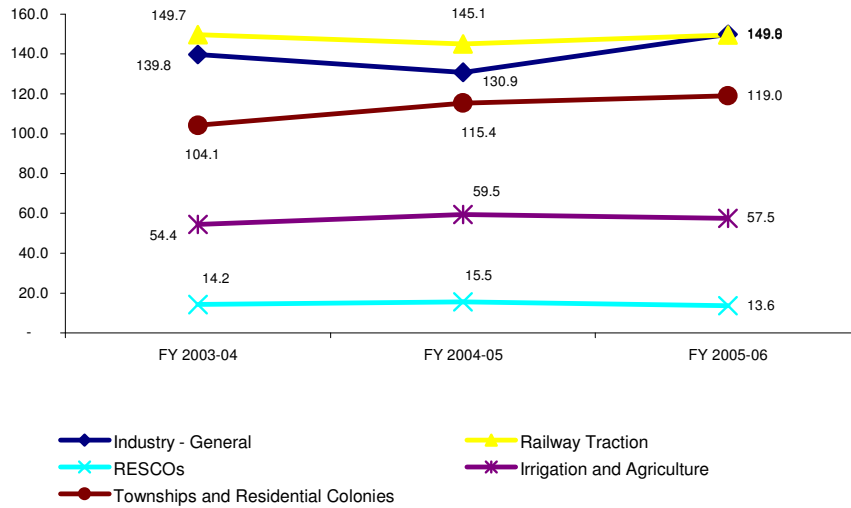


Figure 2.11: Average Realization/Average Cost – HT Category

SOURCE Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It can be observed from Table 2.49 that within the LT category, both industrial and non-domestic/commercial consumers are contributing more revenue for the DISCOMs than the average cost. It is worth observing that the revenue contribution of agriculture consumers has shown a decline in FY 2005-06, possibly due to the GoAP decision to allow free power to the TERI Report No. RP23

agriculture sector in FY 2004-05. On the other hand, within the HT category, the proportion of average tariff to cost has shown an increase for industry (general) consumers in FY 2005-06. The LT-Agriculture and HT-RESCOs consumers are a highly subsidized category. On the overall, cost recovery for the DISCOMs has improved marginally from 82.1% in FY 2003-04 to 83.7% in FY 2005-06.

Cross Subsidy

In its First Tariff Order, APERC had set a cap of 5-6% on increase of tariff in respect of the subsidizing categories. In subsequent Orders, the cap has been reduced to zero for some categories and negative for some other categories (HT-Industry and Railway Traction). As highlighted earlier, even though the tariffs for subsidized categories have remained almost constant due to GoAP subsidy, the same have reduced slightly for some subsidizing categories. In this scenario, the Commission has maintained the level of cross-subsidy by mandating efficiency targets, regulating captive generation and third-party sales and providing incentives for a higher load factor. The amount of cross-subsidy for various consumer categories for FY 2004-05 and FY 2005-06 is presented in Table 2.50.

Table 2.50: Amount of Cross Subsidy over the years (Rs. Crores)

Category	FY 2004-05	FY 2005-06
Domestic	655.1	779.8
Cottage Industries	2.4	3.0
LT-Agriculture	821.2	1176.2
Local Bodies	147.9	166.2
HT-Agriculture	6.5	8.9
RESCOs	121.5	80.5
Total	1754.6	2214.5

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Convergence Index (CI)²⁴

²⁴ The Convergence Index measures the extent to which the average realization from each category converges towards the overall average realization.

$$C.I = \sqrt{\frac{\sum [(ARc/OAr) - 1]^2 Fc}{\sum Fc}}$$

Where

C.I = Convergence Index

ARc = Average realization of each consumer category (Rs/kWh)

OAr = Overall average realization (Rs/kWh)

Fc = Revenue from each consumer category (Rs. Crores)

Any improvement in terms of tariff rationalisation gets reflected in a reduction in this index after a change in tariffs by the regulator. Hence the index captures the movement of the realisation from each category to the overall average realisation, i.e., to what extent each category pays the same tariff. If for all consumer categories, the average tariffs are equal, then the ratio of these two (ARc/OAr) will be 1 and hence the Convergence Index will become Zero. Such an index can give perverse findings if the HT tariffs are below the average cost and LT are above the average cost. Since this is not the case at present it can be expected that there will be no perverse findings reported.

The trend in movement of CI from FY 2003-04 to FY 2005-06 is presented in Figure 2.12.

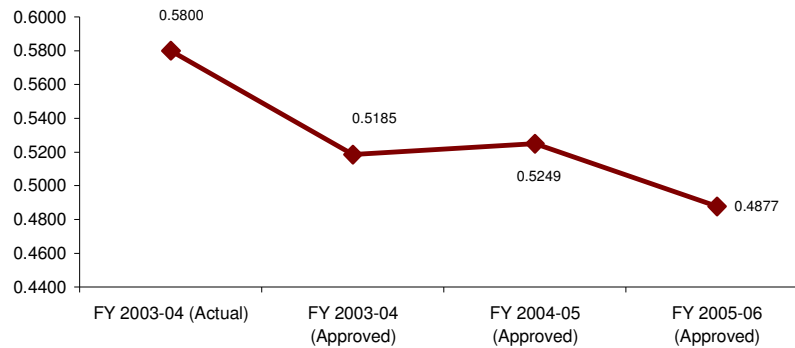


Figure 2.12: Convergence Index for Andhra Pradesh

SOURCE TERI estimates

It can be observed from the above figure that level of cross subsidization showed an increase from FY 2003-04 to FY 2004-05, before decreasing in FY 2005-06.

Subsidy Support from Government

As highlighted earlier, the GoAP determines the subsidy amount for each customer category based on the fully allocated costs (FAC) communicated to it by the Commission. Subsequently, the government takes a decision on the extent it will cover the FAC for the subsidized categories. The Commission has specified that GoAP shall administer subsidy to the DISCOMs on a monthly basis, failing which the licensees would have to revert to charging the FACT. Further, it has directed the utilities that any surplus allocation of subsidy needs to be refunded to the GoAP and that BST rate will be applicable in case the actual drawl of electricity is in excess of that allotted for RESCOs. According to the Commission, the subsidy is given to the DISCOMs on schedule.

In FY 2003-04, the total ARR approved by the Commission was Rs. 9780.8 crore as against Rs. 9773.5 crore proposed by the DISCOMs. On the other hand, the expected revenue from tariffs was Rs. 7972.3 crores, thereby leaving a gap of Rs. 1748.9 crores, which the Commission proposed to cover either through tariff changes, efficiency gains or GoAP subsidy. Of the total approved ARR, the Commission allotted Rs. 395 crore to efficiency gains and the remaining Rs. 9485.8 crore as FACT

Ideally, the average realisation from each consumer category should be equal to the cost incurred in serving that category. Thus, if a voltage wise classification is used average tariff from each category should equal the cost at the respective voltage level. However, it has not been used for all the states in this study due to non availability of as data.

that was communicated to the GoAP for fixation of the subsidy amount. As the GoAP decided on retaining the existing tariffs for subsidized categories, a subsidy of Rs. 1513.5 crore was granted to the DISCOMs for FY 2003-04.

In FY 2004-05, the total ARR approved by the Commission was Rs. 9654.4 crore as against Rs. 10289.1 crore proposed by the DISCOMs. The Commission mandated efficiency gains of Rs. 300 crores for the year and communicated Rs. 9354.5 crore as FACT to the GoAP. With expected revenue from tariffs of Rs. 8051.2 crore, the gap at approved tariffs for FY 2004-05 was Rs. 1303.0 crore. The GoAP accorded this amount as subsidy to the DISCOMs.

In FY 2005-06, the total approved ARR was Rs. 10606.9 crore as against Rs. 11467.3 crore proposed by the DISCOMs. For this year, the Commission directed the licensees to achieve efficiency gains of Rs. 125.0 crore and accordingly the FACT was Rs. 10481.9. The gap for FY 2005-06 was estimated as Rs. 1599.5 crore, which was allotted by GoAP as subsidy. The trend of subsidy allocation for various customer categories from FY 2003-04 to FY 2005-06 is highlighted in the Table 2.51.

Table 2.51: Subsidy amount

(Rs. Crores)

<i>Customer Category</i>	<i>FY 2003-04</i>	<i>FY 2004-05</i>	<i>FY 2005-06</i>	<i>CAGR</i>
Domestic	730.0	486.3	544.4	-13.7%
Cottage Industries	1.7	1.8	2.1	12.1%
LT Agriculture	664.7	610.0	871.2	14.5%
Local Bodies	45.3	109.8	117.5	61.1%
HT Agriculture	1.0	4.4	6.4	150.7%
RESCOs	70.9	91.0	57.9	-9.6%
Total	1513.5	1303.3	1599.5	2.8%

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

The above table shows that the maximum increase in subsidy allocation from GoAP has been for the HT Agriculture and Local bodies. On the other hand, the subsidy allotted to domestic and RESCOs categories has shown a declining trend. In all three years under study, the LT agriculture category received the highest support from GoAP.

The actual and approved revenue gap from FY 2003-04 to FY 2005-06 is highlighted in Table 2.52.

Table 2.52: Revenue Gap (FY 2003-04 to FY 2005-06) – In Rs. Crores

	FY 2003-04		FY 2004-05	FY 2005-06
	Approved	Actual	Approved	Approved
APEPDCL	-4.10	49.9	31.5	32.2
APCPDCL	332.22	231.2	281.1	-304.6
APNPDCL	680.59	23.3	580.2	-720.9
APSPDCL	496.58	34.6	410.4	-602.1
Total	1505.29	339.0	1303.2	-1595.4

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

To apportion some part of the financial losses in the subsequent ARR, the Commission has formalized a pass through mechanism that is discussed below.

Treatment of financial loss - Pass-through mechanism

In the Tariff Order 2003-04, APERC suggested preliminary principles of a pass-through mechanism to account for uncontrollable cost variations not envisaged by the ARR and GoAP subsidy of previous year. APERC suggested this mechanism in wake of demands from the licensees to treat their losses for FY 2001-02 and FY 2002-03 as a regulatory asset. Accordingly, the Commission broadly defined the uncontrollable factors as vagaries of nature, changes of laws of the land and judicial pronouncements, government policies and economic conditions beyond the influence of the licensees. The Commission also laid down the following two-step correction methodology for correcting the financial losses or gains arising from uncontrollable factors:

- The first correction would be based on the best information made available to the Commission for operations of the current year. This information would be based on actuals of the first half and estimates of the second half of the particular financial year.
- The second correction would be based on audited accounts for the year.

The pass-through so determined by the above two-step methodology was proposed to be considered in the revenue requirement of ensuing year as a special appropriation.

In the Tariff Order 2004-05, the Commission dealt in detail with the principles of 'True-up' and related regulatory treatment for each expenditure item of the DISCOMs. The Commission also clarified that pass-through principles were applicable to the regulatory accounts and not to the P&L Account and Balance Sheet of the DISCOMs. The logic behind this pronouncement was that the P&L Account covers the total business of the licensee whereas the regulatory accounts only related to the regulated business. The Commission also stated that variations in HT sales cannot be considered for true-up or be classified as uncontrollable factor.

Table 2.53 summarizes the Commission's assessment for true-up on various expenditure items:

Table 2.53: True-up on various expenditure items

Items	Controllable/Non-controllable	Need for true-up
Power purchase cost	Non-controllable	Generally through Fuel Surcharge Adjustment (FSA) True-up not required
Wages, Salaries and PF	Controllable	
Administration and General Expenses	Controllable	
Rent, Rates and Taxes	Controllable	True-up on filing of tax returns
Repairs	Controllable	No true-up required
Interest	Controllable	True-up linked to capitalization of capital works
Depreciation	Controllable	
Special Appropriations: Debt Redemption Obligation	Controllable	No true-up
Income Tax	Non-controllable	True-up on filing of returns
Working Capital	Controllable	No True-up
Reasonable Return	Non-Controllable	Variations on account of net capital base and loans

Source: Tariff Orders issued by APERC (FY 2005-06)

The special appropriation allowed in the ARR calculations of the DISCOMs as true-up for uncontrollable cost items from FY 2003-04 to FY 2004-05 is highlighted in Table 2.54:

Table 2.54: Special Appropriations for DISCOMs under Pass through mechanism

Financial Year(s)	Amount (In Rs. Crore)
2003-04	(8.3)
2004-05	86.1
2005-06	16.6

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Apart from allowing for special appropriation under the pass-through mechanism, APERC has also fixed a contribution for all DISCOM towards a contingencies reserve. In this context, the licensees have to necessarily make a provision of 0.25% of the Original Cost of Fixed Assets (OCFA) projected in the filing. The contribution towards this reserve is to be invested within six months in securities authorized under the Indian Trusts Act 1882.

Governance

Public participation

To invite participation of various stakeholders in the rate making process, the Commission, subsequent to the receipt of petitions, directs the licensees to serve public notices in two English and Telegu dailies. Following such notice, APERC collates the suggestions of various stakeholders and notifies the objectors, licensees, media and GoAP on the date and venue of public hearings. The level of public participation in these hearings is summarized in Table 2.55:

Table 2.55: Level of public participation in public hearings

Year	Time given for filing comments/objections (days)	No. of written objections	Total no. of participants
FY 2003-04	33	10	74
FY 2004-05	35	11	95
FY 2005-06	40	19	185

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It can be observed from above that the number of written objections is low in comparison to the total number of participants. Till FY 2004-05, the Commission used to hold public hearings in Hyderabad (for APCPDCL, APNPDCL and APEPDCL) and Tirupathi (APSPDCL). To improve participation across the DISCOMs, in FY 2005-06, APERC scheduled hearings in Hyderabad (APCPDCL), Warangal (APNPDCL), Vishakapatnam (APEPDCL) and Tirupathi (APSPDCL). Correspondingly, the participation at the hearings increased from 95 in FY 2004-05 to 185 in FY 2005-06. The DISCOM-wise break-up of objections received is given in Table 2.56:

Table 2.56: DISCOM-wise break-up of objections received

Year	APEPDCL	APCPDCL	APNPDCL	APSPDCL	Common to DISCOMs
FY 2003-04	02	12	05	55	-
FY 2004-05	01	13	03	62	16
FY 2005-06	15	23	36	96	15

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Apart from decentralizing the public hearing process, the Commission initiated the following measures to improve public participation:

- Instead of filing six copies as was the norm earlier, the Commission in Tariff Order for FY 2003-04 permitted submission of objections to ARR filings in duplicate.
- All the objections and representations received are uploaded on the website of the Commission.
- To facilitate better understanding amongst the public on principles of tariff setting, the Commission directed the DISCOMs to file a summary of ARR in Telugu and make it available to the public on payment of Rs. 10/-. Further, from FY 2004-05, the Commission has been publishing the Tariff Order in Telugu.
- To improve farmers' participation, the Commission intends to initiate an awareness campaign and study the procedure adopted in Karnataka.

However, the Commission has found limited merit to allow on-the-spot registrations for the hearing process.

In addition to the above, so as to promote transparency in the licensee operations, in Tariff Order of FY 2004-05, the Commission issued directions to the DISCOMs to host details on merit order dispatch, transmission losses, DTR failures (circle-wise) and power supply failure on daily basis.

Timeliness of Tariff Orders

In finalizing the tariff order for transmission and bulk supply and for distribution and retail supply operations, the Commission considers the objections and issues raised by the public, the views of Commission staff and licensees and the discussions held during the State Advisory Committee (SAC). In addition, the Commission in finalizing the Tariff Order for FY 2005-06 also invited representation from GoAP for all public hearings.

The EA 03 mandates that the Commission must issue the tariff order within 120 days of the acceptance of the petition. Table 2.57 indicates the timeliness of various tariff orders issued by APERC.

Table 2.57: Timeliness of Tariff Orders issued by APERC

<i>Year</i>	<i>Date of filing of petition</i>	<i>Date of Issuance of Order</i>	<i>Days from acceptance to issuance</i>
FY 2003-04	31-12-2002	24-03-2003	114
FY 2004-05	24-12-2003 and corrigendum to ERC filing on 26-12-2003	23-03-2004	119
FY 2005-06	30-11-2004 and addendum filings (after introduction of new agriculture policy) on 07-02-2005	22-03-2005	112

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

It is evident from above that APERC has adhered to the stipulated timeline of issuing the Tariff Orders.

Consumer Advocacy and Redressal Mechanism

In FY 2002-03, APERC issued a 'Consumer Rights Statement' that outlined the services a consumer can expect from a licensee and the steps that a consumer needs to take so as to enable the service provider improve quality of supply. The Commission also notified a code of practice aimed to establishing a standard procedure for issue and payment of electricity bills. A related measure was to lay down the complaint handling procedure that stipulates the nature of complaints, procedure and time limit for their rectification. Subsequent to the enactment of the Electricity Act 2003, in February 2004, the Commission laid down the regulation for 'Establishment of Forum and Vidyut Ombudsman' for redressal of consumer grievances. This regulation required all licensees to establish a grievance redressal forum comprising of three members and one co-opted representative of a registered consumer organization. The Vidyut Ombudsman was proposed to comprise of an independent person responsible for

receiving representation against the orders of the forum. In consonance with the regulation, all the four DISCOMs have established a Consumer Grievance Forum and these have started functioning with effect from the following dates:

Table 2.58: Status on Consumer Grievance Forum

<i>Forum of DISCOM</i>	<i>Date of operationalisation of the Consumer Grievance Forum</i>
APEPDCL	26-02-2005
APCPDCL	08-01-2005
APNPDCL	06-01-2005
APSPDCL	06-01-2005

Source: Information provided by APERC

Each of the Forums comprise of a Chairperson and two members responsible for the revenue and legal functions. In September 2005, the Commission established a Vidyut Ombudsman. Presently, the Secretary of the Commission is functioning as ex-officio Electricity Ombudsman.

The Commission has also directed the DISCOMs to improve customer interface and redressal mechanism especially in rural areas. For this, APERC proposed increasing the frequency of sub-station wise meetings. In the Tariff Order for FY 2005-06, APERC noted that the DISCOMs (except APNPDCL) had not included in their filings an account of the adherence to standards of performance and functioning of the redressal mechanism. The Commission directed the DISCOMs to report relevant data in the ARR filings for FY 2006-07. Simultaneously, the Commission required the DISCOMs to issue consumer passbooks at customer service centers established at the sub-division level. Such passbooks were intended to record meter readings and other billing particulars so as to reduce the incidence of billing-related complaints. However, according to the Tariff Order for FY 2006-07, this directive has not been complied in its entirety by the DISCOMs. This Tariff Order also highlighted the absence of co-opted members (i.e. representatives of consumer organizations) on grievance redressal forum of the DISCOMs.

Anti-theft measures

The DISCOMs are currently using a software known as 'Consumer Analysis Tool (CAT)' that helps analyze the consumption pattern of different categories. In case any abnormality is observed, the officials of the DISCOM would inspect the premises to ensure that there is no power theft. Further, there are 'Anti Power Theft Squads (APTS)' from the Andhra Pradesh Police. This squad is divided into 'Detection and Pilferage of Energy (DPE)' teams that are entrusted with the responsibility to conduct raids and surprise checks. If any

theft is found, these teams register cases and initiate action to prosecute the offenders.

Key Regulatory Initiatives

The Commission has been particularly active in developing various rules and regulations towards introducing measures such as Demand Side Management, Open Access, Multi-Buyer Model (MBM) and Multi-Year Tariffs (MYT) etc. While MBM and MYT initiatives are discussed in subsequent sections, the measures initiated by APERC to introduce DSM and Open Access are discussed as under.

Demand Side Management (DSM) measures

In its order of FY 2001-02, APERC identified the need to incentivize DSM in agricultural category and accordingly allowed a 50% discount on monthly energy charges in slab system or metered system. The conditions for availing this rebate include:

- Friction-less foot valve
- HDPE piping for suction and delivery
- ISI marked pumpset
- Capacitor of adequate rating for the pumpset

Since then, the Commission has continued with this incentive scheme for agricultural category along with the 'Out-of-Turn' allotment scheme (introduced in Tariff Order for FY 2002-03). In Tariff Order for FY 2004-05, the Commission decided that all new connections for agricultural purposes should be provided with meters and DSM measures implemented. Further, the Commission directed the DISCOMs to give wide publicity on DSM measures and its advantages such as energy savings and voltage improvements.

During the public hearing for ARR petitions of the DISCOMs for FY 2005-06, the Commission received a large number of objections on DSM measures, especially for capacitor compensation for the inductive load of agricultural sector. These objections largely pertained to the inadequate involvement of consumers in DSM measures and consequent lack of upkeep of the equipment. Concerns were also raised on the likelihood of success of such measures in the presence of free power or flat-rate supply scenario.

For non-agricultural consumers the Commission has not specified any exclusive DSM measures. However, tariff conditions like low power factor surcharge and load factor incentive etc. are aimed at efficient load management.

Introduction of Open Access

In accordance to section 42(3) of the EA 2003, APERC issued the regulation on ‘Open Access (OA) to Intra-state transmission and distribution networks’ in July 2005. The Regulation specified the following phasing of Open Access (Table 2.59) in Andhra Pradesh.

Table 2.59: Phasing of Open Access in Andhra Pradesh

<i>Phase</i>	<i>Eligibility Criteria</i>	<i>Commencement Date</i>
1	Consumers availing of power from NCE developers irrespective of the quantum of contracted capacity	September 2005
2.	Contracted capacity being greater than 5 MW	September 2005
3.	Contracted capacity being greater than 2 MW	September 2006
4.	Contracted capacity being greater than 1 MW	April 2008

Source: Information provided by APERC

The Commission also finalized methods to be adopted for computation of OA Surcharge as well as framed associated regulations on ‘Transmission and Wheeling charges’ and ‘Balancing and Settlement Code for Open Access Transactions’. The Code provides for a day-ahead wheeling schedule of energy on the basis of 15-minute time blocks and monthly settlement of deviations. In addition to the above, the Commission approved the Formats for long-term and short-term Open Access Agreements as required under Section 12 of the OA Regulation. These formats are hosted on the Commission’s website. However, due to the existing structural limitations (transmission and distribution network congestion), Open Access activity from the private sector has remained absent. Apart from this structural constraint, there are several charges that an OA consumer typically pays i.e. i) Cross Subsidy surcharge; ii) Transmission and wheeling charges; iii) Captive charges and iv) Parallel grid operations charges etc. These charges make OA activity commercially unviable. Therefore, despite the regulation in place, there is limited interest in OA at the state level.

Appeals against Orders

Since its inception, many orders of the Commission have been appealed against in the Appellate Tribunal for Electricity, through writ petitions before the High Court of Andhra Pradesh and the Supreme Court of India. A summary of these appeals and their legal status is given in Table 2.60.

Table 2.60: Summary of appeals against APERC

Total number of appellant	Subject	Legal Status				
		Pending	Dismissed	Appeal partly allowed	Verdict in favour of appellant	Withdrawn
Appeals/Writ Petition before the Supreme Court of India						
16	Appeals before the Supreme Court: Tariff Order for FY 2000-01; Supply of energy by APGPCL requires license; Power of the Commission to direct the Malavalli Power Plant (MPP) to supply energy produced to APTRANSCO; Payment of cost of fuel to APTRANSCO; Levy of wheeling charges by the Commission; Levy of Grid Support Charges by the Commission	10	2	4	-	-
Appeals/Writ Petition before the High Court of Andhra Pradesh						
262	Supply of energy by Non-conventional Energy Development Corporation of Andhra Pradesh (NEDCAP) units to third parties; Directive to MPP to supply power only to APTRANSCO; Rate fixing for developers of non-conventional energy to supply energy to APTRANSCO; Powers of the Commission to review policies issued by GoAP; Prohibition of third-party sales by mini-power projects; Tariff Order for FY 2000-01, FY 2001-02, FY 2002-03, FY 2003-04; Appeals against order of APERC on Wheeling Charges and Grid Support Charges; Issues relating to Captive Power Producers; Petitions with regard to license or exemption; Cases under Section 44 of the Electricity Supply Act	178	63	7	2	13
Appeals with Lok Ayukta		52				

Source: Website of APERC Website: www.ercap.org

The above table shows that most of the appeals against APERC are either pending in the Supreme Court or the High Court. Of the cases that have been resolved, most stand dismissed in favour of the Commission. The number of complaints received by the Forums and Ombudsman during FY 2005-06 is indicated in Table 2.61.

Table 2.61: Number of cases received and resolved by DISCOMs

<i>Forum of DISCOMs</i>	<i>No. of Cases Received</i>	<i>No. of cases resolved</i>
APEPDCL	158	149
APCPDCL	24	20
APNPDCL	73	64
APSPDCL	87	86
Total	342	319

Source: Information provided by APERC

Table 2.62: Nature of complaints received by the Forums

Nature of Complaints	APEPDCL	APCPDCL	APNPDCL	APSPDCL	Total
Billing related	14	75	27	23	139
O&M related	4	30	17	-	51
Release of new services	-	27	6	-	33
Category change	-	5	5	14	24
Title transfer	-	5	1	4	10
Theft and malpractice	-	16	7	-	23
Complaints against staff	-	-	7	-	7
Meter Shifting	-	-	-	1	1
Disconnection of Supply	-	-	-	2	2
General	6	-	3	43	52
Total	24	158	73	87	342

Source: Information provided by APERC

The number and nature of appeals received by the Vidyut Ombudsman since its establishment is listed in Table 2.63.

Table 2.63: Cases handled by the Vidyut Ombudsman

<i>Forum of DISCOMs</i>	<i>FY 2005-06</i>	<i>FY 2006-07 (Till September 2006)</i>
Number of appeals received	11	21
Number of appeals disposed	7	12

<i>S.No.</i>	<i>Nature of Grievance</i>	<i>Number of appeals</i>
1.	Excess/Back billing due to meter defect/alleged suppressed consumption/wrong reading	9
2.	Regarding development charges	3
3.	Procedure for replacement of burnt meters	2
4.	Back billing at HT Tariff	1
5.	Defect in DTR Structure and LT line for new connections	1
6.	Categorization	3
7.	Capacitor Surcharge	3
8.	Fixing of meters outside the shops	1
9.	Refusal of shifting of service to new premises	1
10.	Delay in change of name of consumer	1
11.	Allowing supply to tenant	1
12.	Related to agricultural services	4
13.	Miscellaneous	2

Source: Information provided by APERC

It is clear from above tables that billing related cases are the most contested in both the Redressal Forum and the Ombudsman.

Staffing

The Commission is headed by the Chairperson and two members. In discharge of its mandated functions, the Commission is assisted by 56 employees comprising of 19 officials and 35 supporting staff. The officers, amongst others,

comprise of the Commission Secretary and four directors, responsible for functions such as Administration, Engineering, Law and Tariffs. Further, there are a few Joint Directors and Deputy Directors to assist the Commission in its functioning. Support staff provides help to the officers for conducting their routine work.

On major issues pertaining to policy, quality of service, protection of consumer interests and standards of performance, a State Advisory Committee (SAC) guides the Commission. This committee currently comprises of 17 members, including the Chairperson and members of APERC. The SAC represents the interests of commerce, industry, transport, agriculture, labour, consumers, NGOs and academic and research bodies in the electricity sector and meets on a quarterly basis.

Directives Issued by APERC and their Compliance

In all the Tariff Orders under study viz. FY 2003-04, FY 2004-05 and FY 2005-06, the Commission has pointed to the partial compliance to directives by the DISCOMs. On the other hand, the compliance to directives by APTRANSCO has been more impressive. While the status of compliance on directives issued in Tariff Order for FY 2003-04 and FY 2004-05 is summarized in Table 2.65, the DISCOM-wise compliance status is presented below.

Table 2.64: Appeals received by Vidyut Ombudsman

Financial Year	No. of Directives	Status of Compliance		
		Complied	Partially	Not Complied
FY 2003-04	17	10	5	2
FY 2004-05	15	7	6	2

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Table 2.65: Status of Compliance to APERC Directives by the Distribution Licensees

Directive	APEPDCL	APCPDCL	APNPDCL	APSPDCL
Defaulters' List: DISCOMs to post on their website, the list of all defaulters whose dues exceed Rs. 50,000, along with the reasons for non-collection and details of litigation. Updation to be carried out every six months.	Complied. Data on dues as on September 30, 2006 on the licensee's website	Complied	Compliance ongoing	Complied. Updated list as on September 2005 placed on APSPDCL website
Consumer Passbooks: DISCOMs to issue consumer passbooks to all consumers	Not complied.	Limited response of consumers to utilize the passbook facility	Passbooks being maintained and updated for agricultural services. Requested APERC to re-examine the directive in light of spot billing being implemented by the DISCOM	Compliance ongoing
24-hour supply to Rural Areas: DISCOMs to estimate the additional power requirement to provide 24-hour supply to rural areas and identify the generation sources to procure additional energy	APEPDCL has estimated that there would be 33% increase in consumption on account of extending 24-hours supply to rural areas. This would be an increase of 266 MU for FY 2005-06	Complied: Additional power requirement specified in the ARR filing	Estimates provided in the ARR filing for FY 2006-07	Submitted as part of the ARR Filing for FY 2006-07

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Directive	APEPDCL	APCPDCL	APNPDCL	APSPDCL
Display of LV Side Meter Data: DISCOMs to display a permanent display board at every circle/district headquarters and post details such as number of services, metered DTRs and DTRs providing valid readings. Compliance by 15th of every month	Compliance ongoing	Monthly information on estimated agricultural consumption being displayed mandal-wise at circle HQ and at the corporate office	Compliance ongoing	Even though APSPDCL is maintaining the information on LV side Meter Data, the same is not available in public domain as directed by the Commission
ToD Metering: Licensees to propose specific proposals for introducing ToD metering for large consumers with details on metering facility, consumption pattern and proposed incentive. To be submitted by June 31, 2005	APEPDCL has estimated that there exist 61 HT consumers having ToD facility. The circle-wise status is: Srikakulam-13, Vizianagaram - 5, Visakhapatnam - 13, Rajahmundry - 15, Eluru - 15. The licensee has carried our mock billing in Rajahmundry circle for the month of September 2005	Complied	Study on ToD conducted by KPMG for January 2004 to March 2004. The study shows that system curves were reasonably flat during this period.	Study on ToD metering conducted by KPMG. The study shows that it is feasible to introduce ToD metering. Load Research Center has not been established.
Payment of HT Incentive: There should be no lag in passing on the load factor incentive amount to the HT Category -I (A) consumers from the billing month of October 2005	Complied.	Directive complied from month of October 2005	Directive complied from month of October 2005	Directive complied from month of October 2005
Payment of Testing Fees: DISCOMs to make requisite arrangements to receive payments for meter testing fees at the bill collection centers	Complied.	Complied	Compliance ongoing	Compliance ongoing

Directive	APEPDCL	APCPDCL	APNPDCL	APSPDCL
Reconnection Charges: The licensee cannot collect any recollection charges unless the connection has actually been disconnected	Complied.	Compliance ongoing	Compliance ongoing	Compliance ongoing
Consumer Agreements in Telugu: DISCOMs to initiate action for execution of agreements in Telugu	Complied.	The same is in the process of being complied	The same is in the process of being complied	Not complied.
Review of HT-Incentive Scheme: DISCOMs to make a detailed review of the working of incentive scheme during the first half of FY 2005-06	The details of HT Incentive Scheme submitted to APERC on December 21, 2005	The functioning of Incentive scheme for the period FY 2005-06 reviewed and analysis submitted with the filings	Compliance ongoing	Complied.
Capital Investments: For inclusion of capitalized work in the OCFA, the DISCOMs have to submit to APERC a PCC and FCC within 60 days of completion of work	PCC and FCC are being collected from all operational circles	Steps initiated to furnish FCC and PCC for capitalized works	Compliance ongoing.	Not complied.
Sales Database: Sales forecast for FY 2006-07 should be circle-wise/district wise. Further, the licensees need to separate the sales at each operation circle/district category-wise w.e.f April 2005	Complied.	Information from Sales Database for September 2005 was submitted to APERC	Compliance Ongoing.	Complied.
Consumer Load Profile and Load Research Cell: DISCOMs to conduct a survey of load profiling methods and adopt suitable method for profiling. APERC directed the licensee to comply with this directive by August 2005	APEPDCL collecting feeder-wise hourly load profile of different consumer categories. However, Load Research Cell not established.	Load Research Cell has been established. Being headed by a Superintendent Engineer.	Consumer load profiling being carried out by the Energy Audit wing. Yet to establish a separate Load Research Cell	Complied.
Railway Tariff: DISCOMs to propose two-part tariff for Railway Traction category in tariff proposal for FY 2006-07	Complied. Two-part tariff proposed in the filing for FY 2006-07	Complied. Two-part tariff proposed in the filing for FY 2006-07	Complied. Two-part tariff proposed in the filing for FY 2006-07	Complied.

Source: Tariff Orders issued by APERC (FY 2003-04, FY 2004-05 & FY 2005-06)

Measures to improve Quality of Service (QoS)

The Commission, since its inception, has also focussed on technical quality parameters such as reduction of DTR failure rate and improvement in average frequency and voltage profile. As in the case of T&D loss, the Commission has been fixing targets for gradual reduction in the DTR failures. In Tariff Order for FY 2003-04, the Commission directed the DISCOMs to prepare databases of DTR failures for rural and urban areas separately so as to enable proper benchmarking of licensee performance. The DISCOMs complied with the Commission's directive to maintain such databases. However, while the DTR failure rate has declined from 28.1% in FY 1999-00 to 10.61% in FY 2003-04, it continues to be high and indicates excessive load on existing infrastructure. Another weakness is the low level of distribution transformer metering (less than 9%) resulting doubts on the efficacy of the energy audit system.

In terms of average frequency, there has been an improvement subsequent to the introduction of the ABT. The frequency improved from 48.7 Hz in FY 1999-00 to 49.8 Hz in FY 2003-04. The number of interruptions has also reduced both at 33 kV and 11kV. To improve the voltage profile, the licensees have in recent years invested in the HVDS scheme with a planned investment of Rs. Rs.5500 crores till 2007. In Tariff Order for FY 2005-06, the Commission directed the DISCOMs and APTRANSCO to submit monthly log sheets on supply conditions and summary statement on licensee's performance to rectify interruptions to industrial feeders.

Power sector rating

As per the performance rating of the state power sector carried out at the instance of the Ministry of Power (GoI), Andhra Pradesh has been given the following ratings during FY 2003-04, FY 2004-05 and FY 2005-06 (table 2.66)

Table 2.66: Rating of Andhra Pradesh

	<i>FY 2003-04</i>	<i>FY 2004-05</i>	<i>FY 2005-06</i>
Rank	2	1	1
Score	56.8	57.0	55.8

Source: Power Sector Rating, Ministry of Power, Government of India

Andhra Pradesh has been consistently ranked as the highest amongst Indian states based on its strength in areas such as regulatory processes, operational performance of thermal plants, manpower planning and government support. Despite this, according to the report, there exist certain shortcomings that are listed below:

- High cross-subsidy surcharge hindering the implementation of 'Open Access' policy in the state

- Metered sales remain at a low level, estimated at about 52% of the total units input in the system.
- Even though there has been improvement, the level of receivables at over 96 days of sales in FY 2004-05 is considered high.
- Household electrification is estimated to be 78%
- Low level of distribution transformer metering resulting in energy audit system not being fully effective
- High distribution transformer failure rates in excess of 11%.

Regulations issued

The various regulations notified by APERC are listed in Table 2.67

Table 2.67: Regulations Issued by APERC

<i>Final/Draft Regulations</i>	<i>Year of Issue</i>
Draft Regulation on Transmission Licensee Standards of Performance	2006
Draft (Third Amendment) Regulation to APERC (Conduct of Business) Regulations 1999	2006
Draft Regulation on amendment to Conduct of Business Regulations	2006
APERC Draft (Terms and conditions for determination of tariff for supply of electricity by a generating company) Regulation	2006
APERC (Interim Balancing and Settlement Code for open access transactions) Regulation	2006
APERC (Levy and collection of fees and charges by state load despatch centre) Regulation	2006
APERC (Intra-state Electricity Trading) Regulation	2005
APERC (Terms and conditions for determination of Transmission Tariff) Regulation	2005
APERC (Terms and Conditions for determination of Tariff for Wheeling and Retail Supply of Electricity) Regulation	2005
APERC (Treatment of Other Businesses of Transmission Licensees and Distribution Licensees) Regulation	2005
APERC (Terms and Conditions of Open Access to Intra-state Transmission and Distribution Networks)	2005
APERC (Levy of fees for various services rendered by the Commission) Regulation	2005
APERC (Transitory Provisions for Determination of Tariff) Regulation	2004
APERC Deemed Licence Conditions Regulation	2004
Regulation on Licensee's Standard of Performance	2004
APERC (Security Deposit to be paid by consumers) Regulation	2004
Regulation on Electricity Supply Code	2004
APERC (Procedure for filing appeal before the Appellate Authority) Regulation	2004
APERC (Licensees' duty for supply of electricity on request and recovery of expenses for providing electric line for electrical plant)	2004
APERC (Constitution of State Advisory Committee and its functioning) Regulation	2004
APERC (Establishment of Forum and Vidyut Ombudsman for redressal of grievances of consumers) Regulation	2004
APERC (Conduct of Business) Amendment Regulations	2000
APERC (Consumer's Right to Information) Regulation	2000
APERC (Standards of Performance in connection with Electricity Supply to Consumers) Regulation	2000
APERC (Appointment and Payment of fees to Standing Legal Counsels) Regulation	1999
APERC (Method of Recruitment and Conditions of Service of officers and staff) Regulation	1999
Regulation on Business Rules of the Commission	1999
APERC (Constitution of Commission Advisory Committee (CAC) and its functions) Regulation	1999

Source: APERC Website: www.ercap.org

Conclusion

- Reforms in the electricity sector of Andhra Pradesh were initiated in 1999 with the establishment of the APERC and unbundling of APSEB into APTRANSCO and APGENCO. Subsequently, in 2000, APTRANSCO was further unbundled into 4 distribution companies (APEPDCL, APCPDCL, APNPDCL and APSPDCL)

- While there has been an improvement in power supply and peak availability position, Andhra Pradesh continues to face deficits on both these fronts.
- The Commission has taken steps to introduce Demand Side Management, Open Access, Multi-Buyer Model (MBM) and Multi-Year Tariffs (MYT). The progress on these measures is as follows:
 - a. The DSM initiatives have mostly concentrated on the agricultural sector through directives to DISCOMs to undertake awareness campaigns. For non-agricultural consumers, the Commission has not yet specified exclusive DSM measures.
 - b. Open Access: The Commission has notified regulations as well as formats for long-term and short-term access agreements. However, there exists limited interest for Open Access at the ground level not only due to structural constraints but also existence of multiple charges on OA consumers.
 - c. Multi Buyer Model (MBM): The GoAP notified the third transfer scheme (provisional) for transfer of rights relating to procurement and bulk supply of electricity and allocation of power purchase agreements (PPAs) from APTRANSCO to the DISCOMs. With this notification, there has been a change in market structure from Single-buyer model to Multi-buyer model. The impact of MBM on the licensees is yet to be ascertained as the same was introduced only in 2005.
 - d. Multi Year Tariffs: In FY 2006-07, the Commission issued the first Multi-Year Tariff (MYT) Order for the DISCOMs considering a control period from FY 2006-07 to FY 2008-09.
- Except for APNPDCL, while the contribution of HT category to total sales of the DISCOMs has increased from FY 2003-04 to FY 2005-06, that of the LT category has shown a downtrend.
- While there has been progress in proportion of metered and agricultural sales in the post-APEREC period, the rate of improvement has been tardy especially in metering of agricultural consumers
- Employee Productivity for the DISCOMs reduced marginally in FY 2004-05 and subsequently showed an uptrend in FY 2005-06. The same trend of productivity was evident for the DISCOMs in case of A&G expenses. For R&M expenses, while APEPDCL witnessed a decline in productivity, there was improvement for APSPDCL.
- In design of the tariff structure, APEREC has aimed to gradually progressively align the tariffs with the Cost of Supply (CoS), especially for the HT category. However, there has been only marginal increase in tariffs for various LT categories. The Commission's initiative of introducing

the 'Incentive Scheme for HT Industry Category' has been highly successful as it has not only helped increase industrial sales and revenues but also brought back industrial consumers back to grid supply.

- On the overall, cost recovery, as measured by the proportion of average realization and average cost has improved for the period under study viz. FY 2003-04 to FY 2005-06.
- Quality of Supply of the licensees, as measured by the DTR failure rate, average frequency and voltage profile, has progressively improved since the formation of the Commission. However, there exists low distribution transformer metering in the state.
- The extent of cross-subsidy, as measured by the Convergence Index, has increased in FY 2005-06 vis-à-vis FY 2004-05
- The Commission currently has well-qualified and adequate staff to look after functions such as Administration, Engineering, Law and Tariffs.
- There are a large number of unresolved cases against the Commission at the Supreme Court and High Court. This indicates that the Commission needs to build greater consensus on key regulatory initiatives.

CHAPTER 3 Assam

Introduction

The Assam Electricity Regulatory Commission (hereinafter referred to as the AERC or Commission) was established under the Electricity Regulatory Commissions Act (ERC Act), 1998 on 28th February 2001. The AERC came into existence in August 2001 and was mandated to exercise the powers and functions conferred under section 22(I) of The ERC Act.

After the enactment of the Electricity Act 2003 (hereinafter referred to as the Act or EA 03) in June 2003, the Commission was mandated to exercise the powers and functions conferred to it under section 86 of the Act. The Commission issued its first tariff order for the Assam State Electricity Board (ASEB) for FY 2002-03. Following this, the Commission issued a combined tariff order for FY 2003-04 and FY 2004-05 in July 2004.

On 10th December 2004, The Government of Assam (GoA) issued a notification to restructure the ASEB by transferring and vesting of functions, properties, rights, obligations and liabilities of ASEB on the State Government and re-vesting thereof by the State Government in the following five corporate entities.

1. **Assam Electricity Grid Corporation Limited (AEGCL)** to carry out the functions of electricity transmission as the State Transmission Utility (STU).
2. **Assam Power Generation Corporation Limited (APGCL)** to carry out the functions of generation of electricity in Assam.
3. **Lower Assam Electricity Distribution Company Limited (LAEDCL)** to carry out the functions of electricity distribution and retail supply in the areas of Guwahati, Mangaldoi, Rangia, Bongaigaon, and Kokrajhar circles of the erstwhile ASEB.
4. **Central Assam Electricity Distribution Company Limited (CAEDCL)** to carry out the functions of electricity distribution and retail supply in the areas of Tezpur, Nagaon, KANCH and Cachar circles of the erstwhile ASEB.
5. **Upper Assam Electricity Distribution Company Limited (UAEDCL)** to carry out the functions of electricity distribution and retail supply in the areas of Dibrugarh, Jorhat, Lakhimpur and Sibsagar circles of the erstwhile ASEB.

The Commission then issued the tariff orders for the FY 2005-06 for the above five entities in May 2005.

Demand supply gap

The power- supply position in Assam has been deteriorating over the years. The deficit in energy requirements was 6.74% in FY 2005-06 as compared to a surplus of 11.21% in FY 2002-03. The peak deficit increased to 7.37% in FY 2005-06 from 5.77% in FY 2004-05.

Movement in Installed Capacity

The installed capacity of power in Assam is primarily thermal and gas based plants, viz. 350.69 MW and 269 MW respectively. Hydro plants constitute only about 0.32% of total, i.e., about 2 MW. The installed capacity was 621.69 MW during the period FY 2000-01 to FY 2003-04 and it increased marginally to 621.81 MW in FY 2004-05. Installed capacity for thermal plants was 350.69 MW for five year period from 2000-01 to 2004-05, for hydro plants it was 2 MW and 269 MW for gas based plants. There was addition of 0.12 MW in FY 2004-05 in other power plants.

There has not been much change in the trend of installed capacity by ownership. In case of state sector, the installed capacity was 597.19 MW in FY 2000-01, which remained same for five-year period ending in FY 2004-05. In case of private sector, the capacity was 24.50 MW, which increased marginally by 0.12 MW in FY 2004-05.

Central sector saw an increase in installed capacity from 320.80 MW in FY 2000-01 to 522.80 MW in FY 2004-05.

FY 2002-03 in retrospect

The Annual Accounts of the ASEB showed the cash operating loss for FY 2002-03 as Rs 281.16 Crore. The details of the same are given in Table 3.1.

Table 3.1: Cash operating losses of ASEB in FY 2002-03

<i>Description</i>	<i>Rs Crore</i>
Expenses	1228.83
Earnings	834.82
Net Loss	394.01
Depreciation	112.85
Cash operating losses	281.16

Source: Annual Accounts of ASEB for FY 2003-04

Consumption and Access

Sales/Demand estimation

The ASEB projected sales for FY 2004-05 based on historical data and power situation in the state. It proposed sales of 2190

MU for FY 2004-05, an increase of 14.8% over FY 2003-04. The Commission approved these sales in the order, though; it did investigate an alternative scenario with lower growth rate based on CAGR of past years.

The actual sales for FY 2004-05 submitted by ASEB in the petition for FY 2005-06 were 1989 MU. The decrease was in the categories of domestic, commercial, bulk, coal and tea, coffee & rubber; while sales to industry increased.

The three Discoms, namely LAEDCL, CAEDCL, and UAEDCL, submitted separate sales forecast to the Commission for FY 2005-06. The total sales projection was 2142 MU. The Commission after analysis of the power availability, system constraints and consumption pattern of the consumers, approved sales of 2203 MU. Table 3.2 gives the proposed, actual and approved figures for sales for FY 2003-04, FY 2004-05 and FY 2005-06.

Table 3.2: Sales for FY 2003-04, FY 2004-05 and FY 2005-06 (MU)

	<i>Proposed</i>	<i>Approved</i>	<i>Actual</i>
FY 2003-04	NA	NA	1907
FY 2004-05	2190	2190	1989
FY 2005-06	2142	2203	2242

Source: Tariff orders issued by AERC

Sales in Assam have shown an increasing trend over the years. The sales grew at a CAGR of 6.53% during FY 1996-97 to FY 2001-01) and at a CAGR of 4.92% during FY 2001-02 to FY 2005-06.

A detailed study on long-term electricity demand forecast is presently being undertaken in Assam by the ASEB and is likely to be finalised soon. This study is has looked at various methods of forecast like trend, econometric (multivariable regression analysis), scenario building and partial end use methods.

Category wise sales

Sales for all consumer categories except industries have shown an increasing trend in the state over the last nine years, i.e., from FY 1996-97 onwards. The major increase has been in the domestic and commercial consumer category. Figure 3.1 shows the movement in sales in major consumer categories over the years.

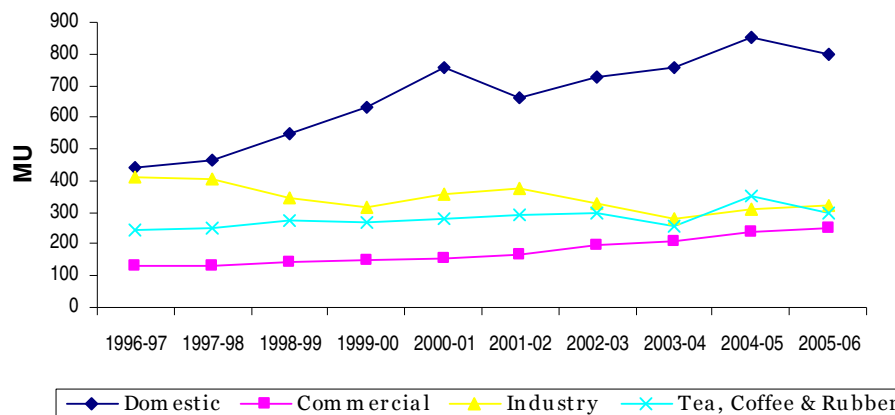


Figure 3.1: Category wise movement in sales

Source: Tariff orders and Annual Statement of Accounts of ASEB

One of the reasons for decrease in sales to industry could be that the category of coal & oil was separated from the industry category in FY 2002-03. However, even the sales to this category is included, the CAGR of industrial consumption is -1.26% between FY 1996-97 to FY 2005-06. The trend of declining industrial consumption has, however, slowed down after FY 2001-02. The CAGR which was -3.34% from 1996-97 to FY 2000-01 came down to -0.74% for the period after that.

The Commission in the tariff order for FY 2004-05, approved the sales as proposed by the Board. However, as mentioned above, it also investigated an alternative scenario of lower sales based on CAGR of 5 years. Comparing this to the actual sales in FY 2004-05, it is seen that the actuals were much closer to this alternative scenario as given in Table 3.3.

Table 3.3: Sales in FY 2004-05 - Proposed, Approved and Actual (MU)

	FY 2004-05 ASEB	FY 2004-05 AERC	FY 2004-05 AERC	FY 2004-05 Actual
		Scenario 1 (approved)	Alternative Scenario 2	
Domestic	855	855	815	791
Commercial	237	237	224	223
General Purpose Supply	52	52	57	52
Public Lighting	6	6	5	6
Public Water Works	34	34	34	33
Irrigation	16	16	17	16
Industries	307	307	272	334
Bulk Supply	264	264	273	238
Tea, Coffee and Rubber	353	353	252	250
Oil & Coal	60	60	42	46
Temporary Supply	6	6	6	1
Total	2190	2190	1997	1990

Source: Tariff orders and Annual Statement of Accounts of ASEB

The actual sales in FY 2004-05 were 9.13% below the approved target of 2190 MU. The total sales were 1990 MU; i.e., 200 MU less than approved; however, the sales to industry increased by 26.91 MU. The Commission in the order for FY 2005-06 expressed concern over this and recognised that lower sales affect the financial health of the utilities by leading to under recovery of fixed costs. It further stated that the entities should make efforts to exceed the targets fixed by the Commission.

For FY 2005-06, the Commission approved slightly higher sales than that proposed by ASEB. However, the detailed reasons for this have were not provided in the tariff order. Table 3.4 gives the proposed and approved sales for FY 2005-06.

Table 3.4: Proposed and approved sales for FY 2005-06

Category	FY 2005-06	FY 2005-06	Change %
	Proposed (MU)	Approved (MU)	
Jeevan Dhara	Not applicable	100	-
Domestic	868	796	3.28%
Commercial	251	250	-0.55%
General Purpose Supply	57	60	4.53%
Public Lighting	7	7	0.86%
Public Water Works	34	34	-0.70%
Irrigation	17	16	-7.51%
Industries	338	322	-4.73%
Bulk Supply	258	275	6.64%
Tea, Coffee and Rubber	270	300	10.98%
Oil & Coal	41	43	5.65%
Temporary Supply	1	-	
Total	2142	2203	2.83%

Source: Tariff orders and Annual Statement of Accounts of ASEB

In the tariff order for FY 2005-06, the Commission introduced a 'Lifeline' category - Jeevan Dhara for the consumers consuming electricity at the lowest level and with low capacity to pay. With the introduction of this category, the Commission directed that rural-unmetered category to be discontinued as all unmetered consumers were to be metered.

In its order for FY 2004-05, the Commission directed the ASEB to report on a quarterly basis the number of un-metered connections and conduct sample load surveys every year of such consumers to check for any increase in connected load/multiple points in their premises. Based on the load survey ASEB was compute a normative level of monthly energy consumption per point beyond which the consumer must shift to the regular metered tariff. No such report was submitted to the AERC as per the order for FY 2005-06.

Number of Consumers and Connected Load

The tariff order for FY 2002-03 and FY 2004-05 does not provide the details on the number of consumers and connected load in the state. The tariff order for FY 2004-05 gives the details of the unmetered consumers circle wise for the domestic, Kutir Jyoti and commercial categories. The total unmetered consumers were 12.34% of the total consumers in August 2003. As mentioned above, the Commission discontinued the rural un-metered category in the tariff order for FY 2005-06.

The total number of consumers has increased from 927794 in FY 2003-04 to 1248975 in FY 2005-06, representing a CAGR of 6.31%. There has not been much change in the category wise composition of consumers with domestic category comprising the maximum. However, its proportion in total sales has fallen from 97% in FY 2003-04 to 75% in FY 2005-06, but this is primarily due to creation of Jeevan Dhara category.

The category wise break up of major consumer categories in FY 2003-04, FY 2004-05 and FY 2005-06 is given in Table 3.5.

Table 3.5: Category wise number of consumers

<i>Consumer category</i>	<i>FY 2003-04</i>	<i>FY 2004-05</i>	<i>FY 2005-06</i>
Jeevan Dhara	-	-	168154
Domestic	901330	958124	933428
Commercial	126717	130382	136205
Industries	9413	9733	10286
Tea, Coffee and Rubber	934	841	902
Others*	21439	22991	26,250
Total	1059833	1122071	1275225

Source: Tariff orders and Annual Statement of Accounts of ASEB

*Others include irrigation, public lighting, Public water works, bulk, oil & coal, tea, etc.

Table 3.6 gives the category wise break up of connected load of major consumer categories in FY 2003-04, FY 2004-05 and FY 2005-06.

Table 3.6: Category wise connected load (kW)

<i>Consumer category</i>	<i>FY 2003-04</i>	<i>FY 2004-05</i>	<i>FY 2005-06</i>
Jeevan Dhara			70598
Domestic	933364	1001659	1060753
Commercial	237578	248132	267004
Industries	291023	312845	368089
Tea, Coffee and Rubber	298336	284272	289946
Others*	278853	286162	358586
Total	2039154	2133070	2414976

Source: Tariff orders and Annual Statement of Accounts of ASEB.

*Others include irrigation, public lighting, Public water works, bulk, oil & coal, tea, etc.

There has been a decline in number of consumers and connected load for the tea, coffee and runner category from FY

2003-04 to FY 2004-05. No reason for this decline has been given in the orders of the Commission.

The present mix of consumers and connected load is the given in Table 3.7.

Table 3.7: Consumer mix and connected load mix

	FY 2005-06	
	Consumer mix	Connected load
Jeevan Dhara	13.19%	2.92%
Domestic	73.20%	43.92%
Commercial	10.68%	11.06%
Industries	0.81%	15.24%
Tea, Coffee and Rubber	0.07%	12.01%
Others		14.85%
Total	100%	100.00%

Source: Tariff orders and Annual Statement of Accounts of ASEB

The above data makes it clear that the highest number of consumers is in domestic category with the highest connected load. Per consumer load is given in the Table 3.8.

Table 3.8 : Per consumer load (kW/consumer)

	FY 2003-04	FY 2004-05	FY 2005-06
Jeevan Dhara	-	-	0.42
Domestic	1.04	1.05	1.14
Commercial	1.87	1.90	1.96
Industries	30.92	32.14	35.79
Tea, Coffee and Rubber	319.42	332.09	321.45
Others	13.01	12.45	13.66
Total	1.92	1.90	1.89

Source: Tariff orders and Annual Statement of Accounts of ASEB

The average connected load per consumer in Assam is 1.90 kW, the highest being that in the Tea, coffee and Rubber industry, one of biggest industry of the state. The load per consumer in commercial and industrial categories appears to be reported on the lower side and therefore reflects the need to accurately assess the load for all categories.

With regards to revenue, the maximum contribution comes from the domestic consumers. Tea, coffee and rubber and industries are contributing almost equally at approximately 16% as shown in Figure 3.2.

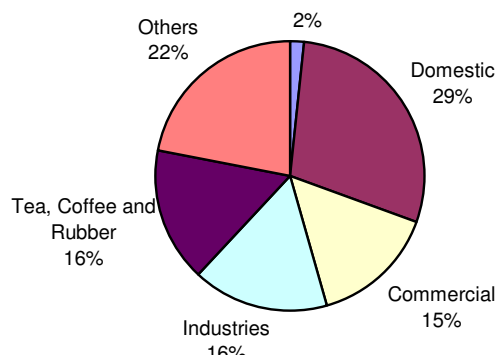


Figure 3.2: Contribution to revenue by major categories
Source: Tariff order for FY 2006-07 (Actual figures)

Table 3.9 gives the revenue per unit of sale for different categories.

Table 3.9: Revenue per unit of sale for different categories

<i>Category FY 2005-06</i>	<i>Revenue</i>	<i>Sales</i>	<i>Rs/kWh</i>
	Rs. Crore	MU	
Jeevan Dhara	14.95	100.00	1.50
Domestic	279.435	796.00	3.51
Commercial	141.77	250.00	5.67
Industries	156.96	322.00	4.87
Tea, Coffee and Rubber	154.8	300.00	5.16
Others	211.455	435.00	4.86
Total	959.37	2,203.00	4.35

Source: Tariff orders and Annual Statement of Accounts of ASEB

The highest realisation per unit of sale is from the commercial consumers followed by Tea, coffee and rubber. The movement in cross subsidy due to tariff realisation is discussed later in this chapter.

Status of rural electrification

Under the Rajiv Gandhi Grameen Vidhyutikaran Yojana (RGGVY) launched by Ministry of Power in April 2005, an amount of Rs.120.74 Crore has been sanctioned to Assam. The scheme covers 23 districts. Table 3.10 highlights the status of rural household electrification in Assam.

Table 3.10: Rural Household Electrification

<i>Total number of rural Households</i>	<i>Households having Electricity</i>	<i>% Electrified Households</i>	<i>Unelectrified Households</i>	<i>% Unelectrified Households</i>
4220173	697842	16.5	3522331	83.5

Source: www.powermin.nic.in

As far as village electrification is concerned, 24% (6043 out of 25124) villages still remain to be electrified in Assam. Under the RGGVY, the DISCOMS have a tentative target of electrifying 140 villages in FY 2006-07¹.

Efficiency improvement

Approach for fixing loss reduction targets

For FY 2003-04 and FY 2004-05, the Commission approved the system losses as filed by the Board at 37.5% and 36.5%. The Commission made it clear that it was accepting 36.5% only for the purpose of computing cost of power purchase. It also directed the ASEB to submit monthly reports (showing category wise the amount of energy sales billed on a metered basis versus that billed on an assessed basis) so that it got better equipped to determine the T&D loss during processing of the next tariff application.

In FY 2005-06, the Commission changed the method of computing overall T&D loss from the method of computation in the previous order. It included trading sales for computing the loss percentage². The Commission approved distribution loss figures for the FY 2005-06 at 25.38%, 32.02% and 30.28% for LAEDCL, CAEDCL, and UAEDCL respectively. The Commission also fixed a target reduction of distribution loss by 1.5% as compared to these for each Discom. The Commission also attempted to incentivise the Discoms by proposing a sharing formula for achievement of this loss reduction. It proposed that if any of the Discoms can achieve this target distribution loss reduction then 50% of the surplus on account of distribution loss reduction will go to the **Development Fund** and the balance is to be refunded to the consumers through the ARR for FY 2006-07. In case, any of the Discoms could achieve a loss reduction figure higher than 1.5%, the Discoms would get to retain the entire amount of surplus revenue on account of this additional distribution loss reduction. None of the Discoms achieved this figure.

¹ Source: Ministry of Power website accessed on November 20, 2006
<http://powermin.nic.in/bharatnirman/progress%20on%20electrification%20of%20villages%20&%20households.pdf>

² The reason behind including trading sales is that the transmission tariff payable to PGCIL amounting to Rs.0.35 per unit is a UCPTT (Unified Common Pool Transmission Tariff). The background of UCPTT is that number of state sector transmission lines are utilised for wheeling central sector energy from CSGS to other constituent states of the North East Region. All energy accounting of CSGS is done on the basis of Energy Sent Out of respective generators. The Commission therefore is of the opinion that total energy available after deducting central loss should be considered as total energy available for sale. All export of energy outside the region is delivered at the interregional point at 220/400 kV Bongaigaon Bus.

The losses increased at a CAGR of 7.36% during the 5 year period prior to the establishment of the AERC (FY 1996-97 to FY 2000-01) and at (-) 7.46% after it was set up. Figure 3.3 shows the T&D losses in Assam from FY 1996-97 to FY 2006-07 (approved numbers).

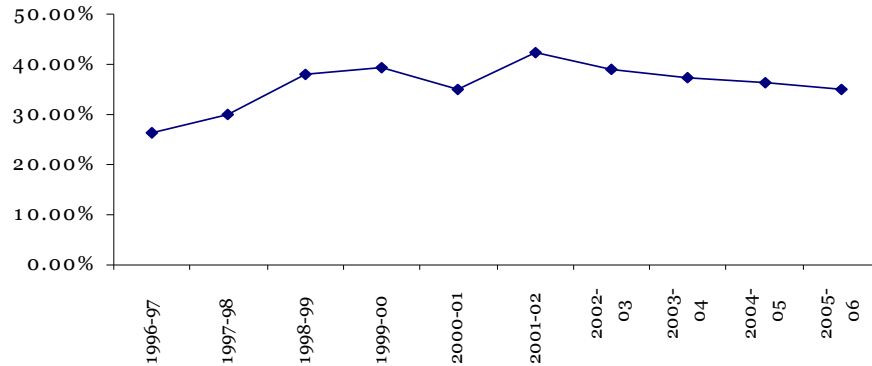


Figure 3.3: T&D loss in Assam from FY 1996-97 to FY 2006-07

Source:

- (i) Tariff orders for FY 2004-05 and FY 2005-06
- (ii) Annual Report on the working of SEBs (2001). Planning Commission, GoI

Table 3.10 gives a comparative view of the loss approved by the AERC in its first tariff order, vis-à-vis the actual loss had and approved loss in subsequent tariff orders.

Table 3.10: Multi-year T&D loss reduction targets

	FY 2002-03	FY 2003-04	FY 2004-05	FY 2005-06	FY 2006-07
% loss level (AERC approved in FY 2002-03)	40%	38%	36%	34.5%	33%
Expected % loss level (proposed by ASEB in FY 2003-04)	41%	38%	36.5%	35%	29.5%
Approved in tariff orders		37.5%	36.5%	34.92%	32.08%
Actuals	39.07%	36.29%	39.90%	35.67%	NA

Source: Tariff orders issued by AERC

The above table makes it clear that the Commission had to change its estimates during the last 3 years as compared to the levels approved initially. This was primarily due to delays in implementation of the APDRP funded schemes in the state. The actual loss for FY 2004-05 was 39.90%, much higher than the loss the previous year. The Commission took note of this and directed the petitioner to curb its losses.

Collection Efficiency

The Commission in order for FY 2004-05 did not set definite targets for improvements billing and collection efficiency as it considered that it would be unrealistic to set arbitrary targets without detailed analysis of the various issues involved. It also stated that at that time it was handicapped by non availability of staffs to undertake such analysis.

The petitioners in their petitions for FY 2005-06 submitted the collection efficiencies for FY 2004-05 as given in Table 3.11.

Table 3.11: Collection efficiencies for the DISCOMS

<i>DISCOM</i>	<i>Collection efficiency</i>	
	FY 2004-05 Actual	FY 2005-06 Proposed
LAEDCL	91.28%	95%
CAEDCL	84.38%	95%
UAEDCL	94.77%	95%

Source: Tariff petition for FY 2005-06

In the order for FY 2005-06, AERC directed that the annual average monthly billing efficiency¹ and the annual average monthly collection efficiency² should not be less than 95%. It also directed the Discoms to furnish a quarterly report on the collection efficiency achieved with effect from July 2005 indicating action taken in respect of units where the collection efficiency is lower for informing the consumers the names of the units and of the officers in their charge.

The petitioners in the petition for FY 2006-07 submitted that the collection efficiency for July 2005 was 95%. They submitted that they have taken the following actions to achieve this:

- Regular disconnection drive against non-payment of dues is being made effective.
- Disconnection prioritisation is being based on the amount and/or age of arrears and accordingly different kinds of notices are being issued to the defaulting consumers.
- Introduction of spot billing for domestic, commercial and small and medium industrial consumers.
- Introduction of Automated Meter Reading will not only improve billing but also shorten the revenue cycle time from consumption to billing and collection and thus improve collection efficiency.
- Opening time of some Cash Counters have been advanced to 9.00 am during working days.

¹ Monthly billing efficiency = Number of consumer billed during the month divided by the number of consumers served by the licensee at the beginning of the month

² Monthly collection efficiency=Amount realized divided by the amount assessed during the month

- Cheque drop facilities have also been introduced in some locations.

The petitioner submitted that they would gradually be extended further to improve the collection efficiency to a great extent. All concerned field units have been directed to take up vigorous disconnection drives and to collect arrears & achieve more than 100% in collection efficiency. Sub Divisional level consumer committees have been formed and communication with consumers has also been improved through setting up of customer care centres.

However, the billing efficiency of the licenses continues to remain poor. The billing efficiency for the three distribution companies is given in Table 3.12.

Table 3.12 Billing efficiencies for the DISCOMS

DISCOM	Billing efficiency		
	FY 2004-05	FY 2005-06	FY 2006-07 (upto August 2006)
LAEDCL	67%	69%	70%
CAEDCL	61%	61%	65%
UAEDCL	61%	63%	65%

Source: Presentation on Assam in the APDRP North East Regional Review Meeting, Shillong, 27th October 2006

AT&C losses

The overall AT&C losses for the three distribution utilities are given in Table 3.13.

Table 3.13 AT&C losses for the DISCOMS

DISCOM	AT&C loss		
	FY 2004-05	FY 2005-06	FY 2006-07 (up to August 2006)
LAEDCL	37%	30%	39%
CAEDCL	45%	42%	34%
UAEDCL	41%	38%	36%

Source: Presentation on Assam in the APDRP North East Regional Review Meeting, Shillong, 27 October 2006

Metering

The AERC in its order for FY 2002-03 directed the ASEB to provide circle wise break up of transmission and commercial losses and the plan for 100% metering and T&D loss reduction.

The Board also submitted a commercial and technical Losses action plan with its petition for FY 2004-05. It had proposed to replace 190000 electronic meters at the cost of Rs 39.96 Crore by March 2005 and provided the Commission with a circle wise scheme of the replacement programme. It also submitted that it was planning an investment of Rs 512 Crore under APDRP for

improvement in sub-transmission and distribution system staggered over five years (FY 2003-04 to FY 2007-08).

The Board also submitted the details of the ADB Restructuring Program, under which it was to install 6,00,000 meters (60,000 for conversion of un-metered consumers, 2,40,000 for replacement of electro-mechanical meters and defective meters of all registered consumers, and 3,00,000 for un-registered/prospective consumers) December 2006. It also submitted to have computerized billing system in all circles by May 2005. ASEB also submitted a list of projects undertaken for improvement in transmission system including installation of new transmission lines, new sub stations and augmentation of the existing sub stations, rehabilitation and installation of transmission grid communication system namely PLCC system at 220 kV and 132 kV sub stations and installation and modernization of relays and protection systems and replacement of switchgears.

The Commission also directed the Board to provide quarterly progress reports on the progress on APDRP and ADB funded scheme. The FY 2005-06 order stated that this report was not submitted to the Commission. The Board was also to ensure downloads and analysis for all HT consumers and submit a report on number of HT consumers, number of MRI downloads, number of cases where discrepancies found, amount of additional bills raised, collections against such bills and action taken to prevent such cases. The FY 2005-06 order stated that these reports were not submitted to the Commission.

At present, all 11 kV meters in Assam are metered. The metering of distribution transformers is scheduled to be completed by December 2006 and consumer metering by December 2007. At present, only 7% of the total distribution transformers, 1528 out of a total number of 21980 are metered. The status of consumer metering is given in Table 3.14.

Table 3.14: Status of consumer metering (in lakhs)

	<i>Numbers</i>	<i>Metered</i>	<i>Percentage metered</i> %
FY 2004-05	11.77	10.56	90
FY 2005-06	12.74	12.09	95

Source: www.powermin.nic.in

Fuel Cost for Power Generation

For FY 2003-04 the Board filed Rs.68.4 Crore as fuel cost for own generation. The Commission for the FY 2003-04 approved the actual cost incurred in fuel for generation of power during that period. The actual cost incurred was estimated by using the

information filed in the PPFCA filing for the first three quarters for the relevant year. This came out to be Rs.59.27 Crore.

For FY 2004-05 the petitioners filed Rs.70.55 Crore as fuel cost for power generation but the Commission in its order for the same year approved only Rs.68.48 Crore. In FY 2005-06 APGCL filed Rs.75.13 Crore as cost under this head, which was approved by the Commission on normative basis. The main components that impact the generation cost are plant load factor, station heat rates, and auxiliary power consumption.

1. Plant Load Factor (PLF)

For FY 2003-04 and FY 2004-05 this norm is not considered because of lack of gas availability. For FY 2005-06, the Commission in its order fixed the norm at 50% availability for the full recovery of the fixed costs and target of 50% PLF for the incentive payment.

2. Gross Station Heat Rates (SHR)

In the FY 2003-04 and FY 2004-05 the Commission did not fix any norm for this factor due to absence of required detailed information from the petitioner and the amount proposed by petitioners was accepted as norm. For FY 2005-06, the Commission in its tariff order fixed the following norms:

- For new gas turbine/combined cycle generating stations:
 - i. Open cycle: 2830 kCal/kWh
 - ii. Combined cycle: 1950 kCal/kWh
- For the existing NTPS and LTPS plant:
 - i. NTPS (Filed): 3480 kCal/kWh
 - ii. LTPS (Filed): 3760 kCal/kWh

3. Auxiliary Power consumption

In tariff petition for FY 2003-04 and FY 2004-05, the ASEB suggested that auxiliary consumption at 5% (weighted average) should be applied on the combined gross generation of NTPS and LTPS. The Commission compared the auxiliary consumption as per CERC norms and approved the auxiliary consumption at 5.2% of the gross generation in its tariff order for relevant years. In the FY 2005-06 petition, the APGCL suggested rates of 4.8% for NTPS and 6.9% for LTPS. The commission in its order has approved auxiliary consumption at the rate of 4.5% for NTPS and 5.5% for LTPS as per The CEA norms.

The approved amounts as a percentage of ARR is lower than the filed amount in all three years. The increase in fuel cost from FY 2003-04 to FY 2005-06 is 9.8% as estimated by petitioners.

However the increase as approved by the Commission is in order of 26.7% in FY 2005-06 as compared to the amount in FY 2003-04.

Power Purchase and own generation cost

The various sources of power purchase, units purchased and the total power purchase cost have been summarized in Table 3.15.

Table 3.15: Power purchase details

Sources	MU (Approved)			Rs. Crores		
	2003-04*	2004-05	2005-06	2003-04	2004-05	2005-06
Free Power	-	72.10	-	-	-	-
Khandong & Kopili HEP	440.94	469.96	557.00	20.72	32.80	33.61
Loktak HEP	130.50	115.18	115.00	13.60	11.66	10.39
Doyang HEP	23.85	90.48	80.00	8.83	18.98	18.57
Rangana HEP	491.67	737.47	649.00	81.38	82.29	88.25
Assam Gas PP	716.05	1,110.79	1,096.00	145.12	198.34	197.74
Agartala GT	323.30	258.84	255.00	59.89	44.05	43.46
DLF	130.55	135.00	140.00	46.93	33.05	30.06
MeSEB	12.93	7.80	8.00	2.03	2.03	2.46
APGCL*	-	-	893.80	-	-	75.13
Trading Purchases	447.67	300.00	103.28	92.77	61.50	34.08
PGCIL (NER) Charges	-	-	-	73.37	99.92	-
PGCIL (ER) Charges	-	-	-	1.17	-	96.32
Other Charges	-	-	-	(11.49)	-	-
NRDLC Charges	-	-	-	1.58	1.63	1.60
Total	2,717.46	3,297.62	3,897.08	535.90	586.25	631.67
Less: Transmission losses	53.58	110.20	104.58	-	-	-
CGS/PGCIL Net Power Available	2663.87	3187.42	3792.50	535.90	586.25	631.67
Own generation				59.27	68.48	
				595.17	654.73	631.67

*Only fuel cost

Source: Tariff orders issued by AERC

As can be seen, there has been an increase in units purchased and the purchase costs in FY 2005-06 from previous years. For FY 2003-04 and FY 2004-05, the Commission approved Rs.535.9 Crore for FY 2003-04, as it was the estimated actual cost incurred in that year and Rs.586.25 Crore for FY 2004-05 as the power purchase cost. In FY 2005-06, the ASEC acts as the bulk supply trader. This includes the purchase of electricity from APGCL, other generators in Assam, the CSGS, and power traders and the supply of electricity to the three Discoms. In FY

2005-06, the Commission approved Rs.631.67 Crore (including subsidy support) under this head.

Trading and UI

The details of trading and UI transaction in FY 2005-06 in Assam are given in Table 3.16.

Table 3.16: Details of Trading and UI transaction in FY 2005-06

<i>Details</i>	<i>MU</i>	<i>Rs Crore</i>
Trading – purchase @ Rs 3.30/kWh	262.70	85.70
Trading – sale @ Rs 2.58/kWh	278.93	66.86
Net trading	(16.23)	18.84
UI-purchase	103.48	16.26
UI-sale	0	0
Net UI	103.48	16.26

Source: Annual Accounts of ASEB

Employee cost

In FY 2003-04, the AERC approved the approved employee costs as proposed by the Board, i.e., Rs.284.9 Crore. For FY 2004-05, it approved Rs.298 Crore as against Rs.330 Crore proposed by ASEB which represents an increase of 4.63% over the level approved for FY 2003-04. For FY 2005-06, the Commission allowed for a special charge on BST-terminal benefits liability which is calculated on the basis of special BST @ 0.20 paise per kWh. The amount proposed by ASEB was Rs. 60.56 crores and the Commission approved Rs. 25.39 crores for the same. Including this, the total employee cost approved for FY 2005-06 is Rs.325.78 Crore as compared to Rs 364.26 proposed by the petitioners for whole of ASEB together. The ASEB had got a detailed actuarial valuation study to estimate the cash outflow on account of terminal liabilities for FY 2004-05. The utilities also submitted that to meet the terminal benefits on account of future services rendered by the existing employees, the new companies will contribute to the Pension fund.

The Commission gave the break up of employee costs into its various components for FY 2003-04 and FY 2004-05. For FY 2005-06, it only gave the consolidated approved amount which was an increase of 8% over the FY 2004-05 levels. In doing this, the Commission had considered normal inflation adjustment of 5% and kept an extra cushion of 3% to recover any contingency.

Table 3.17 gives the comparison of proposed, approved and actual employee costs over the last three years.

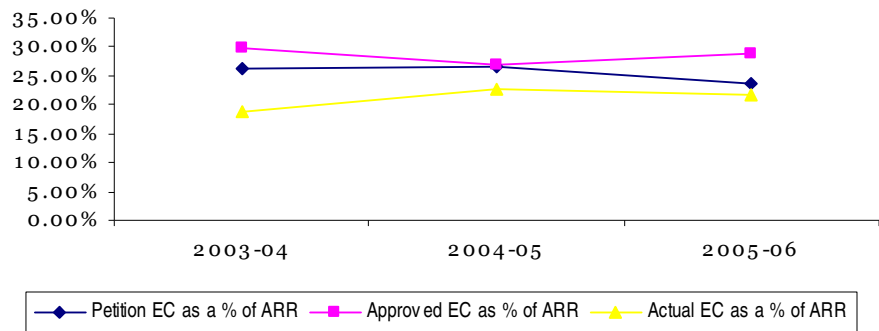
Table 3.17: Employee costs (proposed, actual and approved)

<i>Rs. Crores</i>	<i>2003-04</i>	<i>2004-05</i>	<i>2005-06</i>
Petition EC	284.90	330.45	364.26
Petition EC as % of ARR	26.25%	26.71%	23.51%
Approved EC	284.90	298.09	325.78
Approved EC as % of ARR	29.67%	26.75%	29.00%
Actual EC	263.24	322.24	306.62
Actual EC as a % of ARR	18.66%	22.84%	21.73%

Source: Tariff orders issued by AERC

Employee Productivity

The approved employee costs have increased by 14.35% over the years FY 2003-04 to FY 2005-06. The trend in employee costs as a percentage of total ARR is shown in Figure 3.4.

**Figure 3.4:** Employee productivity

Source: Tariff orders issued by AERC

Actual employee costs as a proportion of total ARR of the companies is showing a reducing trend.

Table 3.18 gives the trend in employee cost per unit of sale over the years.

Table 3.18: Employee cost per unit of sale

<i>Year</i>	<i>Employee cost per unit of sales (paise/unit)</i>
FY 2003-04	149.40
FY 2004-05	136.11
FY 2005-06	147.88

Source: Tariff orders issued by AERC

Table 3.18 shows that though the employee cost per unit of sale declined in FY 2004-05, it has increased again in FY 2005-06,

this is primarily due to provision made in BST for terminal benefits.

Figure 3.5 shows the trend in two parameters of employee productivity:

- (a) number of employees per thousand consumers
- (b) number of employees per million kWh sold

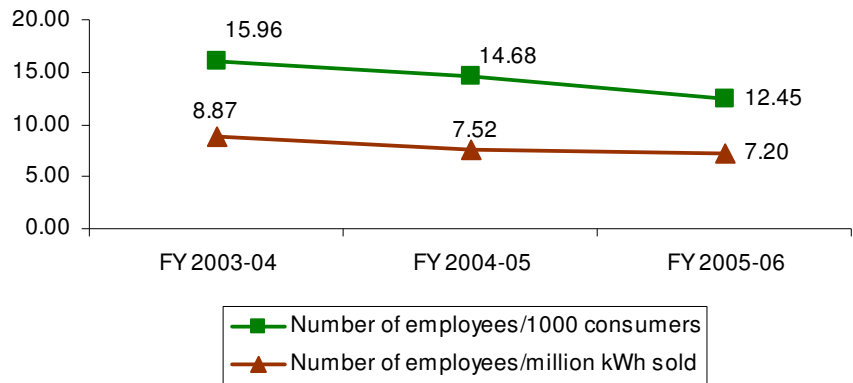


Figure 3.5: Trends in employee productivity

Source: Tariff orders issued by AERC

Table 3.19 gives the revenue per employee for FY 2003-04, FY 2004-05 and FY 2005-06.

Table 3.19: Revenue per employee

Year	Number of employees	Revenue	Revenue per employee
		Rs Crore	Rs/employee
FY 2003-04	16910	894	528924
FY 2004-05	16471	944	573025
FY 2005-06	15871	959	604480

Source: Tariff orders issued by AERC

All the above parameters show a declining trend which represents improving employee productivity. However, this is also due to the reason that fresh recruitment had been frozen for a few years in the Board and it is only recently that some engineers have been recruited.

Repair and Maintenance Expenses

The Commission approved the R&M costs as submitted by the ASEB for FY 2003-04 and FY 2004-05, i.e., Rs 21.94 Crore and Rs 22.99 Crore respectively. This represented an increase of 10.53% in FY 2003-04 and 4.79% in FY 2004-05. The Commission recognised that adequate R&M is needed to improve the quality of supply. However, the ASEB incurred only Rs 15.81 Crores on R&M in FY 2003-04 which is lower than the

approved amount. In FY 2005-06, the Commission has approved Rs 28.63 Crore for R&M and the ASEB in its petition for FY 2006-07 has submitted that it has spent this amount on R&M in FY 2005-06. Table 3.20 gives the proposed, approved and actual R&M expenditure over the years.

Table 3.20: R&M expenses (Proposed, approved and actual)

Year	Proposed	Approved	Actual
FY 2003-04	21.94	21.94	15.81
FY 2004-05	22.99	22.99	22.99
FY 2005-06	28.63	28.63	28.62

Source: Tariff orders issued by AERC

Figure 3.6 highlights the R&M expenditure as a percentage of the opening gross fixed asset over the years (approved figures).

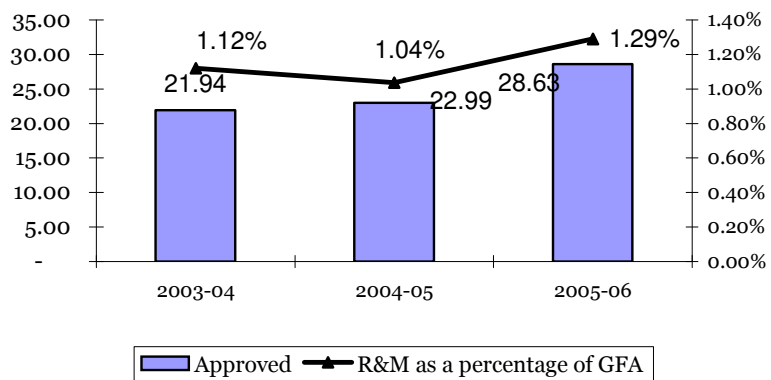


Figure 3.6: Repair & maintenance expenditure as a percentage of gross fixed assets
Source: Tariff orders issued by AERC

The level of R&M expenses for ASEB ranges between 1 to 2% of opening GFA.

Administration and General Expenses (A&G expenses)

Administration and General expenses in Assam mainly constitute of rents, rates & taxes, conveyance, other expenses and freight charges and they vary considerably from year to year. For such expenditure that are less than 5% of ARR, the Commission for FY 2003-04 and FY 2004-05, approved an annual escalation of 5% over the actual expenditure of FY 2002-03.

For FY 2005-06, the Commission approved an annual escalation of 6% taking FY 2003-04 as the base year. The reason given by Commission for relying on FY 2003-04 figures was that this is the latest available audited figure. While allowing 6% increase, the Commission took into account normal inflation at the rate of 5%, and 1% cushion to take care of additional expenditure. For FY 2005-06, a total of Rs. 5 Crore was proposed as a one-off cost (Rs. 1 Crore per company) to fund the cost of setting up infrastructure

and services for the new companies which the Commission denied due to lack of any detailed justification for the expenditure. Table 3.21 gives the proposed, approved and actual A&G expenditure over the years.

Table 3.21: A&G expenses (proposed, approved and actual)

Year	Proposed	Approved	Actual
FY 2003-04	10.02	13.03	13.19
FY 2004-05	15.68	13.68	15.68
FY 2005-06	20.90	14.86	20.03

Source: Tariff orders issued by AERC

Figure 3.7 gives the A&G expenses as per unit of sale (paise/kWh) and as a percentage of total ARR.

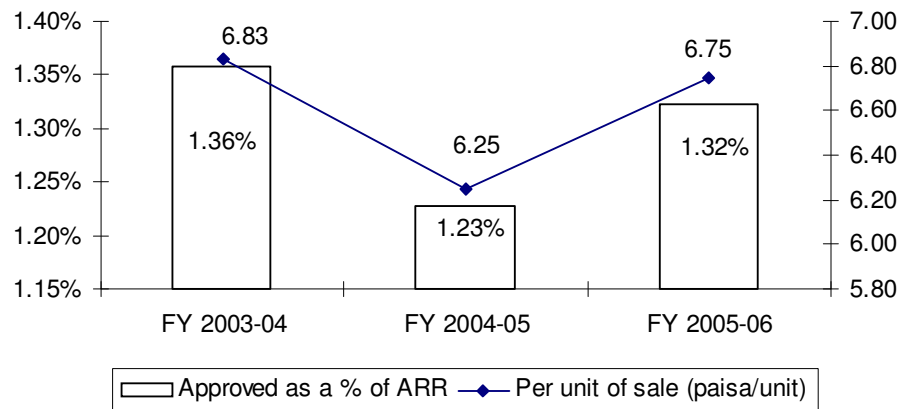


Figure 3.7: A&G expenses as percentage of ARR and per unit of sale

Source: Tariff orders issued by AERC

The A&G expenses declined in FY 2004-05 but again show an increasing trend in FY 2005-06, primarily due to the Commission allowing 6% increase on FY 2003-04 as the base year, whereas, in FY 2003-04 and FY 2004-05 it had allowed only 5%.

Total Operating expenditure (Employee costs, R&M and A&G expense)

The operation and maintenance cost primarily consists of three major heads, namely employee costs, repair and maintenance costs and administration and general expenses. Table 3.22 gives a consolidated picture of the movement in O&M expenditure over the years.

Table 3.22: Operating expenditure over the years

Year	Proposed	Approved	Actual	per unit of sale	% of ARR
FY 2003-04	316.86	319.87	292.24	167.73	33.31%
FY 2004-05	369.12	334.76	360.91	152.86	30.04%
FY 2005-06	413.79	369.27	354.85	167.62	32.87%

Source: Tariff orders issued by AERC

The O&M expenses have been in the range of 30-33% during the period of analysis of this study. The O&M costs prior to establishment of AERC were also constant at around 23% of ARR. However after FY 2001-02, i.e., the share of O&M costs have increased significantly.

Depreciation

The Commission in the order for FY 2004-05 limited depreciation to the extent of repayment of principal portion of the loan repayment during FY 2003-04 and FY 2004-05. It further stated that the proportion of amount not allowed by it could be sourced. The Commission approved only Rs.7.02 Crore in FY 2003-04 as compared to proposed amount of Rs.33.77 Crore and Rs.8.15 Crore in FY 2004-05 as compared to Rs. the amount proposed by the petitioners of Rs.113.25 Crore that was to be applied towards repayment of loans.

In FY 2005-06 also the Commission followed the same approach. The companies could not produce the following information that was required by the Commission to undertake a detailed analysis of depreciation:

1. Assets Registers
2. Value of assets which have been fully depreciated (upto 90% of original cost)
3. Rate of depreciation vis-à-vis value of each category of assets for the purpose of computing the depreciation

The Commission also introduced a development fund in FY 2005-06 to be used for replacement of assets and to avoid a situation where the existing assets cannot be replaced. It approved Rs.35.30 Crore as against the proposed amount of Rs.118 Crore for inclusion in tariff determination.

Table 3.23 gives the comparison of the proposed, approved and actual depreciation amount

Table 3.23: Details of depreciation

<i>Year</i>	<i>Proposed</i>	<i>Approved</i>	<i>Actual</i>	Basis
FY 2003-04	33.77	7.02	117.58	Linked to repayment portion of loan in the year
FY 2004-05	113.00	8.15	113.25	
FY 2005-06	118.00	35.30	35.3	

Source: Tariff orders issued by AERC

Sources of Funds

Accelerated Power Development & Reforms Program (APDRP)

Assam is divided into 14 revenue circles for implementation of the above scheme. All the 14 circles have approved DPR's. Original approved DPR cost for 12 circles was Rs.408.54 Crore. The sanctioned amount was later revised to Rs.650.73 Crore and all projects under the scheme have started. Rs 294.11 Crore have already been released so far and Rs 70.77 Crore are in the pipeline. 10% of the state share, Rs 65.07 Crore in the scheme is being organised through Financial Institutions and out of this Rs 47.62 Crore has already been received. The balance amount, i.e., Rs 268.40 Crore is to come in FY 2006-07. Figure 3.8 gives the circle wise sanction of funds.

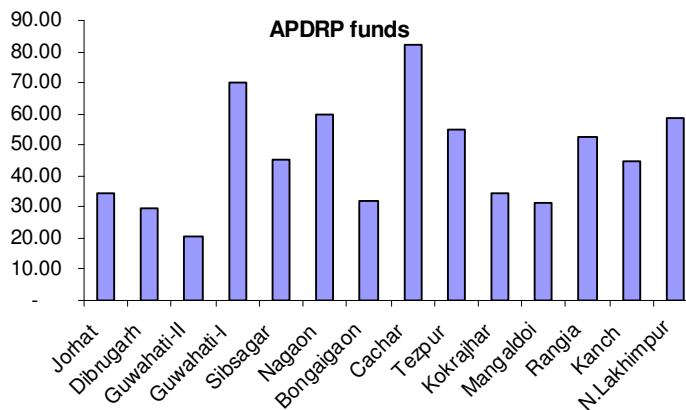


Figure 3.8: Circle wise sanction of APDRP funds in Assam

Source: www.powermin.nic.in

Assam Power Sector Development Program Funded by ADB

The objective of the project is to improve the quality and quantity of electricity supply by strengthening transmission and distribution systems, introduce revenue management system; and rehabilitating rural distribution network. The total amount sanctioned under this project is US \$100 million.

Status of PFC lending

The status of PFC lending in Assam as on October 5, 2006 is given in Table 3.24.

Table 3.24: Status of PFC lending (Rs Crore)

Utility	Total Sanction	Total disbursement
AEGL	20.30	12.39
AERC	0.050	005
APGCL	32	-
ASEB (trader)	219.83	184.15

Interest and Finance Charges

The Board for FY 2003-04 submitted interest and financing¹ charges of Rs.88.94 Crore and Rs. 73.94 Crore for FY 2004-05. This was net of capitalisation. The Commission approved Rs.34.17 Crore and Rs 51.78 Crore respectively. For FY 2005-06, the petitioners filed Rs. 57.24 Crore under this head whereas the Commission approved Rs.60.56 Crore since it provided for interest on security deposits also. Table 3.25 gives the interest and finance charges proposed and approved including interest on term loans, interest on working capital, security deposit and bank charges.

Table 3.25: Details of interest and finance charges has been summarized below:

Interest & Finance charges	Filed (Rs. Crore)			Approved (Rs. Crore)		
	2003-04	2004-05	2005-06	2003-04	2004-05	2005-06
Interest on Term Loan	59.10	39.46	52.44	5.07	21.87	51.06
Interest on Working Capital	8.93	8.18	18.62	-	-	18.89
Interest on Security Deposit	23.26	27.21	-	22.98	29.91	4.72
Bank charges	2.64	3.02	4.80	2.64	3.02	4.80
Others	3.94	4.25	-	3.48	(3.02)	-
Total	97.87	82.12	75.86	34.17	51.78	79.47

Y

Source: Tariff orders issued by AERC

In FY 2005-06 the approved amount increased significantly i.e., by 53% as approved by the Commission. This is due to the fact that in FY 2003-04 and FY 2004-05 the Commission did not allow interest on working capital whereas in FY 2005-06 it allowed an amount of Rs 18.9 Crore as interest on working capital.

Provision for Bad and Doubtful Debts

For FY 2003-04 the Board did not propose any amount for doubtful debts and for FY 2004-05, it proposed an amount of Rs.22.96 Crore (2% of gross revenue). In the tariff order for FY 2004-05, the Commission disallowed any amount to be passed as bad debts and stated that ASEB must actively pursue recovery of past dues. It further maintained that it will allow recovery of bad debts if the ASEB proposed to write off the same from their accounts.

In FY 2005-06, the petitioners filed Rs.35.71 Crore as expenses under this head and the Commission allowed Rs.24.65 Crore to be set aside as Provision for bad and doubtful debts. The Commission recognised that this was needed from the very first

¹ excluding interest on working capital

year of operation of the new companies and therefore allowed for 2.5% of ARR to be set aside as provision and bad debts as against its Regulations that provide for this @1% of total revenue. The reason given for this was losses may occur due to the heavy collection drive that the licensees would take involving waivers as incentive for payments.

Table 3.26 shows the comparison of proposed, actual and approved bad debts.

Table 3.26: Bad and doubtful debts (Proposed, approved and actual) (Rs Crore)

<i>Year</i>	<i>Proposed</i>	<i>Approved</i>	<i>Actual</i>
FY 2003-04	0.00	0.00	NA
FY 2004-05	22.96	-	NA
FY 2005-06	35.71	24.65	24.2

Source: Annual Accounts of ASEB and Tariff orders issued by AERC

Rate of Return

The ASEB did not file any amount as return for FY 2003-04. The Commission however in its order approved a marginal amount under this category, namely Rs.3.41 Crore. The ASEB filed for 3% statutory return in FY 2004-05, which was approved by the Commission. For FY 2005-06 the petitioners proposed a 16% return on equity as per the transfer scheme notified by GoA. Because of the poor performance of licensees in FY 2004-05, the Commission did not allowed any return on equity in FY 2005-06 by applying a rate of zero return on equity.

Annual Revenue Requirement (ARR)

For FY 2003-04 the Board submitted an amount of Rs.1048.75 Crore as ARR. The Commission approved only Rs.894.41 Crore after in-depth review of all cost items. For FY 2004-05 the Board estimated Rs.1205.53 Crore as the ARR. The Commission approved Rs.966.12 Crore after reviewing each cost item. The Commission approved an increase of 8% in the ARR for FY 2004-05 over FY 2003-04. In the FY 2005-06 each company filed separate ARR requirements with the Commission. For the purpose of this analysis, the ARRs of all the utilities have been clubbed to facilitate comparison with previous years.

Table 3.27: ARR (proposed and approved) for FY 2003-04, FY 2004-05 and FY 2005-06 (Rs Crore)

Items	FY 2003-04 Petition	FY 2004-05 Petition	FY 2005-06 Petition	FY 2003-04 Approved	FY 2004-05 Approved	FY 2005-06 Approved
Power purchase cost + own generation	613.57	628.91	681.37	595.17	654.73	680.35
Employee cost	284.90	330.45	364.26	284.90	298.09	325.78
Repairs and Maintenance cost	21.94	22.99	28.63	21.94	22.99	28.63
Administration and General expenses	10.02	15.68	20.90	13.03	13.68	14.86
Interest & Finance charges	97.87	82.12	75.86	34.17	51.78	81.56
Depreciation	33.77	113.25	118.00	7.02	8.15	35.30
Provision for Doubtful Debts	0.00	22.96	35.71	0.00	-	24.65
Past Liability/Carry forward losses	23.13	0.00	35.72	0.50	44.17	2.09
Return	0.00	20.93	67.03	3.41	20.93	0
Development surcharge						30
Total Expenditure	1085.20	1237.29	1549.11	960.14	1,114.52	1,123.45
<i>Less:</i>						
Miscellaneous receipts	36.95	31.76	97.60	65.72	148.41	162.02
Net ARR	1048.25	1205.53	1451.51	894.42	966.11	961.43

Note: The figures for FY 2005-06 include wheeling charges to be paid to AEGCL, but do not include fixed cost of APGCL which are included in other cost parameters to allow comparative analysis over the years. It also includes the subsidy of Rs 49 Crores received as GoA support. The net power purchase and own generation costs would therefore be Rs 631 Crore.

Source: Tariff orders issued by AERC

Figure 3.9 gives the trend in ARR (without subsidy from GoA) from FY 2003-04 to FY 2004-5

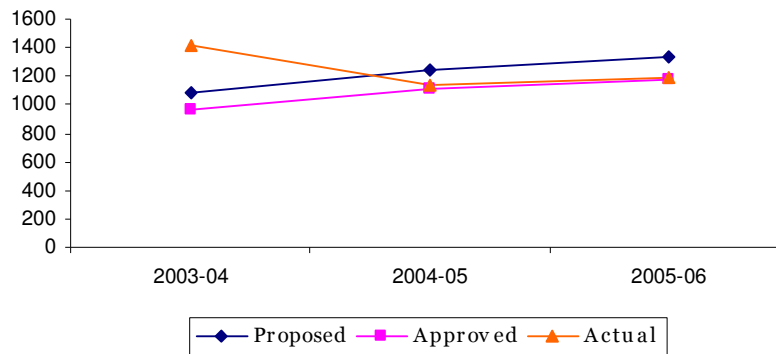


Figure 3.9 Trends in ARR

Source: Tariff orders issued by AERC

Figure 3.9 shows that the actual ARR being incurred by the utility is coming down. This is primarily due to reduction in loss level.

Tariff Rate Balancing

Tariff Rationalization

The ASEB submitted that it had followed the following main principles of tariff rationalization in its proposal for FY 2004-05:

- Recovery of full average cost of supply without taking into account any subsidy or subvention from the State Government
- Gradual reduction of cross subsidies
- Introduction of TOD tariff for HT-I Industrial consumers
- Setting up a formula for determining Multi-year Tariff
- Increase in fixed charge to bring it nearer to the level of actual fixed component of the average cost of supply.

The Commission attempted to rationalise the fixed charges by the following two methods:

- Increasing the level of fixed charge component (for categories with low fixed charge like industry, commercial etc)
- Linking fixed charges to availability (for categories with high fixed charge like tea, coffee plantations, oil and coal)

The Commission also emphasised on the need for ASEB to improve its efficiency and on gradual reduction in tariffs. The Commission continued with its decision of removal of minimum charges to further rationalize the tariff structure taken in the first tariff order.

The ASEB had proposed for implementation of a mechanism for multi-year tariff for FY 2003-04 and FY 2004-05. The Commission recognised the need and importance for such a mechanism but it did not introduce the same in FY 2004-05 and FY 2005-06. In FY 2004-05, it introduced the benefit sharing mechanism where ASEB was allowed to retain upto 50% of the financial gain arising out of efficiency improvement. This sharing of benefits was to be invoked only after the ASEB has completely provided for all costs including depreciation.

The benefit of the remaining 50% of the excess gains (that has not been retained by ASEB) was to flow to the consumers in the next year as a reduction in the ARR of ASEB. The net efficiency gains achieved by ASEB will be a combination of reduction in costs and increase in revenues. The Commission also stated that it did not intend to follow an intrusive form of regulation by directing the efforts of ASEB and left it to the ASEB to formulate and implement strategies as per their understanding of the sector.

In May 2006, the AERC issued the Assam Electricity Regulatory Commission (Terms and conditions for determination of Tariff) Regulations 2006 that provide the MYT mechanism for the entities the Commission expects that the next tariff order would be based on these regulations. The regulations have defined the control period of generation as 5 years, 3 years for transmission & distribution (from 1st April 2006). The regulations also detail out the operation norms for power plants and the general principles of revenue and sharing of efficiency gains for the licensees or generating companies.

New initiatives in tariff design

1. In the tariff order for FY 2005-06 the Commission divided all categories into broad two groups, namely, Low Tension (LT) and High Tension (HT). The objective as stated by Commission was to provide for common benefits to both with an aim of reducing T&D Loss by encouraging consumers to shift to higher voltage option.
2. **Time of Use (ToU) Tariff:** H.T industries, Tea, coffee & rubber and Oil & coal already had a ToU tariff in Assam. The Commission used the data submitted by ASEB in the filing to compute the ToD tariff and assumed that the off peak charges are 95% of the base tariff. The charge for consumption during peak period was computed at a level that fully recovered the revenue from base tariffs. The Commission in FY 2004-05 order approved only a two time period (peak and off peak). It did not agree with the filing of ASEB which has proposed three time periods. It gave the reason that Assam's night time demand is not significantly lower than day time off peak demand. However, it introduced the three-tier ToD tariff in FY 2005-06.

The Commission in FY 2004-05 order directed the ASEB to submit an action plan that lists out the ground issues for implementation of ToU charges for other categories and to estimate the time and money that will be required to upgrade the metering at consumer premises and an ABC analysis based on which ASEB can stagger the implementation to reduce initial investment. The ASEB did not submit any such plan. The Commission in FY 2006-07 order directed the ASEB to set up a Load Research Cell under Discoms to collect data from such consumers and submit to a database on TOD consumption. It could not extend TOD tariff to other categories FY 2006-07 also due to lack of data.

The AERC is also exploring the feasibility of introducing the concept of ToD tariff for other categories of consumers like domestic and commercial. At the same time, they are aware

that such steps will have investment requirements and may lead to burden on consumers, therefore, alternative policy options also need to be studied. Further, separate data for consumption during different periods of day is also not available presently. In the FY 2006-07 order, the Commission has directed the proposed Load Research Cell under each Discom to collect such data.

3. **Promotion of renewables:** In order to encourage consumers to switch over to solar water heating system, the Commission introduced a monthly rebate of Rs.30 for all consumers who have installed solar water heating systems for meeting their hot water requirements and these are actually used. To avail this rebate, the consumer is required to give the licensee an affidavit to the effect that such a system has been installed on his premises and is being used to meet his water heating requirements. In case, any such declaration is found to be false, the licensee apart from taking appropriate legal action against such consumer would be entitled to recover the entire rebate allowed to such consumers with 100% penalty. In FY 2006-07, it increased this rebate from Rs 30 to Rs 40. It also directed the Load Research Cell of the Discoms to collect and submit information regarding use of solar water heating systems in their respective areas and the total amount of rebate allowed.

Category wise average tariff

Table 3.28 shows the average realization from tariffs for FY 2004-05 and FY 2005-06 and the corresponding change during this period. It shows that while average realisation from domestic, commercial and tea & coffee consumers increases; the realisation from industry and oil categories declined.

Table 3.28: Category wise average tariff in FY 2004-05 and FY 2005-06

<i>Category</i>	<i>FY 2004-05 Rs/kWh</i>	<i>FY 2005-06 Rs/kWh</i>	<i>Change %</i>
Domestic	3.04	3.57	17.37%
Commercial	5.36	5.39	0.50%
Industry	4.26	4.19	-1.75%
Tea & Coffee	4.82	5.84	21.25%
Oil	6.50	5.97	-8.12%
Total	3.96	4.38	10.61%
Fin support	0.35		
	4.31	4.38	1.62%

Source: Tariff orders issued for FY 2004-05 and FY 2005-06

Cross Subsidy

The Commission in its orders has recognized the need for elimination of cross subsidy and full cost tariffs. However, it

also recognised that the elimination of cross subsidy cannot be achieved immediately and that it has to be coupled with natural load growth and efficiency improvement measures, without jeopardizing the financial viability of the licensees and causing tariff shocks to consumers. It has also stressed that removal of theft will reduce the cost of serve for all consumers and the need for large tariff increases. The Commission in its order estimated a reduction in amount of cross subsidy from previous level of Rs.80 Crore to Rs.60 Crore during FY 2005-06. The change in cost recovery for some important categories from FY 2004-05 to FY 2005-06 is given in Table 3.29.

Table 3.29: The change in cost recovery for some categories from FY 2004-05 to FY 2005-06

<i>Category</i>	<i>FY 2004-05 AR/AC</i>	<i>FY 2005-06 AR/AC</i>
Domestic	68.93%	70.63%
Commercial	121.47%	106.57%
Industry	96.57%	82.82%
Tea & Coffee	109.17%	115.55%
Oil	147.34%	118.18%

Source: Tariff orders issued by AERC for FY 2004-05 and FY 2005-06

The above table shows that the cost recovery from the categories of oil, commercial and industrial consumers has come down, and that for domestic and tea & coffee has increased. The oil and commercial consumers were paying much above the average cost of supply and the domestic consumers were paying below the costs. The above table thus indicates that an attempt has been made to bring their tariffs closer to the cost of supply. At the same time, increase in recovery from tea & coffee consumers that were already paying a tariff above the average costs is a move towards increase in cross subsidy.

The Commission directed the licensees to conduct a study to estimate the voltage based cost of supply that would indicate the actual cost of supply to particular consumer category. The Commission itself conducted a study to calculate cost to serve on a voltage basis and the details of this were discussed in the order for FY 2006-07. The CoS model of the Commission is based on embedded cost approved by the Commission and is based on information on some sample data of load curves of different categories of consumers and sample cost break up of separation of distribution costs.

The Commission has also applied this cross subsidy data for different categories of consumers based on the estimated cost of supply to different categories of consumers to arrive at the cross subsidy surcharge component of tariff of respective categories of consumers. This cost separation as per the model gives an

indication of cost causation by different categories of consumers depending on the supply voltage, time of use, load factor etc. The cost separation will facilitate open access to those consumers who may opt for open access benefit as per the provisions of the AERC Open Access Regulation.

Convergence Index

Figure 3.10 indicates the trend in CI for Assam from FY 2004-05 to FY 2005-06. Again the figures for FY 2003-04 are not included in the analysis, as the Commission did not rationalise tariff structure for this year. The CI is improved marginally during FY 2004-05 and FY 2005-06. The CI shows a 6% improvement in CI from existing tariffs in FY 2004-05 to approved tariffs in FY 2005-06.

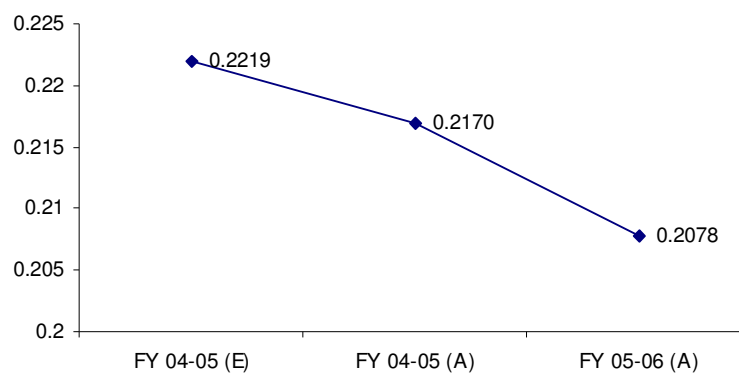


Figure: 3.10 Trend in convergence index

Source: TERI estimation from tariff orders issued by AERC for FY 2004-05 and FY 2005-06

Subsidy Support from Government

The Government of Assam (GoA) has confirmed to AERC their financial support to ASEB amounting to Rs.110 Crore for FY 2003-04, Rs.76 Crore for FY 2004-05 and Rs.49 Crore for FY 2005-06. This is primarily due to cross liability adjustment undertaken by GoA as a part of reform and restructuring process. The Commission took this amount into account and reduced the full cost tariff to that extent.

Revenue Gap

The revenue gap, i.e., the difference between the revenue from existing tariffs and current approved annual revenue requirement, approved by the AERC for FY 2003-04 was Rs.154.17 crore. However, the effective gap after GoA support of Rs 110 crore was only Rs.44.17 crore. Since no tariff order was issued for FY 2003-04, the Commission included this revenue gap in the ARR of FY 2004-05 as past liability. The revenue shortfall for FY 2004-05 was Rs.98.29 crore. After financial support of Rs 76 crore from the GoA, the gap that

needs to be filled through tariff hike was Rs.22.29 crore. For FY 2005-06, the tariff order was issued for unbundled entities. The details available in the order are given in Table 3.30.

Table 3.30: Revenue gap and tariff adjustment from FY 2003-04 to FY 2005-06

Component	FY 2003-04	FY 2004-05	FY 2005-06
ARR (Rs. Crore)	894.41	966.11	961.42
Revenue from existing tariff (Rs. Crore)	740.24	867.83	965.02*
Revenue gap (Rs. Crore)	154.17	98.29	-
Financial support from GoA (Rs. Crore)	110	76.00	49.00
Revenue gap to be recovered from tariffs (Rs. Crore)	44.17	23.27	
Average cost of supply (Rs./KWh)	4.67	4.41	4.36
Average realization (Rs./KWh)	3.88	3.96	4.44
Financial support from GoA (Rs./KWh)	0.58	0.35	-
% Tariff adjustment	0.00%	2.57%	3.66%*

Source: Tariff orders of AERC

* This was reassessed at Rs 952.42 Crore by the Commission in FY 2006-07 order due to changes in contracted demand for Tea, coffee and rubber consumers and with reassessment the average tariff becomes Rs 4.32/kWh

** This increase is over approved ARR for FY 2004-05

The Commission made an attempt in its orders to reduce the revenue gap over the years. However, as per the utilities, they suffer from cash flow problems. The actual revenue collected by the Board in FY 2003-04 was Rs 841.70 Crores, Rs 906 Crore in FY 2004-05 and Rs 959.37 Crore in FY 2005-06; however, expenditure has been much higher than that approved by the AERC. As per the Accounts of the ASEB, the deficit in FY 2003-04 was Rs 655 crore and Rs 1011 Crore in FY 2004-05.

Tariff determination for FY 2005-06

Since the tariff order for FY 2005-06 dealt with the unbundled entities in the states, the Commission implemented a differential BST until such time as GoA uniform retail tariff policy changes or the customer mix or business performance of each Discom means that it is no longer required. The retail tariffs for consumers of electricity will be same in entire state irrespective of cost of supply. The tariff order gave detailed explanation of the methodology of fixation of the Bulk Supply Tariff (BST) and the issues involved in it.

State Electricity Duty (SED)

State electricity duty is charged @ 5 paise per unit. Table 3.31 gives the electricity duty being collected in Assam.

Table 3.31: State Electricity Duty (Rs Crore)

	FY 2003-04	FY 2004-05	FY 2005-06
SED (Rs Crore)	5.32	14.33	14.33
SED per unit of total sales (paise)	2.46	2.43	2.43
SED per unit realised from consumers who pay such duty	2.54	2.55	2.55

Source: Annual Accounts of ASEB

Governance

Public Participation

In FY 2004-05, the Commission received six objections on the ARR submitted for FY 2003-04 and FY 2004-05. During the hearings, eight representations were heard by the Commission. The objectors included mainly the chambers of commerce (North East Chambers of Commerce & Industry, National Chamber of Commerce and Federation of Industries & Commerce of Northeastern region); Tea industry (Indian Tea Association, Tea Association of India, Goodricke Group Limited, Gillanders Arbuthnot and Company Limited¹), The All India Manufacturers' Organization, Assam Tea Planters Association, Bhartiya Cha Parishad and one domestic consumer.

In FY 2005-06, a total of nineteen objections were received and hearings were held at Guwahati and Dibrugarh. The objectors were again mainly industry associations and Tea manufacturers; however there was an improvement in the number of other objections from domestic consumers also. Out of the 19 objections received, 2 were from tea associations; 9 from industry and commercial consumers/associations; 4 from consumer associations and 3 from individual domestic consumers and 1 from an industrial consumer. Table 3.32 gives the break up of consumers who raised objections during the hearings.

Table 3.32: Break up of consumers who raised objections during the hearings

	<i>Domes tic</i>	<i>Industry and commercial</i>	<i>Tea Associations</i>	<i>Total</i>
FY 2003-04, FY 2003-04	1	4	3	8
FY 2005-06	7	10	2	19

Source: Tariff orders issued for FY 2004-05 and FY 2005-06

The Commission had reconstituted the Advisory Committee in November 2004 with 18 members. The first meeting of the reconstituted Advisory Committee was held on 5th April 2005. The tariff petitions submitted by ASEB and successor entities for the FY 2005-06 were also discussed in the meeting. The advice of the members was also taken into consideration while fixing the tariffs for ASEB and successor entities for FY 2005-06.

¹ Indian Tea Association (ITA), Tea Association of India (TAI), Goodricke Group Limited (Goodricke), Gillanders Arbuthnot and Company Limited (Gillanders) submitted a joint objection.

Timeliness of Tariff Orders

As per the regulations of the AERC, the ASEB and all successor entities are required to file tariff petitions to the Commission before 15th December each year for the tariff of following year.

The ASEB submitted its petition for FY 2003-04 on 31st December 2003 after taking an extension of submission date from 15th to 31st December 2003 from the Commission. The Commission asked for resubmission of the petition to incorporate changes stipulated in the tariff order it had issued for FY 2002-03 on 26th March 2003. ASEB then requested for an extension of time which was disallowed by the AERC. The Board then made its resubmission for FY 2003-04 on 1st July 2003.

For FY 2004-05, the ASEB Board requested for extension of time of 60 days from the date of 15th December for submission of petition in view of reform and restructuring taken up by it. The Commission allowed this extension as requested. On request from the Board, the time limit for submission of the petition for FY 2004-05 was further extended till 25th February 2004. Accordingly the Board filed petition 25th February 2004. The Commission also sought additional clarifications and additional information from ASEB in January, to which the ASEB responded in April 2004. The Commission considered this information in the review of the petition for FY 2004-05 and also scrutinised the information submitted for FY 2003-04.

After the initial scrutiny of petitions, objections raised by the public and the replies of the ASEB and successor entities, the Commission issued the tariff order on 21st July 2004, i.e., 144 days after the acceptance of petitions. The Commission gave the reasons for this delay beyond 120 days. It highlighted that part from the delays cause due to clarifications and information gaps in the petitions; the Commission was facing shortage of staff. This is discussed later in this section.

On 10th December 2004 the Government of Assam issued a notification to restructure the Assam State Electricity Board. On 10th December 2004, the ASEB filed a petition before the Commission that in view of the re-organisation of ASEB it would be meaningful if the different newly formed entities submit their own tariff petitions before the Commission, praying for 60 days time from 10th December to submit the petitions. On 14th December, the Commission granted 40 days time to the entities to submit petitions.

ASEB and each of the successor entities initially filed petitions on 19th January 2005 and requested for additional 20 days time for submission of PPA of APGCL with Distribution Companies,

Transmission Service Agreements (TSAs) between APGCL, AEGCL and Discoms and Bulk Supply Agreements between ASEB and Discoms. After scrutiny of the petitions, the Commission found that the petitions were not found acceptable due to a number of reasons. The AERC has enumerated the reasons in its order also.

The Commission directed that these petitions be submitted afresh within fifteen days, i.e. 7th February 2005. On 27th January 2005 and 1st February 2005 the Commission directed the petitioners to submit additional information along with the petitions. On 29th January, 2005 the Petitioners submitted the draft PPA, Transmission Service Agreement and Bulk Supply Agreements. The petitions of the distribution companies were accepted on 15th February after all entities submitted the requisite information.

The tariff order for FY 2005-06 was issued on 27th May 2005, i.e. within 102 days of date of acceptance of the petitions.

Consumer Advocacy and Redressal mechanism

In February 2005, the AERC established a Consumer Advocacy Cell (CAC) for assisting and empowering consumers to effectively take part in different regulatory functions of the Commission. The main objective of this is to involve consumers in the power sector reform process in the state through active participation in the public hearings and other- discussions organized by the Commission. CAC endeavours to protect the interests of consumers and make their voice heard in the processes relating to activities of the Commission. The team of the CAC comprises of the following:

1. The Chairperson, AERC as Chief Mentor
2. The Secretary, AERC as Adviser Joint Director (Tariff) as Supervisor Consultant (Consumer Advocacy) as In-Charge
3. Consultant (Data Collection) as Coordinator
4. Other Officers and Staff of AERC as Team Members
5. Consumer Groups as Team Members

The Commission has also provided for empanelment of consumer groups with the Cell and twelve consumer groups have already empanelled themselves with CAC as on 15th August 2006.

The CAC publishes a quarterly information bulletin “Electricity Consumer Grid”, which is available on the website of the AERC for download.

The Commission has issued the AERC (distribution licensee’s standards of performance) regulations; Guidelines for Redressal

of consumer grievances and the AERC (Electricity Ombudsman) regulations. These regulations also contain penalty provisions if the licensees do not adhere to the provisions. However, the distribution licenses has requested for an extension of time of 6 months before these become applicable to them also and the same has been granted by the AERC. The Electricity Ombudsman has not yet started functioning due to delays from the Government.

The licensees in the petition for FY 2005-06 submitted that they have already started reviewing and redesigning their processes (facilities like drop boxes for payment through cheques has been initiated in some areas). Some of the key processes under review at that time include handling applications for new connections, handling customer grievances and improvements to the current payment receiving facilities. The licensees also plan to improve the infrastructure capabilities to capture the data requirements of AERC and regularly monitor complaints.

Anti-theft measures

Anti theft teams have been set up in each sub division with all the feeder managers headed by the S.D.E. In addition to that three persons of the rank of S.E have been deputed in each DISCOM as SE (Technical Inspection) to detect unauthorised connections and theft. Further, Chief Vigilance Officer with his Security personnel has formed a special team at the Headquarters level to conduct anti theft drives. However, at present, no special courts have been set up to deal with the issue of theft.

The Commission in the FY 2006-07 order also noted that though it had fixed T&D loss target for different years in earlier tariff, the DISCOMs could not achieve the targets in the previous years. It further mentioned that the losses in the UAEDCL are higher than that of other two DISCOMs even though there are large numbers of HT consumers like the tea gardens under UAEDCL. It directed that all the DISCOMs including UAEDCL should make all out efforts to reduce T&D losses so as to achieve the targets fixed and should take stern administrative and legal actions against theft of power.

Open Access

The Commission issued the Open Access Regulations in 2005. It notified the charges applicable for open access consumers who are likely to avail the open access facilities including captive generators in the order for FY 2006-07. It notified the cross subsidy charges calculated considering the cost of supply model and the additional surcharge to be payable wherever applicable, in a case-to-case basis.

Table 3.33: Cross subsidy surcharge as estimated in tariff order for FY 2006-07 by AERC

Category	Amount of cross	Cross subsidy surcharge
	subsidy	
	Rs crore	Rs/kWh
LT General Supply	9.36	1.53
Public Water Works	6.94	1.69
Bulk Govt Educational Institutions	1.52	0.63
Other Bulk Supply	11.63	0.47
HT Industries-I	1.72	0.42
HT Industries-II	11.63	0.40
Tea, coffee and rubber	45.10	1.50
Oil & coal	4.81	0.81
HT irrigation	0.23	0.12

Source: Tariff Order for FY 2006-07

The Commission has not provided the detailed methodology and the calculation for estimating the above cross subsidy surcharge. It is therefore, not clear whether they have followed the approach given in the tariff policy or some other method as the open access regulations of the AERC also do not provide the formula.

Appeals against orders

At present, no case of AERC is pending with the Appellate Tribunal for Electricity.

One appeal was made by the Indian Tea Association, Tata Tea Limited and Bahani Team Limited against its order for FY 2004-05. This was in the context of the truing up exercise not undertaken by the Commission close to the end of the period in question for which tariff was fixed. The Tribunal disposed off the appeal by giving the direction to the Commission to undertake the truing up exercise within three months and to give an opportunity of hearing to the affected parties before arriving at the determination in the truing up exercise. The truing up exercise is being undertaken by the AERC currently.

The FY 2005-06 order was appealed by the Indian Tea Association & others on matters related to demand charges computation, Availability based fixed charges, cross subsidy and tariff design procedure. The Tribunal remitted the matter to the Commission for a fresh decision and for the following exercises to be undertaken by the AERC:

1. AERC to lay down principles and procedure for the future in stipulating the fixed cost and to determine fixed charges of the supplier which is to be recovered from the various class of consumers.

2. To evolve a methodology for determine the target Availability
3. AERC to clearly define availability considering he quality of supply
4. Disparities in Availability based fixed charges as provided in the order for FY 2005-06 and those computed based on Electricity Supply Code and related Matters-Regulations to be reconciled and benefits to be extended to the cases which qualify as per the provisions of the Regulations.

Studies undertaken

Some of the major studies that are being undertaken in the state are:

1. Study on long term electricity demand forecast for state of Assam
2. Study on T&D loss assessment in the state of Assam

The above mentioned studies are expected to get over soon and the final reports will be submitted by the consultants undertaking them. These studies are expected to contribute to the planning of the requirements of the power sector of Assam.

Staffing

Apart from the Chairperson, two Members and Secretary, the Commission has the following staff at its office: One Joint Director (tariff), One Deputy Director (Engineering)¹, two consultants (Database & Consumer Advocacy, and data collection), One Advisor (law) and one Advisor (Finance). The Advisor (Finance) has been appointed by the State Government and all expenditure and bills of the AERC are sanctioned only after approval by the Financial Advisor. The Commission wanted a Deputy Director (Finance) but this was not sanctioned. Moreover, the AERC is not allowed to take professionals except as consultants or on deputation from other government organisations. It is thus clear that the Commission facing inadequacy of staff and this constraints its effective functioning, specially, in view of the restructuring of ASEB.

Directives Issued by AERC and their Compliance

The AERC has been issuing directives and suggestions through its Tariff Orders and otherwise also to achieve the above objectives. The status of compliance with the directives issued in tariff order for FY 2005-6 by the licensees are summarized below.

¹ The sanctioned post for a Deputy Director (Finance) is presently vacant

Table 3.34: Status of compliance on directives issued by AERC

Directive	Action taken Report	Comments by AERC
<p>T & D Losses – Guwahati-II, Jorhat and Dibrugarh T & D Losses The Commission directed the Discoms to undertake a study of the reduction of losses gained from investments in these circles since APDRP programmes had started here and submit the same at least one month before the submission of next tariff petition.</p>	<p>For Guwahati Circle II, feeder-wise energy meters and substation meters are being installed and in some points the same have already been commissioned under the APDRP scheme.</p> <p>Actual T&D loss reduction can be assessed after 100% completion of the above works. The details regarding the APDRP Schemes provided in the FY 2006-07 petition.</p>	<p>1. No target has been given for completion of feeder wise metering and substation metering under APDRP which may be intimated within three months from issue of FY 2006-07 order.</p> <p>2. Reduction of losses in the three circles, namely Guwahati-II, Jorhat and Dibrugarh consequent to APDRP works may be assessed and intimated to the Commission within three months from issue of the Tariff order.</p>
<p>Billing Efficiency The Commission directed the Discoms that Annual Average of monthly Billing Efficiency should not be less than 95%.The Discoms were also directed to furnish a quarterly report on the Billing Efficiency achieved with effect from July 2005 indicating the action taken in respect of the units where the Billing Efficiency was lower for informing the consumers the names of the units and of the officers in their charge.</p>	<p>ASEB submitted the billing efficiency for the period April-July 2005. It submitted that it has outsourced the billing activities with a view to achieving higher and improved billing percentages. Computerization of billing is underway and Billing efficiency is expected to stabilize after full computerization is done.</p> <p>Spot billing has been introduced for domestic, commercial and small and medium industrial consumers on a trial basis. It also submitted the status report on the use of Spot Billing Machines</p>	<p>The quarterly report on the Billing Efficiency achieved with effect from July 2005 indicating the action taken in respect of the units where the Billing Efficiency is lower not submitted. The quarterly reports are to be submitted with effect from July, 2006.</p>
<p>Collection Efficiency The Commission directed the Discoms that Annual Average of monthly Collection Efficiency should not be less than 95%. The Discoms were also directed to furnish a quarterly report on the Collection Efficiency achieved with effect from July 2005 indicating action taken in respect of units here the Collection Efficiency is lower for informing the consumers the names of the units and of the officers in their charge.</p>	<p>ASEB submitted that Collection efficiency for July 05 was 95% and also listed the actions undertaken by it like regular disconnection drive against non-payment of dues, disconnection prioritisation notices are being issued to the defaulting consumers, introduction of spot billing for domestic, commercial and small and medium industrial consumers and introduction of Automated Meter Reading</p>	<p>The quarterly report on the Collection Efficiency achieved with effect from July 2005 indicating action taken in respect of units where the Collection Efficiency is lower is not submitted. The quarterly reports are to be submitted with effect from July, 2006.</p>
<p>Security Deposit Register The Commission directed each Company to maintain an up to date Security Deposits Register duly reconciled with their books of accounts. The licensees were directed to evolve a suitable mechanism to refund the interests accrued on security deposit collected from the consumers and submit a report on the same before the Commission within one month of this order.</p>	<p>Security Deposit Registers at the Subdivision-level have been introduced and are being updated regularly. For payment of interest on security deposit a guideline for the same has been circulated to the offices. An updated status report on this matter will be furnished shortly to the Commission.</p>	<p>A status report on the refund of interests on security deposits for the year 2005-06 not submitted before the Commission. The status report for 2005-06 is to be submitted within 3 months from issue of FY 2006-07 order.</p>
<p>Detailed Business Plans for Next 5 Years The Commission required each of</p>	<p>The work on Business Plans for the next 5 years is underway and it is expected that the same will be completed after the tariff filing</p>	<p>The Business plans for each of the Discoms are to be submitted by 30.09.2006.</p>

Directive	Action taken Report	Comments by AERC
the Licensees to submit detailed business plans for the next 5 years having details of its Capital expenditure and Financing plans as well the future projections of operational performance like losses and collection efficiency.	process for FY 2006-07 is over.	
Energy Auditing & Distribution Losses The Discoms were required to take up pilot projects to study the exact nature and causes of losses.	Action is taken to conduct a study on energy auditing and distribution losses. Report on studies being conducted to be submitted to the Commission in due course.	Report of pilot projects on Energy Auditing and Distribution losses are to be submitted by 30.09.2006.
Divisional/Sub divisional Accountability for Profit, Losses and Revenue Introduce accountability and responsibility within the divisions and subdivisions and hence look at each of these as profit centers and monitor losses and revenue performance of these centers.	The performance of the individual Divisions and Subdivisions is being closely monitored and necessary action is being taken to proceed in line with the directive. The process has been initiated to introduce accountability and responsibility at the Division and Sub Division level. MOUs with CEO's, CEO's & EE's of respective Divisions under them, & between respective EE's and SDEs have been signed and responsibility and accountability as profit centre is being fixed. The company has introduced a Performance Incentive Scheme as well, on a trial basis. The details of this scheme have been furnished in the petition.	It was directed by the Chairperson in the meeting to review the implementation of Directives of the Tariff order held on 06.09.05 that MOUs between Chairman/MD and CEO's, CEO's & EE's of respective Divisions under them, between EE's and AEE's and between AEE's and JEs will be submitted to the Commission by October 2005 and the monitoring of performance indicators of the MOUs was to be also reported to the Commission. The profit and loss accounts submitted by CEOs are also to be shared with the Commission. The above are not yet submitted to the Commission and are to be submitted within three months from issue of FY 2006-07order.
Distribution Losses The three Discoms are to submit data regarding the current and future level of Distribution losses for FY 2006-07 including the impact of Distribution network projects on the reduction of losses no later than three months from the issue of the order.	After completion of various project works under LAEDCL, distribution losses are expected to reduce by a considerable extent. The details of the various initiatives for reduction of distribution losses have been furnished in the petition under the head "Efficiency Improvement Initiatives". Following the Directives of the Commission and the ongoing Distribution System strengthening program, the distribution loss for LAEDCL has been estimated as 24.9% for FY 2006-07.	Projections on future level of Distribution losses upto next 3 years are to be submitted along with next Tariff Petition.
Billing & Management Information Systems The Discoms to submit a status report of the its Billing and MIS being followed by each of the Discoms.	MIS can be generated only after a full fledged completion and implementation of computerized billing system. Efforts are on to implement computerized billing in most of the IRCA divisions – which deal mainly with high value consumers. However, computerized billing is also being introduced in some of the Electrical sub divisions for	The status report of the Computerized Billing and MIS being followed by each of the Discoms is to be submitted within three months from issue of order.

Directive	Action taken Report	Comments by AERC
	domestic and commercial consumers. Total computerization will be implemented after the completion of the CMC Billing project	
Interface Metering Points The five petitioners are to provide details of interface metering points of the five petitioners for energy accounting, and also the status of accounting as directed by the Commission in the Interim Tariff Order dated 31 March, 2005.	Interface metering between the Discoms and AEGCL is being done. A detailed report on the installation of ABT compliant meters that are being installed has been furnished in the petition of Assam Electricity Grid Corporation Limited	As per the letter sent by M.D, AEGCL, the installation and commissioning of the Meters and accessories is expected to be completed by the first week of December, 2006. The Commission will not allow further extension of date of installation and commissioning of the Meters

Source: Tariff orders issued for FY 2004-05 and FY 2005-06

Power sector rating

As per the performance rating of the state power sector carried out at the instance of the Ministry of Power, GoI, Assam has been given the following ratings during FY 2003-04, FY 2004-05 and FY 2005-06

Table 3.35: Power sector rating

	FY 2003-04	FY 2004-05	FY 2005-06
Rank	16	17	11
Score	27.43	27.32	28.46

Assam moved up six notches from 17th to 11th in FY 2005-06. The ranking report highlighted the following as the reasons for this:

1. Substantive reforms and restructuring measures for the state power sector- ASEB has been unbundled on functional lines and the successor entities have been operational during FY 06.
2. Substantial financial assistance from Asian Development Bank (ADB) for financial and T&D reform measures.
3. Assumption of several outstanding liabilities of ASEB by GoA in FY 2004-05 and FY 2005-06 will improve ASEB's liquidity position.
4. Operating losses, on accrual basis, have by and large shown a downward trend since FY 2001-02 while cost coverage on both accrual and cash basis have shown an improvement in 2004-05.

Regulation issued

Draft Regulations

1. Notification for First Amendment of AERC (Electricity Supply Code and Related Matters) Regulations, 2004
2. First Amendment of AERC (Electricity Supply Code and Related Matters) Regulations, 2004

3. First Amendment of Assam Electricity Regulatory Commission (Terms and Conditions for Open Access) Regulations, 2005

Regulations notified under AERC Act 1998

Regulations notified under Electricity Act, 2003

1. AERC (Appointment of Consultant) Regulations, 2002
2. AERC (Terms and Conditions for Determination of Tariff) Regulations, 2006
3. AERC (Terms and Conditions for Open Access) Regulations 2005
4. AERC (Procedure, Terms and Conditions for granting a Distribution Licence and other related matters) Regulations, 2005
5. AERC (Procedure, Terms and Conditions for granting an Intra-State Trading Licence and other related matters) Regulations, 2005
6. AERC (Procedure, Terms and Conditions for granting an Intra-State Transmission Licence and other related matters) Regulations, 2005
7. AERC (Distribution Licensees' Standards of Performance) Regulations, 2004
8. AERC (Constitution of State Advisory Committee and its function) Regulations, 2004
9. AERC (Assam Electricity Grid Code) Regulations, 2004
10. AERC (Distribution Code) Regulations, 2004
11. AERC (Conduct of Business) Regulations, 2004
12. Guidelines for Redressal of Consumer Grievances
13. AERC (Electricity Ombudsman) Regulations
14. AERC (Metering Code for Assam Grid) Regulations, 2004
15. AERC (Transmission Licensees' Standards of Performance) Regulations, 2004
16. AERC (Electricity Supply Code and Related Matters) Regulations, 2004
17. AERC (Distribution Metering Code) Regulations, 2004

Conclusion

- Reforms were initiated in Assam in 2001 with the establishment of the Assam Electricity Regulatory Commission.
- Some progress has been made on issues like undertaking studies on loss estimation and demand forecasting.
- A consumer advocacy cell has also been established in the Commission.
- Measures like time of day tariff and special concession for using renewable energy are part of the retail tariff structure and concepts like multi year tariff are expected to be implemented soon.

- Much of the progress has also been due to US\$ 100 million Assam Power Sector Development Program funded by ADB.
- No significant improvement has been made in loss reduction. The actual losses were 39.07% in FY 2003-03 and in FY 2004-05 they have increased to 39.90%. In FY 2005-06, it has reduced further to 35.67%, however, audited figures for the same are yet to come. The utilities have not achieved the reduction targets as set by the Commission in its various orders
- Billing efficiency remains very low (65-70%) for the three distribution licensees which has significant impact on the revenues and AT&C loss level.
- The status of metering at distribution transformer level is dismal with only 7% of them metered
- Anti theft measures need to be strengthened
- A major constraint faced by the regulator in Assam is the lack of adequate staff and there is a need for GoA to provide for realistic terms of employment of regulatory staff. However, much still needs to be done on AT&C losses and the revenue- expenditure gap.

CHAPTER 4 Delhi (BRPL, BYPL and NDPL)

Introduction

The Delhi Electricity Regulatory Commission (hereinafter referred to as 'Commission or DERC') was constituted by the Government of National Capital Territory of Delhi on 3rd March 1999 under the Electricity Regulatory Commissions (ERC) Act of 1998 and became operational with effect from 10th December 1999. The Commission gave its first order on rationalization of tariff for Delhi Vidyut Board (DVB) on 16th January 2001. Till date the commission has issued 16 tariff orders for 3 distribution companies and Transco for FY 2002-03 (9 months) and FY 2003-04 (joint order), FY 2004-05, FY 2005-06 and FY 2006-07.

Pursuant to the provisions of the Act, the Government of National Capital Territory of Delhi (GoNCTD) notified the Delhi Electricity Reform (Transfer Schemes) Rules, 2001 on November 20th, 2001 that provided for unbundling of the functions of DVB into a Transco, a Genco, and three Distribution Companies (Discoms). The generating company is called GENCO and the transmission company is the Delhi Transco Limited (DTL) or Transco.

The Government, through the Policy Directions indicated its intent to disinvest majority shareholding in the Discoms to private investors with the balance 49% remaining with the Government. In July 2002, the distribution business was handed over to private parties. Out of the three distribution companies created pursuant to the restructuring schemes, two companies, namely BSES Rajdhani Power Ltd. (BRPL), BSES Yamuna Power Ltd. (BYPL) were taken over by the Reliance Group whereas the third company North Delhi Power Ltd. (NDPL) was taken over by Tata Group.

Demand Supply Gap

The power supply position in Delhi has improved with peak shortages in FY 2003-04, FY 2004-05 and FY 2005-06 (i.e. 3.0%, 1.9% and 3.3% respectively) showing a declining trend. The energy shortages however have marginally increased from 1.4% in FY 2003-04 to 1.6% in FY 2005-06.

Movement in Installed capacity

While demand is increasing, capacity additions have remained relatively stagnant (Figure 4.1). Nearly 1000 MW of installed capacity comprising of Pragati (330 MW), Rajghat (135 MW), Indraprastha (247.5 MW) and Gas Turbine (282 MW) generates

only 400-500 MW. Badarpur Thermal Power Plant (Haryana) is dedicated for Delhi's use and contributes another 630 MW. This together makes the Delhi's own supply to around 1100 MW.

Delhi produces just 25-30% of its total demand and depends on the Northern Grid for the rest. Nearly 70-75% of Delhi's power needs are thus met by purchases and sharing of power from outside. Sometimes, in order to rescue Delhi during the power crisis, a portion of the unallocated capacity in the northern region is also given to Delhi depending upon its availability in the grid. In addition, DTL also arranges supply during emergency needs or summer months from states/utilities having surplus capacity and willing to sell their power to Delhi.

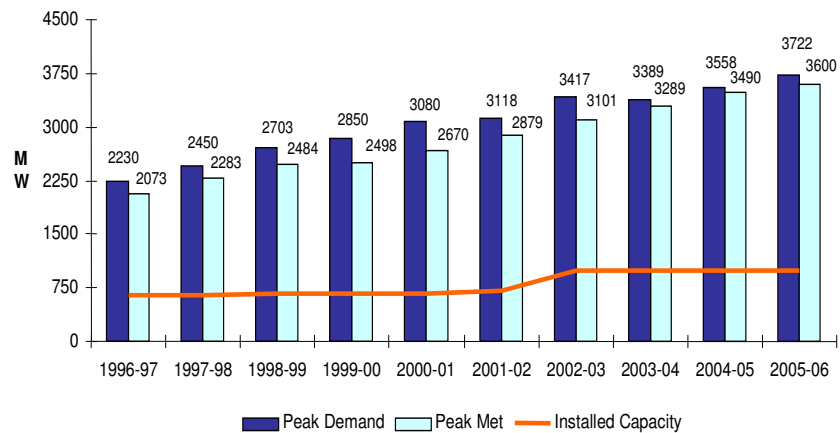


Figure 4.1 Delhi's demand-supply gap and own generation capacity

SOURCE (a) Annual Report Annual Report on the working of State Electricity Boards and Electricity Departments, May 2002, Planning Commission, GoI; (b) Economic Survey of Delhi 2003-04; (c) Website of Delhi Transco Limited

In spite of this, Delhi has been experiencing peak shortages over the last many years (Figure 4.2), and these get amplified during the summer months. The year-wise energy deficit recorded an increasing trend from FY 1997-98 to FY 2005-06 (Figure 4.2)

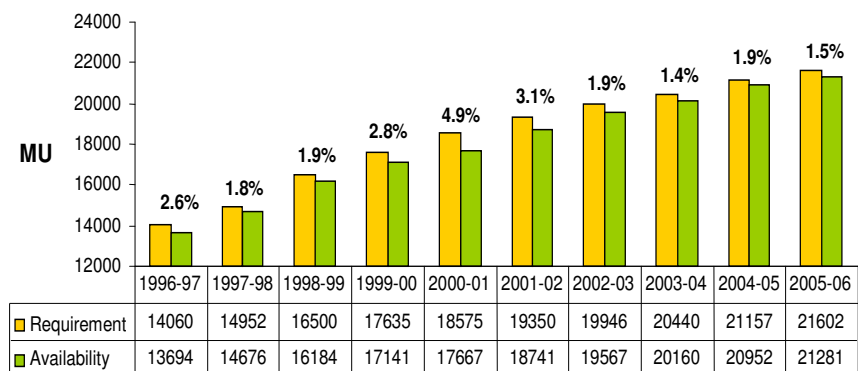


Figure 4.2 Delhi's energy deficit

SOURCE Website of Central Electricity Authority

Load shedding

Table 4.1 highlights the load shedding in Delhi over the last two year.

Table 4.1 Load Shedding in Delhi (MU)

Year	Transco						Total
	Under frequency	Break-downs & Constraints	Grid Restrictions	NDPL	BSES	IPGCL & PPCL	
FY 2003-04	13.0	23.4	3.4	53.9	135.6	0	229.3
FY 2004-05	12.9	16.3	1.5	35.9	109.2	0.66	176.5

SOURCE TERI workshop on Delhi Power Reforms: Way Ahead held in August 2005

As is clear from Table 4.1 there has been a decrease in the load shedding over the last two years.

Consumption and access

Approach for sales/demand estimation

In order to estimate the sales for each year, the Commission has forecast the category-wise demand for consumers of all the DISCOMs considering the short-term and the long-term trend in the sales and actual sales during the previous year. The Commission has also considered the projections submitted by each DISCOM. The total sales arrived by the Commission has then been allocated to each DISCOM in proportion of its share in the total actual sales in the previous year.

Category-wise sales

Domestic consumers dominate the consumer mix with more than 50% share in the total sales followed by non-domestic and industrial category for both FY 2003-04 and FY 2005-06. Further, the non-domestic category has witnessed the highest

increase in demand over the two-year period. Figure 4.3 highlights the consumer-mix in Delhi for FY 2003-04 and FY 2005-06.

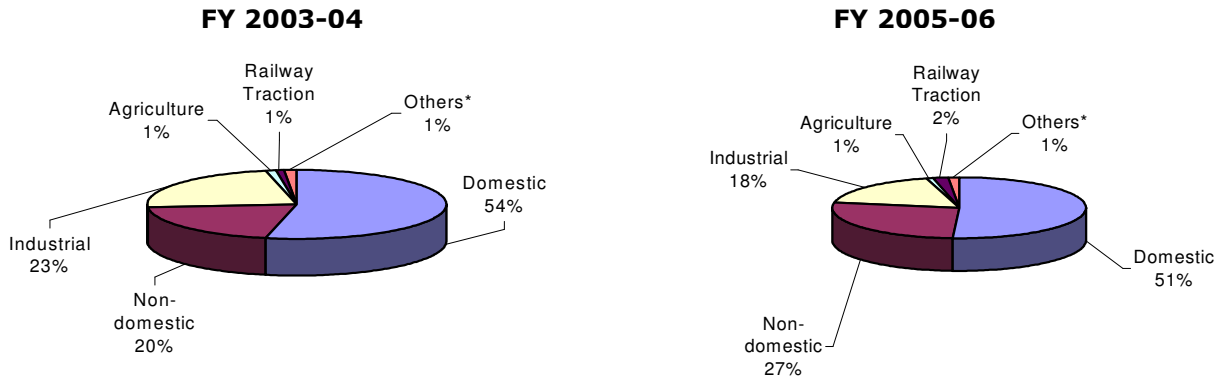


Figure 4.3 Share of consumer categories in the total sales (FY 2003-04 and FY 2005-06)

SOURCE Tariff orders issued by DERC for various years

An analysis of trend in sales indicates that the sales grew at a considerably higher rate (14.15%) in FY 2005-06 over the previous year than in FY 2003-04 over the previous year (3.32%). The main reason for the same is the steep rise in the consumption by non-domestic and industrial consumers in FY 2005-06. Over the two-year period, the highest percentage increase is witnessed in case of non-domestic category (58.10%) followed by the domestic category (12.37%). The overall percentage increase in sales increase over the two-year period is 17.94%. Table 4.2 highlights the movement in category-wise and overall sales for FY 2003-04, FY 2004-05 and FY 2005-06 for each utility and aggregate for Delhi.

Table 4.2 Trends in the sales to various consumer categories (Approved)

(MU)

S. No.	Consumer category	FY 2003-04				FY 2004-05				FY 2005-06			
		BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total
1	Domestic	2642	1567	1452	5661	2836	1682	1640	6158	3131	1593	1637	6361
2	Non-domestic	895	639	614	2148	1158	647	716	2521	1726	936	732	3394
3	Industrial	1057	536	884	2477	662	306	747	1715	632	390	1247	2269
4	Agriculture	79	1	25	105	73	1	31	105	66	0	25	91
5	Railway Traction (including DMRC)	38	0	52	90	34	89	66	189	110	0	123	233
6	Others*	72	37	38	147	173	0	120	293	71	35	81	187
	Total	4783	2780	3065	10628	4936	2725	3320	10981	5736	2954	3845	12535

* Includes temporary supply, public and street lighting

SOURCE Tariff orders issued by DERC for various years

A further comparison of the proposed, approved and actual sales for FY 2003-04, FY 2004-05, and FY 2005-06 is given in Table 4.3

Table 4.3 Category-wise sales over the years (Proposed, approved and actual) (MU)

Consumer category	2003-04			2004-05			2005-06		
	Petition	Order	Actual	Petition	Order	Actual	Petition	Order	Actual
Domestic	5267	5661	5648	6132	6158	5995	7040	6361	5820
Non-domestic	2034	2148	2312	2988	2521	3186	3183	3394	3422
Industrial	2157	2477	1681	1804	1715	2161	1831	2269	2442
Agriculture	78	105	99	75.85	105	86	76	91	57
Railway Traction (including DMRC)	87	90	93	123	189	167	224	233	200
Others*	347	147	380	252	293	264	280	187	468
Total	9970	10628	10213	11375	10981	11859	12633	12535	12409

*Includes public / street lighting, temporary supply

SOURCE Tariff orders issued by DERC for various years

As seen from the above, there have not been any major variations in the sales approved by the Commission and the actual sales in that year.

Number of consumers and sanctioned load

The numbers of registered consumer in Delhi have increased from 24 lakh in FY 2003-04 to 27 lakh in FY 2005-06. The highest percentage increase has been in case of non-domestic category i.e. 65%, and in absolute terms also non-domestic consumer have dominated the increase with 2 lakh consumers added over the two-year period. Domestic consumers dominate the entire consumer mix in terms of numbers with approximately 80% of consumer in this category.

Table 4.4 Number of consumers over the years (in thousand consumers) *All figures in thousand*

Description	FY 2003-04				FY 2004-05				FY 2005-06			
	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total
Domestic	884.1	646.1	523.1	2053.4	851.5	647.5	569.6	2068.7	842.3	611.6	674.8	2128.8
Non domestic	70.6	144.0	95.2	309.8	141.3	179.4	115.5	436.2	159.3	213.0	138.7	511.1
Industrial	19.3	15.9	17.7	52.9	16.1	24.5	26.6	67.2	16.7	22.9	45.8	85.4
Agriculture	13.6	0.2	5.5	19.3	8.9	0.2	5.4	14.5	5.7	0.1	4.3	10.1
Railways (incl. DMRC ¹)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Others	0.9	24.4	0.0	25.3	1.2	0.4	6.9	8.4	5.8	7.1	0.1	12.9
Total	988.5	830.7	641.5	2460.7	1019.0	852.0	724.0	2595.0	1029.8	854.7	863.7	2748.2

SOURCE Data collected from Delhi Electricity Regulatory Commission

The sanctioned load has increased by 40% over the two-year period with 2503 MW added over this period. The percentage increase has been in case of non-domestic (171%) category

¹ The number of consumer in Railways and DMRC is 1 Nos. This is because railways acts as a bulk consumer for the discoms

followed by industrial (90%) and domestic category (25%). In absolute terms highest addition has been in the non-domestic consumer category i.e. 1438MW followed by 924 MW in domestic category.

Table 4.5 Sanctioned load of consumers over the years (MW)

Consumer category	FY 2003-04				FY 2004-05				FY 2005-06			
	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total
Domestic	1881	925	896	3702	1783	794	1071	3648	2235	1057	1334	4626
Non domestic	262	251	329	842	507	306	256	1069	1024	614	642	2280
Industrial	135	141	544	820	322	231	671	1224	376	279	903	1558
Agriculture*	61	2	23	85	29	1	22	52	21	1	19	41
Railways (incl. DMRC)	18	0	26	45	17	0	0	17	17	12	20	49
Others	575	45		620	612	191	14	817	19	28	16	63
Total	2932	1364	1818	6114	3270	1523	2034	6826	3692	1991	2934	8617

SOURCE Data collected from Delhi Electricity Regulatory Commission

Observations

Table 4.6 indicates the sales and revenue contribution of various consumer categories in FY 2005-06.

Table 4.6 Sales and revenue contribution of various consumer categories

Category	No. of consumers	% of total consumers	Consumption*	% of total consumption	Revenue*	% of total revenue
	Nos. (in '000)	%	MU	%	Rs. Crore	%
Domestic	2129	77.5%	6361	50.7%	1986	36.3%
Non domestic	511	18.6%	3394	27.1%	2078	37.9%
Industrial	85	3.1%	2269	18.1%	1221	22.3%
Agriculture	10	0.4%	91	0.7%	14	0.3%
Railways (incl. DMRC)	0	0.0%	233	1.9%	73	1.3%
Others	13	0.5%	187	1.5%	103	1.9%
Total	2748	100.0%	12535	100.0%	5476	100.0%

*Based on approved figures

As seen from the above, while domestic consumers constitute 77.5% of the total consumer base accounting for 50% of the total sales, their contribution to total revenue is only 25%. On the other hand, industrial consumer constitute only 3% towards the consumer base, account for 18% of total sales and 22% towards total revenue. This is further elaborated in Figure 4.4, Figure 4.5 and Figure 4.6.

208 Analysis and compilation of tariff orders

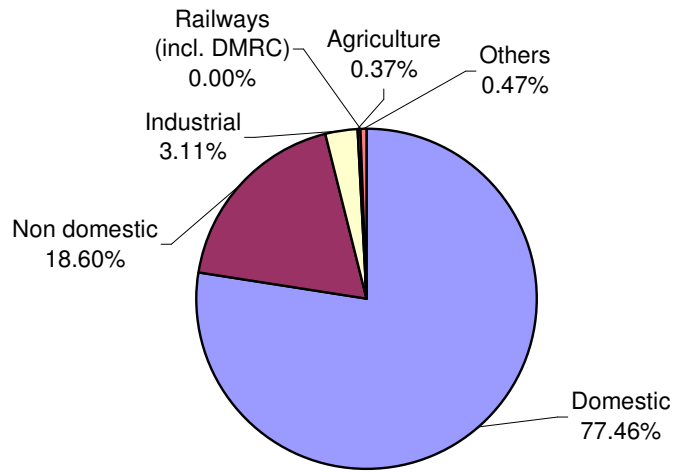


Figure 4.4 category-wise numbers of consumers in FY 2005-06
SOURCE Data collected from Delhi Electricity Regulatory Commission

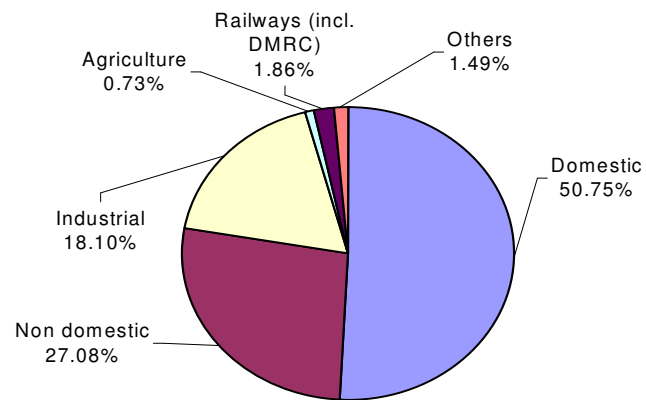


Figure 4.5 Category-wise consumption pattern in FY 2005-06 (approved)
SOURCE Tariff orders issued by DERC for various years

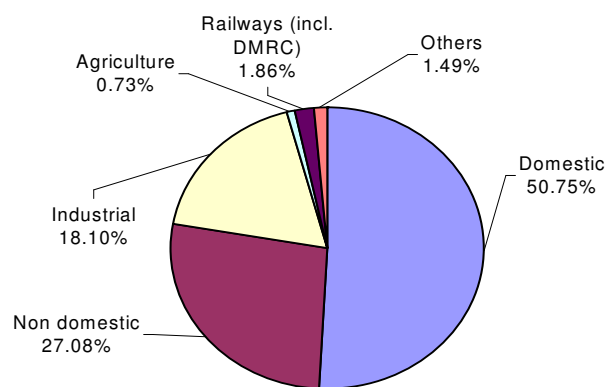


Figure 4.6 Percentage revenue from various consumer categories in FY 2005-06 (approved figures)

SOURCE Tariff orders issued by DERC for various years

Table 4.7 shows the change in consumption per consumer over the years. As seen the overall consumption per consumer has increased over the last two years by 5.6%. This is also accompanied by increase in sanctioned load of these consumers. For domestic category, consumption per consumer has increased by 8.4% over the two-year period.

Table 4.7 Trends in consumption per consumer over the years (approved figures)

Description	FY 2003-04		FY 2004-05		FY 2005-06		Consumption per consumer		
	No of consumers	Consumption	Consumption on per consumer	No of consumers	Consumption	Consumption	No of consumers	Consumption per consumer	
	Nos.(in '000)	MU	Units/consumer	Nos. (in '000)	MU	Units/consumer	Nos.(in '000)	MU	
Domestic	2053	5661	2757	2069	6158	2977	2129	6361	2988
Non domestic	310	2148	6933	436	2521	5780	511	3394	6641
Industrial	53	2477	46845	67	1715	25511	85	2269	26580
Agriculture	19	105	5432	14	105	7254	10	91	9021
Railways (incl. DMRC)	0	90	30000000	0	189	63000000	0	233	58250000
Others	25	147	5817	8	293	34781	13	187	14478
Total	2461	10628	4319	2595	10981	4232	2748	12535	4561

SOURCE Tariff orders issued by DERC for various years and Data obtained from DERC

Table 4.8 shows the change in sanctioned load per consumer over the last three years. As seen, the sanctioned load per consumer has increased in domestic, non-domestic and industrial category and has marginally decreased in agriculture category. While the overall load per consumers is still on the lower side nevertheless it highlights the efforts made by the discoms to estimate the load of consumers more accurately and curb under reporting. This is also a positive sign towards

accurate reporting of load by the consumers and regularizing of illegal consumption and hence reduction of theft.

Table 4.8 Change in sanctioned load per consumer over the years

Description	FY 2003-04			FY 2004-05			FY 2005-06		
	No of consumers	Sanctioned load	Sanctioned load per consumer	No of consumers	Sanctioned load	Sanctioned load per consumer	No of consumers	Sanctioned load	Sanctioned load per consumer
	Nos. (in '000)	MW	KW	Nos. (in '000)	MW	kW	Nos. (in '000)	MW	kW
Domestic	2053	3702	1.80	2069	3648	1.76	2129	4626	2.17
Non domestic	310	842	2.72	436	1069	2.45	511	2280	4.46
Industrial	53	820	15.51	67	1224	18.20	85	1558	18.25
Agriculture	19	85	4.41	14	52	3.58	10	41	4.06
Railways (incl. DMRC)	0	45	14926.67	0	17	5666.67	0	49	12250.00
Others	25	620	24.52	8	817	96.94	13	63	4.88
Total	2461	6114	2.48	2595	6826	2.63	2748	8617	3.14

SOURCE Tariff orders issued by DERC for various years and Data obtained from DERC

Status of electrification

Table 4.9 highlights the status of household electrification in the state. 14.5% of households are yet to be electrified.

Table 4.9 Status of household electrification

Total number of rural households	Households having electricity	% Electrified households	Unelectrified households	% Unelectrified households
169528	144948	85.5	24580	14.5

SOURCE www.powermin.nic.in accessed during May-July 2006

Status of APDRP Schemes

Table 4.10 indicates the status of APDRP schemes in Delhi.

Table 4.10 Status of APDRP Schemes

Project outlay	No. Of projects	Revised APDRP component (Rs. Crore)			Releases up to March 2006 (Rs. Crore)	Utilisation	
		Grant	Loan	Total		Up to March 06	%
922.61	6	230.65	52.76	283.41	105.51	863.23	93.56

SOURCE http://www.apdrp.com/apdrp/projects/about_apdrp.htm, accessed during November 2006

Status of PFC lending

Table 4.11 indicates the status of PFC lending in the state of Delhi.

Table 4.11 Status of PFC lending in Delhi

Description	Total sanctions	Total disbursement
	Rs. Crore	Rs. Crore
DERC	0.14	0.12
Delhi Vidyut Board	1.59	0.76
New Delhi Municipal Council	0.04	-
North Delhi Power Limited	80.27	40.00
Pragati Power Corporation	700	670.53

SOURCE Power Line, Volume 11, No. 2, October 2006

Efficiency Improvement

AT&C losses

Approach for fixing the targets

At the time of privatisation the policy directions issued by the GoNCTD specified an opening level of loss (AT&C loss) for each utility and specified a loss reduction trajectory over the reform period. These loss targets were accompanied by a sharing mechanism to ensure the consumer do not loose because of lowering of loss levels¹. It was agreed that the revenue benefits of any loss reduction between the accepted level (negotiated level) and the Government stipulated target would accrue to consumers through reduced tariffs. As given in the policy directions of the Government, the benefits of reductions beyond the Government stipulated targets would be shared between consumers and the discoms in a 50:50 ratio, and any losses due to underachievement below the negotiated targets would be borne by the discoms.

Table 4.12 indicates the opening level of AT&C loss approved by the DERC, AT&C loss reduction indicated in the accepted bid (negotiated level) and the minimum AT&C loss reductions stipulated by the Government for each discom.

Table 4.12 Accepted loss levels vis-à-vis the Government stipulated loss levels (%)

Description	Opening level	FY 2002-03	FY 2003-04	FY 2004-05	FY 2005-06	FY 2006-07
BRPL	48.1					
Accepted bid (Negotiated level)		0.55	1.55	3.30	6.00	5.60
Minimum level (Govt. stipulated)		1.25	5.00	4.50	4.50	4.00
BYPL	57.2					
Accepted bid (Negotiated level)		0.75	1.75	4.00	5.65	5.10
Minimum level (Govt. stipulated)		1.50	5.00	5.00	5.00	4.25
NDPL	48.1					
Accepted bid (Negotiated level)		0.5	2.25	4.5	5.5	4.25
Minimum level (Govt. stipulated)		1.50	5.00	4.50	4.25	4.00

SOURCE Tariff orders issued by DERC for various years

¹ This is because the negotiated/accepted loss levels were lower than the loss levels specified by the Government

The total reduction accepted by the discom and that stipulated by the Government over the transition period has been summarised in Table 4.13.

Table 4.13: Cumulative reduction over the reform period (July 2002 to March 2007) (%)

Discom	Government stipulated reduction targets	Accepted (negotiated) targets
BRPL	17.00	19.25
BYPL	17.25	20.75
NDPL	17.00	19.25

SOURCE Tariff orders for various years

The DERC has therefore followed the trajectory provided in the policy directions in approving the loss levels for each year.

Performance vis-à-vis the targets

Table 4.14 highlights the actual AT&C loss level achieved by the discoms over the last three years. As seen, each discom has overachieved the target set for them.

Table 4.14 AT&C loss achieved by the discoms vis-à-vis the targets

Description	BRPL			BYPL			NDPL		
	03-04	04-05	05-06	03-04	04-05	05-06	03-04	04-05	05-06
AT&C loss target	46.00	42.70	36.70	54.70	50.70	45.05	45.35	40.85	35.35
AT&C loss level achieved	45.06	40.64	35.53	54.30	50.13	43.89	44.87	33.79	26.52
Overachievement (under-achievement)	0.94	2.06	1.17	0.40	0.57	1.16	0.48	7.06	8.83

SOURCE Tariff orders issued by DERC for various years

The maximum overachievement has been in case of NDPL where the losses have reduced from 48.1% at the time of privatisation to 26.52% in FY 2005-06.

Table 4.15 Target reduction vis-à-vis the reduction achieved from July 2002 to March 2006

	Target reduction from privatisation to FY 2005-06	Achieved reduction from privatisation to FY 2005-06
BRPL	11.4%	12.60%
BYPL	12.15%	13.30%
NDPL	12.75%	21.60%

SOURCE Tariff orders issued by DERC for various years

Based on the above, the weighted average AT&C loss across Delhi in FY 2005-06 works out to be 35.22% as against 53.9% at the time of privatisation. Thus, the loss reduction for Delhi as a whole has been 18.67%.

Benefit sharing for reduction of losses

The policy directions issued by the GoNCTD specified the following as a method for computation and treatment of over achievement and under achievement of losses.

- In the event of the actual AT&C loss of a discom in any year better (lower) than the level based on the minimum AT&C loss reduction levels stipulated by the Govt. for that year the discoms shall be allowed to retain 50% of additional revenue from such better performance. The balance 50% of additional revenue from such better performance shall be counted for purpose of tariff fixation
- In the event of the actual AT&C loss of a discom in any year worse (higher) than the level based on the AT&C loss reduction levels indicated in the Accepted Bids for that year, the entire shortfall in revenue on account of the same shall be borne by the discom
- In the event of the actual AT&C loss of a discom in any year worse (higher) than the level based on the minimum AT&C loss reduction levels stipulated by the Government for that year but better (lower) than the level based on the AT&C loss reduction levels indicated in the Accepted Bids for that year, the entire additional revenue from such better performance shall be counted for the purpose of tariff fixation

Thus, in accordance with the policy directions each year the above mechanism is considered to derive the benefits that shall accrue to the consumers and those to the discom. In FY 2004-05, the benefits shared with consumers by BRPL, BYPL and NDPL were Rs. 71 Crore, Rs. 12.3 Crore and Rs. 121.8 Crore respectively. In addition, NDPL also retained an amount of Rs. 37.25 Crore in accordance with the above mechanism. No benefit accrued to the other discoms in FY 2004-05.

In FY 2005-06, the benefit on account of loss reduction passed on to the consumers was Rs. 26.35 Crore, Rs. 12.56 Crore and Rs. 13.56 Crore by BRPL, BYPL and NDPL respectively. This trend has continued as the utilities have overachieved the loss targets in FY 2006-07 as well.

Anti-theft measures¹

Under a recent initiative (August 2006) the Delhi Government has deployed the Central Industrial Security Force (CISF), among the largest paramilitary forces, in one of the three distribution zones in the Capital to strengthen anti-power theft

¹ <http://www.thehindubusinessline.com/2006/08/02/stories/2006080202672100.htm>
accessed in November 2006

operations and extend security cover to the distribution utility personnel taking part in the action against electricity pilferage.

The CISF coverage, has been extended initially to high theft area handled by BSES Yamuna Power Ltd and is planned to be extended to the other two zones of the Capital in the due course. The Government expects power theft to come down by 10% annually once CISF gets completely working.

In addition to the above, Special Courts dedicated for handling cases related to power theft have been established at Patparganj (BYPL area), Vikaspuri (BRPL area) and Malviya Nagar (BRPL area).

Status of metering

Table 4.16 highlights the status of metering in Delhi. Complete metering has been achieved at 11 kV feeder and consumer level. However, the metering at DT level is only 44%.

Table 4.16 Status of metering in Delhi

Description	FY 2005-06		
	Nos.	Metered	% Metered
11 kV feeders	1850	1850	100
Distribution transformers	8000	3500	44
Consumers (in lakhs)	26.65	26.65	100

SOURCE www.apdrp.com accessed on 27th November 2006

DT failure rate

Table 4.17 highlights the rate of distribution transformer failure rate in Delhi. As observed there has been a marked improvement after privatisation of DVB and with the privatisation of the distribution business.

Table 4.17 Rate of distribution transformer failure

FY 1998-99	FY 1999-00	FY 2000-01	FY 2001-02	FY 2003-04	FY 2004-05
19.45%	16.95%	18.29%	14.57%	3.86%	1.26%

SOURCE TERI workshop on Delhi Power Reforms: Way Ahead held in August 2005

In order to assess the quality of supply in Delhi, DERC has commissioned a survey along with a market research agency, TNS Mode among 12,000 households in Delhi. The results of the study were not available at the time of this study.

Power purchase by Transco

Table 4.18 shows the proposed and approved power purchase cost of Transco over the last three years. As indicated in Table 4.18 the overall price over the three-year period has remained constant (approved price) though it increased during FY 2004-05.

Table 4.18 Cost of Power purchase over the years (Proposed Vs Approved)

Description	Units Purchased	Cost	Price
	MU	Rs. Crore	Rs./kWh
FY 2003-04			
Proposed	21209	4649	2.19
Approved	21110	4378	2.07
FY 2004-05			
Proposed	22698	5301	2.34
Approved	20679	4504	2.16
FY 2005-06			
Proposed	22727	5312	2.34
Approved	21430	4320	2.07

SOURCE Tariff orders issued by DERC for various years

Source-wise break up of power purchase cost approved by the Commission over the years is presented in Table 4.19.

Table 4.19 Power purchase cost of Transco (approved figures) over the years

Source	FY 2003-04			FY 2004-05			FY 2005-06		
	Units	Cost	Price	Units	Cost	Price	Cost	Total Price	Price
	MU	Rs. Crore	Rs/kWh	MU	Rs. Crore	Rs/kWh	MU	Rs. Crore	Rs/kWh
Central Generating Stations ¹	11466	2178	1.90	12308	2446	1.99	10383	1937	1.87
NJPC	-	-	-	-	-	-	1323	299	2.26
PTC and Other States	22052	488	2.38	1381	380	2.75	64	23	3.61
HPSEB	-	-	-	-	-	-	1383	404	2.92
BTSPS ²	4695	1088	2.32	4566	1078	2.36	4740	1077	2.27
Genco ³	2264	444	1.96	2369	514	2.17	2993	664	2.22
PPCL ⁴	1938	428	2.21	2134	472	2.21	2328	483	2.06
Sub total	22414	4626	2.06	22757	4888	2.15	23214	4886	2.10
Sale to other States	1005	206	2.05	-1344	-288	2.15	-	-	-
Underdrawls	-300	-42	1.40	-295	-95	3.18	-1784	566	3.17
Total Power Purchase	21110	4378	2.07	20679	4504	2.16	21430	4320	2.07

SOURCE Tariff orders issued by DERC for various years

Table 4.19 clearly highlights that power from central generating stations is cheaper than its own generation and power from any other source. Power purchased from PTC acts the costliest sources of power to the Transco. One reason for higher cost of own generation is the poor performance of the state –owned plants.

Plant Load Factor of Gencos

The PLF of Delhi's own generating stations for the last seven years have been much below the all India average (Table 4.20). The low level of capacity utilization reflects poor performance of its power stations. The forced outage rates of its generating

¹ Includes NTPC, NHPC and NPC

² Badarpur Thermal Power Station

³ State Generating Stations viz. Indraprastha Power Station, Rajghat Power Station, Indraprastha Gas Turbine Station

⁴ Pragati Power Corporation Limited

plants are high compared to all India average, which brings down the availability of plants. Due to ageing, poor PLF and fuel availability, the plants are able to generate only 400-500 MW from an installed capacity of nearly 1000 MW. The cost of power generation from owned power plants is also high due to low level of capacity utilization and high specific fuel consumption brought about by the age of the plants.

Table 4.20 Plant Load Factor of Delhi's Power Stations

Year	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
I.P.	39.0%	39.9%	37.5%	28.6%	35.4%	36.9%	45.42%
R.P.H	79.4%	66.8%	59.7%	71.7%	65.2%	66.0%	48.5% ¹
G.T.	32.0%	49.1%	47.2%	49.1%	49.0%	62.32%	70.46%
P.P.S	-	-	-	65.4%	83.0%	88.27%	
Overall PLF	44.5%	49.27%	45.1%	43.6%	47.2%	-	56.81%
All India	67.3%	69.0%	70.0%	72.1%	72.7%	74.8%	73.6%

SOURCE: Economic Survey of Delhi 2003-04; Annual Report Annual Report on the working of State Electricity Boards and Electricity Departments, May 2002, Planning Commission, Gol; Annual Report 2004-05, Ministry of Power, Gol; website of Indraprastha Power Generation Co. Limited <http://ipgcl-ppcl.com>

Bulk Supply Tariff to Discoms

As per the policy directions issued by GoNCTD the retail tariffs for the three distribution companies have to identical till the end of FY 2006-07, i.e. consumers of a particular category shall pay the same retail tariff irrespective of their geographical location.

In view of the above, under a conventional tariff determination process, the ARR and BST for Transco is independent of the ARRs and Tariffs for Discoms. Moreover, the ARR and tariff of a Discom depends on the BST of Transco and its internal parameters, but they are independent of ARRs and tariffs of other discoms. The policy directions require the retail supply tariffs to be same for all the licensees and the tariffs is to be determined such that distribution licensees earns at least 16% return on equity and free reserves. Further, the AT&C losses for the purpose of tariff determination shall be taken as the AT&C loss levels committed by the distribution licensees.

The provision of uniform retail tariff makes it necessary that the retail tariff for all the discoms is determined simultaneously by considering their ARRs collectively. Further, the provision of 16% return translates into a situation wherein after covering all their prudently incurred expenses, the Discoms get 16% return. In other words, out of the revenues from tariff and other charges available with the Discoms, the Discoms get a clear 16% return.

¹ Delhi Power Profile (As in June 2006), www.infraline.com

The prevailing levels of Retail Supply Tariffs (RST) and AT&C losses were such that the revenues available with a discoms, i.e. $RST \times \text{Units Realised} = RST \times \text{Units purchased} (1 - \text{AT \& C loss})$, is insufficient to meet the ARR of discoms if it is calculated as per conventional process with average BST of Transco for its power purchase cost. Thus, the RST as calculated as per the equation above shall be required to meet the revenue requirement of Transco and discoms. But at existing RST and AT&C level, this revision in RST shall mean high tariff shock for consumers. In order to avoid this tariff shock, the Government stepped in and in the policy directions provided that the short fall in revenue requirement shall be made by a loan support to Transco. The Government had estimated this support amount to be about Rs. 3450 Crore over the five-year period of policy directions. The discoms shall pay to Transco the bulk supply price from their revenues after meeting all their prudently incurred expenses and the 16% return.

In other words, the BST for the discoms is to be determined based on its paying capacity after meeting all its expenses other than power purchase (i.e. ARR excluding power purchase cost). Also, the total ARR of the discoms, including power purchase cost, is equal to the revenues, which it gets, from tariffs and other charges leaving no revenue gap for the discoms.

The above scheme makes the determination of BST for each discom independent of the ARR excluding power purchase cost of the discom. That is to say that BST payable to Transco cannot be determined by Transco's ARR, but needs to be determined from ARRs of individual discoms. This makes it necessary to process petitions from Transco and discoms simultaneously to arrive at the BST and revenue gap of Transco.

In accordance with the above guidelines, Table 4.21 highlights the bulk supply tariff approved by DERC for the three discoms over the last three years. As seen it has increased by approximately 35-40% over the two-year period.

Table 4.21 Bulk supply tariffs to the discoms over the years

Description	BRPL	BYPL	NDPL
FY 2003-04			
ARR excl. power purchase cost (Rs. Crore)	391	213	329
Revenue at existing tariff (Rs. Crore)	1745	926	1248
Electricity Duty (Rs. Crore)	80	48	61
Amount Available for power purchase (Rs. Crore)	1275	665	859
Units Input (MU)	7966	5280	5451
<i>Bulk Supply Tariff (Paise/kWh)</i>	<i>160.06</i>	<i>125.95</i>	<i>157.59</i>
FY 2004-05			
ARR excl. power purchase cost (Rs. Crore)	390	250	358

Description	BRPL	BYPL	NDPL
Revenue gap of FY 2003-04 (Truing up)	48	29	10
Revenue at proposed tariffs (Rs. Crore)	1964	1038	1400
Regulatory Asset (Rs. Crore)	267	138	192
Electricity Duty (Rs. Crore)	87	47	64
Amount Available for power purchase (Rs. Crore)	1743	830	1141
Units Input (MU)	8391	5307	5392
<i>Bulk Supply Tariff (Paise/kWh)</i>	<i>207.72</i>	<i>156.40</i>	<i>211.61</i>
FY 2005-06			
ARR excl. power purchase cost (Rs. Crore)	468	308	415
Revenue at proposed tariffs (Rs. Crore)	2469	1263	1677
Electricity Duty (Rs. Crore)	98	51	69
Amount Available for power purchase (Rs. Crore)	1903	904	1194
Units Input (MU)	8609	5106	5655
<i>Bulk Supply Tariff (Paise/kWh)</i>	<i>221.05</i>	<i>177.05</i>	<i>211.14</i>

SOURCE Tariff orders issued by DERC for various years

Power purchase cost by the discoms is approximately 73% of the total ARR each year.

Operating expenses

Employee cost

For approving the employee cost the Commission scrutinized the methodology adopted by the discoms in estimating the employee cost and the actuals submitted by the discoms. It also undertook technical sessions with the officials of the discoms.

In FY 2003-04, instead of applying a growth rate on the total employee cost the Commission projected each component separately. Critical assumptions made by the Commission in projecting the employee cost of FY 2003-04 are given below: -

- Salary – A growth of 3% was considered in the average salary per employee per month over FY 2002-03
- Dearness Allowance – Increase of 6.09% considered over the average DA per employee per month in FY 2002-03, assuming DA revision twice in a year
- Adhoc payment of corporatization – Projection based on Rs. 500/- paid to each employee transferred from the Delhi Vidyut Board (DVB)
- Terminal benefits – Contribution to terminal benefit liability funds considered at 26% of the Salary and DA for FY 2003-04. In addition, the difference between the actual contribution towards terminal benefits for FY 2002-03 estimated at 26% of basic pay and DA, has been adjusted in the Terminal benefit contribution approved by FY 2003-04
- Other components such as staff welfare, other allowances, medical reimbursements, and bonus/ex-gratia considered

on proportionate basis based on actual expenses during FY 2002-03

In addition to the above, the Commission has considered capitalization @ 10% of the gross employee cost as against 12% proposed by the petitioners (BRPL and BYPL) and 9% by NDPL.

In FY 2004-05, the Commission in estimating the components of employee cost used the following criteria: -

- Basic Salary: Considered Merger of part of the DA with basic and a growth of 3% on Basic Salary
- Dearness Allowance: Out of prevailing DA @ 59% of Basic, DA equivalent to 50% of Basic has been merged with Basic. DA of 11% of Basic as per prevalent rates has been considered for FY 2004-05
- Terminal Benefits - 26% of the Basic plus DA
- Other Allowances: Considered as proportion to the Basic, as these components are linked to the Basic Salary
- Other components: Other heads such as staff welfare, other allowances, medical reimbursements, and bonus/ex-gratia, considered on proportionate basis based on the actual expenses during FY 2004-05.

In FY 2004-05, the petitioners had submitted that they have incurred Rs. 318 Crore towards Special Voluntary Retirement Scheme. Based on the submissions of the petitioners, the Commission considered and assessed two options for amortization of cost of VRS i.e. amortization of entire SVRS expense within 1 year and amortization of SVRS expense by spreading it over next 2-3 years through savings in employee costs. The Commission agreed with the view of the petitioner that the entire amount cannot be passed in one year and accordingly considered the second option. It was analysed that with the implementation of scheme, there will be savings in the employee expenses, but there will be an increase in other expenses, for example, outsourcing of meter reading and billing activities, due to reduction in number of employees. These additional expenses will form a part of A&G expenses.

The Commission estimated a total saving in the employee cost as Rs. 131 Crore per annum (for BRPL, BYPL and NDPL) and additional expenditure on metering and billing operations was estimated as Rs. 16 Crore per annum (which shall form a part of A&G expenses). Thus, the net saving worked out to be Rs. 115 Crore. Thus, considering the total one time liability of the petitioners towards SVRS, the payback period worked out to be 2.8 years to 3.5 years for the discoms.

However, the DVB Employee Terminal Fund 2002 filed a response on the ARR petition that the Discoms have not

consulted the Trust before declaration of VSS/SVRS and the trust has not made any commitment to the Discoms to discharge the liabilities arising on these Schemes. The Trust also mentioned that the Discoms have not included liability arising out of VSS/SVRS and have not projected the same in their ARR. As estimated by them, the liability works out to be Rs. 796.45 Crore. The Trust submitted that VRS liability is a legitimate charge on the tariff since it would be a measure designed to improve efficiency and reduce establishment costs over time.

In view of the options worked out by the Commission and the issues raised by the Trust, the Commission amortised the SVRS expenses over the next 2-4 years. The Commission therefore projected the employee expenses without considering the costs of VSS and savings in employee costs due to VSS. The increase in A&G expense on account of outsourcing of meter reading and billing expenses has also not been considered by the Commission in the ARR. This method of treatment of VSS outgo and its savings will be beneficial to the consumers, as it maintains the employee costs at prudent levels and will be tariff neutral for around 2-4 years. Once the net savings in employee expenses are equivalent to VSS cost along with its holding cost, the substantial reduction in employee expenses will also be passed on to consumers in ARR and tariffs. The above arrangement that was worked out by the Commission was subject to the final settlement to be arrived at between the Discoms and the Trust.

In FY 2005-06, the Commission adopted the similar approach towards treatment of SVRS and estimating various components of employee cost. The increase in DA for FY 2005-06 was considered at 6%.

Table 4.22 shows the total employee cost proposed by the petitioners and that approved by the Commission. As observed for each of the year, the employee cost approved has always been less than that proposed by the discoms. Further, except in FY 2003-04 the actual employee cost has exceeded the approved amount with all the discoms exceeding their respective approved amounts.

Table 4.22 Employee cost (Proposed, Approved and Actual) over the years

Year	Petition Rs. Crore	Order Rs. Crore	Actual Rs. Crore
FY 2003-04			
BRPL	143.0	137.9	132.4
BYPL	114.0	113.3	111.8
NDPL	128.2	106.0	103.0
Total	385.2	357.3	347.2
FY 2004-05			
BRPL	168.1	139.4	178.3
BYPL	140.3	118.7	141.3

Year	Petition	Order	Actual
	Rs. Crore	Rs. Crore	Rs. Crore
NDPL	125.7	119.4	129.8
Total	434.2	377.5	449.4
FY 2005-06			
BRPL	188.0	150.5	167.5
BYPL	155.4	131.4	133.4
NDPL	140.0	126.9	143.6
Total	483.4	408.8	444.5

SOURCE Tariff orders issued by DERC for various years

In the tariff petition for FY 2004-05, BRPL and BYPL have submitted that the increase in employee expenses was on account of the following reasons: -

- Recruitment of several professional employees for increased level of activities relating to system improvement and reduction of AT&C losses
- Increase due to provision of medical allowances and uniform allowances applicable to employees as per the staff rules for erstwhile DVB employees

While in its ARR petition, NDPL pointed out the following reasons: -

- Increase due to provision of "Medical Allowances and Uniform Allowance" applicable to employees as per the staff rules for erstwhile DVB employees.
- Creation of new departments to handle various functions like, billing, collection, training and Business Process Re-engineering.
- Induction of trainees, who will be specially trained to handle the various technical complexities.
- Increase in costs due to expectation that majority of the employees will avail of LTA during the current year.

Figure 4.7 shows the movement in total employee cost i.e. proposed, approved and actual graphically.

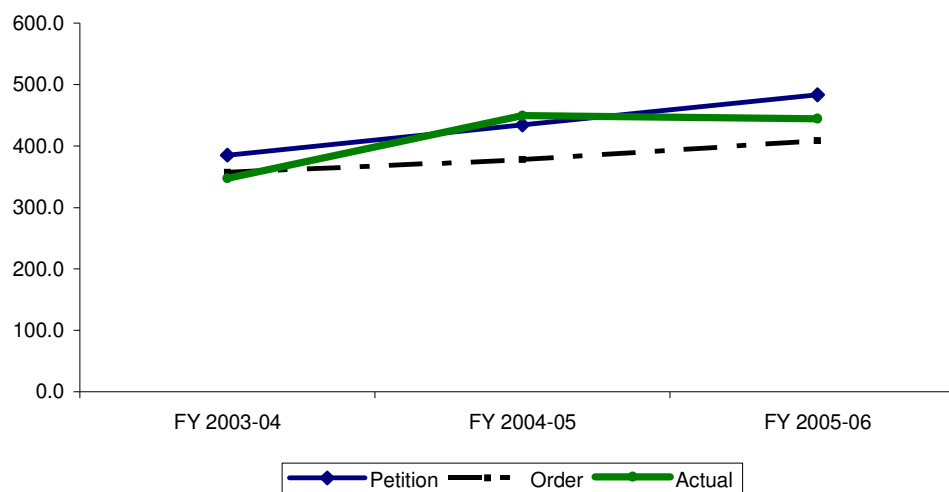


Figure 4.7 Total employee cost (Proposed, approved and actual) over the years

SOURCE Tariff orders issued by DERC for various years

Table 4.23 highlights the break-up of various components of employee cost as approved by the Commission for each discom. The increase approved by the Commission was 5.7% in FY 2004-05 and 8.3% in FY 2005-06 against the proposed increase of 12.7% and 11.3% respectively.

Table 4.23 Break-up of employee cost approved by the Commission for all the discoms over the last three years

Components	FY 2003-04				FY 2004-05				FY 2005-06			
	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total
Salaries	73.2	60.0	40.3	173.5	77.4	64.8	59.7	201.9	79.8	66.7	61.5	208.0
Dearness Allowance	27.6	23.2	21.7	72.5	8.5	7.1	7.2	22.8	11.5	9.6	8.9	30.0
Terminal Benefits	33.9	28.0	18.2	80.1	14.1	11.8	12.0	37.9	14.6	12.1	12.6	39.3
Other Costs	18.6	14.6	37.6	70.8	54.8	48.3	54.5	157.6	56.5	49.7	56.2	162.3
Total Employee Expenses	153.2	125.9	117.8	397.0	154.9	131.9	133.4	420.2	162.3	138.1	139.1	439.5
Less: Expenses Capitalized	15.3	12.6	11.8	39.7	15.5	13.2	13.3	42.0	11.8	6.7	12.2	30.7
Net Employee Expenses	137.9	113.3	106.0	357.3	139.4	118.7	119.4	377.5	150.5	131.4	126.9	408.8

SOURCE Tariff orders issued by DERC for various years

Employee productivity

Table 4.24 indicates various parameters to analyse the employee productivity in of the discoms in Delhi.

Table 4.24 Trends in indicators of employee productivity

Year	Employee cost as a% of ARR	Employee cost per unit of sale	No of employees per thousand consumers	Revenue per employee
	%	Rs./kWh	Nos. per thousand	Rs. Crore.
FY 2003-04	9.59%	0.336	6.68	0.23
FY 2004-05	9.61%	0.344	5.47	0.31
FY 2005-06	8.09%	0.326	5.63	0.35

SOURCE TERI estimates

As observed, the employee cost as a percentage of ARR (approved by DERC) has decreased over the last three years indicating improvement in the employee productivity. Other parameters viz. employee cost per unit of sale, number of employees per thousand consumers and revenue per employee have also increased indicating improvement in employee productivity. The above trends are highlighted graphically in Figures 4.8 and Fig 4.9.

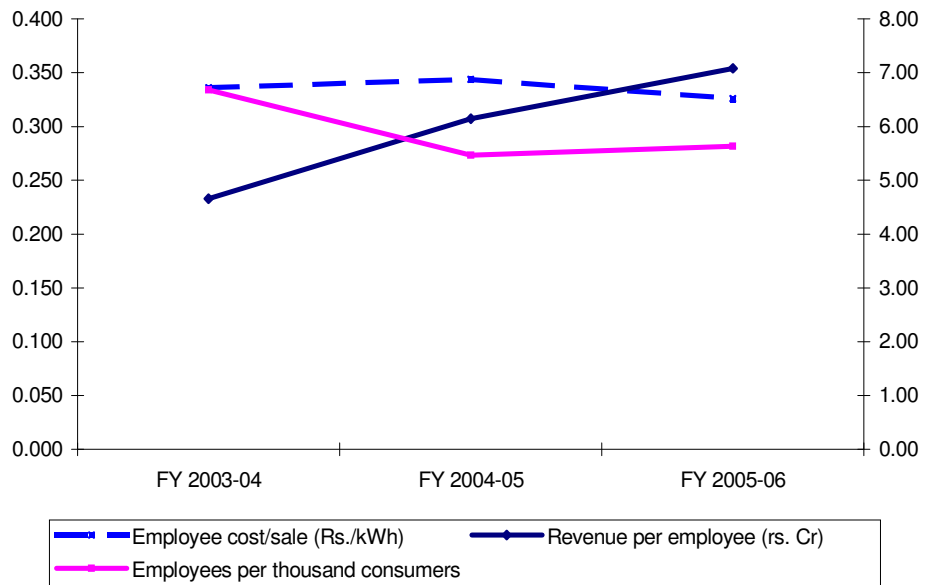


Figure 4.8 Trends in employee productivity
SOURCE TERI estimates

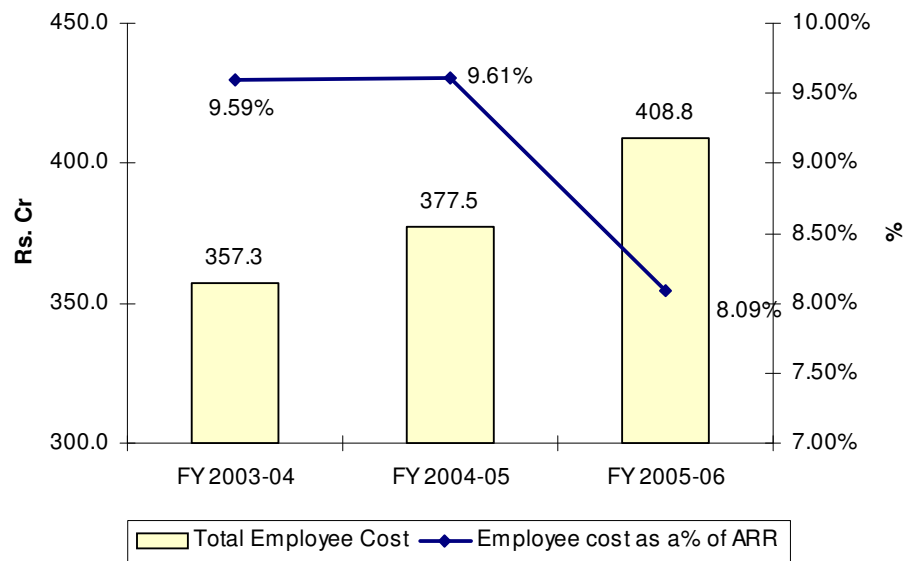


Figure 4.9 Trends in employee productivity

SOURCE TERI estimates

Repair and Maintenance expenses (R&M Expenses)

For estimating the R&M expenses each year, the Commission has considered the actuals for that year and the discussions held with the officials of the discoms during the technical sessions. Also, the Commission has considered the amount spent in replacement of meters and transformers against defective meters as part of capital expenditure and accordingly reduced the amount proposed by discoms as part of R&M expenses.

Table 4.25 highlights the R&M expenses (proposed, approved and actual) over the years. As observed, the actual R&M expenses have exceeded the approved amount in all the years.

Table 4.25 R&M expenses (Proposed, approved and actual) over the years

	FY 2003-04				FY 2004-05				FY 2005-06			
	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total
Petition	72.10	54.30	42.22	168.62	62.88	41.14	63.86	167.88	74.51	49.89	55.61	180.01
Order	52.57	31.31	32.16	116.04	52.57	31.31	32.16	116.04	71.75	48.04	55.83	175.62
Actual	60.43	34.79	55.26	150.48	92.00	64.58	57.71	214.29	73.60	51.89	55.09	180.58

SOURCE Tariff orders issued by DERC for various years

In FY 2004-05, the Commission directed the petitioners to maintain a separate record of the items issued from the stores for R&M works, and submit the same to the Commission along with the details of the actual R&M Works carried out at the end of each quarter. The report on transformer failure rate was also to be submitted on a quarterly basis along with the above data on the R&M items issued.

In addition, the Commission also directed the petitioners to clearly demarcate expenditure related to replacement of meters, transformers and switchgears and include the same in capital expenditure in future submissions. Further, the petitioners were directed to take prior approval for any increase in R&M expense during FY 2004-05 beyond the approved R&M expense before committing/incurred an expense.

Figure 4.10 highlights the R&M expenditure as a percentage of opening level of gross fixed assets of that year (approved figures). For most of the utilities this percentage lies between 1% and 3%. It is marginally higher in case of Delhi and has increased over the FY 2003-04 levels.

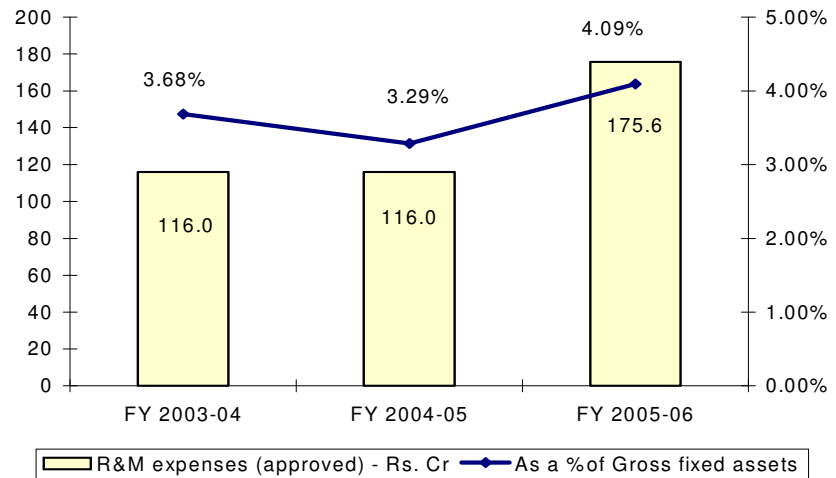


Figure 4.10 R&M expenses as a percentage of gross fixed assets

SOURCE TERI estimates

Administration and General Expenses

For estimating the A&G expenses each year, the Commission has considered the actuals for that year and the discussions held with the officials of the discoms during the technical sessions.

In FY 2003-04, the Commission has separately projected various components of A&G expenses. The average growth rate in most of the components has been considered as 8%. However, some components such as insurance, consultancy charges etc have been considered at the annualised levels of FY 2002-03.

In FY 2004-05, the Commission considered an escalation of 5% for some of the components, which worked out to be 4% on the overall A&G expenses. Further, the Commission stated that since the number of employees in the discoms has reduced due to implementation of SVRS, A&G expenses are likely to come down. It therefore, approved an amount equivalent to the revised figure approved by it for FY 2003-04.

In the tariff petition for FY 2004-05, the petitioners provided the following reasons for increase in the A&G expenses.

These are given below: -

- Increase in Insurance costs
- Higher property tax based on unilateral increase in the property tax by MCD
- Telephone charges increased on account expenditure expected due to the provision of mobile telephones to all field personnel. The expenses relating to the operation of

the call centre for handling no-supply complaints are included

- Inclusion of rent related to new building for the petitioners office
- Consultancy services for business process mapping and development of customer relationship management systems

The petitioners also submitted the reasons for projecting a higher amount for FY 2005-06 as follows: -

- Increase in the rents
- Telephone charges increased on account expenditure expected due to the provision of mobile telephones to all field personnel and higher expenses relating to the operation of the call centre for handling no-supply complaints
- Increase in insurance premium
- Consultancy services for business process mapping and development of customer relationship management systems
- Growth rate of 15% in other expenses (BRPL and BYPL) and 12% (NDPL)

In FY 2005-06, the Commission considered a 4% escalation on A&G expenses on the actuals for FY 2004-05¹ for NDPL. For BRPL and BYPL the Commission based on the actuals for FY 2004-05 reported made suitable adjustments and provided an escalation of 4% on the same. In addition, the Commission also directed the petitioners to take approval of any amount incurred/committed towards A&G expenses beyond the approved levels.

Table 4.26 gives the A&G expenses proposed, approved and actual A&G expenditure over the years. For each of the year under study, it is observed that the approved expenditure has been much lower than that proposed by the discoms. Further, the actual expenditure has exceeded both the approved and the proposed figures.

Table 4.26 A&G expenses (Proposed, approved and actual) over the years (in Rs. Crore)

	FY 2003-04				FY 2004-05				FY 2005-06			
	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total
Petition	26.0	20.5	23.9	70.5	39.6	23.0	23.7	86.2	37.3	24.5	21.5	83.3
Order	15.2	10.8	18.3	44.3	8.0	12.1	18.9	39.1	30.2	17.3	20.0	67.5
Actual	32.2	21.2	18.9	72.4	41.1	26.6	19.2	86.9	61.2	33.4	22.3	116.9

SOURCE TARIFF orders issued by DERC for various years

¹ Here too the petitioner provided several reasons for high level of A&G expenses.

For each of the year it is observed that the approved expenditure has been much lower than that proposed by the discoms. Further, the actual expenditure has exceeded both the approved and the proposed figures.

Figure 4.11 highlights the A&G expenses per unit of sale and as a % of ARR. Both the parameters have increased indicating decline in the productivity. The figures would increase further if actual A&G expenditure was considered.

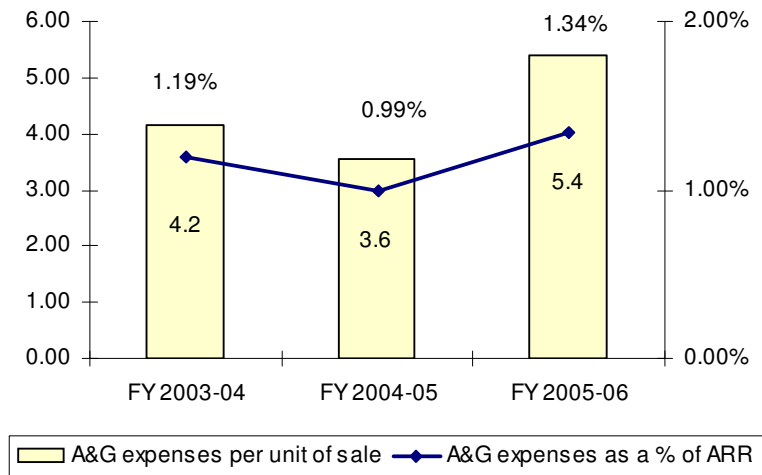


Figure 4.11 A&G expenses as a percentage of ARR over the years (approved)

* Based on approved figures

SOURCE TERI estimates

Total operating expenses

Table 2.27 highlights the operating expenditure that includes employee cost, R&M and A&G expenses over the years.

Table 4.27 Total operating expenses over the years

Year	Proposed Rs. Crore	Approved Rs. Crore	Actual Rs. Crore	Per unit of sale* Paise/unit	As a % of ARR %
FY 2003-04	624.23	517.62	570.06	48.7	13.90%
FY 2004-05	688.29	532.61	750.53	48.5	13.56%
FY 2005-06	746.72	651.83	741.95	52.0	12.91%

*Based on approved figures

SOURCE Tariff orders issued by DERC for various years

As observed O&M expenses per unit of sale has increased in the last three years indicating decline in productivity. One reason for the same has been that the expenses have increased at a rate higher than that in sales. The operating expenses (approved) increased by 2.9% and 22.3% in FY 2004-05 and FY 2005-06 respectively whereas sales (approved) increased by 3.3% and 14.2% over the same period. Within operating expenses, the

increase has been higher (in percentage terms) in the R&M and A&G expenses.

Operating expenses as a % of ARR have, however, shown marginal improvement.

Depreciation

In FY 2003-04, the petitioners proposed depreciation at the rate of 6.69% on the original cost of fixed asset at the beginning of the year. The Commission, however, approved the depreciation at the rate of 3.75% in accordance with the MoP Norms notified in March 1994. This was estimated by applying norms laid down in the notification that specify the fair life of the lines and cables network of distribution system as 25 years. This was applied to the asset such that 90% of the asset value is depreciated over the fair life of the asset. In addition, the Commission also highlighted absence of a detailed fixed asset register (FAR) and directed the petitioners to prepare the same.

In FY 2004-05, the petitioners again proposed depreciation rates of 8.17% (BRPL), 7.67% (BYPL) and 7.35% (NDPL). However, the Commission approved a depreciation rate of 3.75% reiterating the stand taken by it in the tariff order for FY 2003-04.

Quote

“The Commission is of the view that the depreciation computed at the rate of 3.75% may be higher or lower than the rate based on the actual FAR, and is of the opinion that this can be adjusted against the actual depreciation chargeable, under the truing up mechanism. In absence of details of CWIP and the historical value of various categories of assets, the Commission has continued to use the depreciation rate at 3.75% for the purpose of the ARR considering the average fail life of the lines and cables network of distribution voltages as 25 years.

The Commission is of the view that as depreciation is a non-cash expenditure and there is no scheduled loan repayment, the reduction in the depreciation expenditure will not affect the Petitioner’s operations as all legitimate and prudent expenditure is being considered for the purposes of determination of the ARR. Accordingly, the Commission has continued to use the depreciation rate of 3.75% for the purposes of the ARR.

Unquote

The Commission further explained the methodology for allowing a higher depreciation for repayment of loans in its tariff order for FY 2003-04, that when the loan repayment commences in future, then the Petitioners may require higher

cash flow to meet the repayment obligations. In such case, the Commission opines that it would be appropriate to consider various mechanisms to enable building in a higher cash flow, including an advance against depreciation¹.

In FY 2005-06, the Commission decided to consider the depreciation rates prescribed in Annexure II of the CERC (Terms and conditions of tariff) Regulations, 2004. The weighted average depreciation rate as computed by the Commission worked out as 3.32%.

The issue of depreciation (along with other issues viz. method of calculating Return on Equity, Allowing of Deferred Tax etc) was contested by the petitioners by an appeal before Appellate Tribunal for Electricity. The Petitioner's contention was to allow depreciation as per the rates prescribed in 1994 Notification issued by the Ministry of Power. The Appellate Tribunal for Electricity in its order dated 24th May 2006 has upheld the methodology adopted by the Commission in all the issues raised by the Petitioner except that of depreciation. With regard to the issue of depreciation, the Appellate Tribunal for Electricity in its order has mentioned the following: -

In Para No. 15 of Order

“The claim for accelerated depreciation merits acceptance. There is no escape except to allow depreciation in terms of Schedule VI of the Electricity (Supply) Act, 1948. Though discretion is given to the Commission under sub section (3) of Section 28 to depart, the Commission has not chosen to do so and, therefore, it follows that the appellants are entitled to depreciation at the accelerated rate as notified by the Ministry of power, Government of India. Provision has been made for depreciation of machinery, equipment and buildings, plants, machines, transmission lines, etc. When the Statute itself provides for allowing depreciation at the rate notified, there is no reason for the Commission to fix different rate of depreciation far below the notified rate and that too without recording reasons. Hence, while sustaining the contention advanced by the appellants on this point and rejecting the contentions advanced on behalf of the Commission, we direct the Commission to allow depreciation as per the notification of the Ministry of Power issued in terms of paragraph (a) of paragraph (VI) of the Sixth Schedule for the tariff periods in Question. We do not find any justification or reason to deny depreciation as claimed by the appellants in all the appeals.”

¹ Since there was no loan repayment liability envisaged by the Petitioners for FY 2003-04 and FY 2004-05, the Commission considered utilization of depreciation for meeting the working capital requirement and funding capital investments in line with the priority of utilization viz. loan repayment (if any), working capital requirement, capital investment.

In Para No. 16 of Order

“Instead of ourselves examining and going into the matter, we direct the appellants to go before the Regulatory Commission, place, satisfactory material with respect to the fixed assets shown in FAR, its value and other details and subject to the prudence check, the Regulatory Commission shall consider the claim on merits and allow depreciation. Though reliance was placed on Pronouncements of the Supreme Court, in our view, it is not necessary to refer to the same, as it is mandate of the Statute, which the Commission is bound to give effect. The statutory provision being mandatory, it is obligatory for the Commission to allow depreciation at the rate notified by the Ministry of Power and there is neither a reason nor justification to deviate or depart from the Para VI of the Schedule to the Electricity (Supply) Act, 1948.”

In Para No. 22 of Order

“In the circumstances, we direct the Commission to afford another opportunity to DISCOMS to produce the various registers or FAR, etc., place materials with respect to the claims relating to its fixed assets or investments or interest allowance made after the effective date, from which the DISCOMs became operational. In the truing up exercise, the Commission shall undertake such an exercise and the appellants shall be afforded sufficient opportunity to produce materials in support of their individual claims.”

In Para No. 23 of Order

“In other respects, we do not find any error or illegality in the Tariff Order, warranting interference. We hold that the Tariff Orders passed by the Regulatory Commission as well as ARR Order by the Regulatory Commission in respect of appellants/DISCOMs and the tariff determination for the years in Question in other respect are not liable to be interfered, except to the extent indicated above.”

In conclusion, with regard to appeal of the Petitioner whether they are entitled to depreciation @ 6.69% and whether the depreciation allowed @ 3.7% is legal and in order, the Appellate Tribunal for Electricity mentioned that this point is answered in favour of appellant in each of the appeal and the Regulatory Commission shall grant consequential relief on actuals.

The Commission, consequent to order of the Appellate Tribunal for Electricity directed all the DISCOMs to produce the Fixed Asset Register and other records/materials before the Commission to take up the prudence check/truing up exercise. In response thereto, the Petitioner mentioned that the Fixed Assets Register (FAR) as on 1st July 2002 had been submitted with the Commission vide letter dated 21st July 2003. The

aforesaid FAR includes break up of valuation in respect of various categories of assets as on 1st July 2002. It was prepared by an independent Chartered Engineer and duly certified by an independent firm of Chartered Accountants. As regards assets capitalized after taking over i.e. 1st July 2002, petitioners have submitted audited accounts for FY 2002-03, FY 2003-04 and FY 2004-05 which, inter-alia, provide information on additions to and deletions from assets across different categories of assets.

The Commission was of the view that the petitioners have only reiterated their earlier stand of submission of FAR as per business valuation method. The Commission in its previous Tariff Orders had repeatedly mentioned that the FAR submitted by the Petitioner does not provide the historical cost for various categories of assets and the detail of CWIP. Even though another opportunity was given to the Petitioner as directed by the Appellate Tribunal for Electricity, the Petitioner has not produced/placed the satisfactory materials before the Commission.

Meanwhile, the Commission has preferred an Appeal before the Supreme Court of India in Civil Appeal No. 2733 of 2006. The Supreme Court in its Order of 23rd August 2006 directed that the Appellate Tribunal for Electricity to consider the conclusion of the Commission, as if they were good and sufficient for the purpose of making the departure from the Schedule (VI) rates. The Supreme Court highlighted that the basic issue involved in this appeal is whether the Appellate Tribunal was justified in its view that the Commission had not indicated any reason for deviating from (VI) Schedule rates. Without expressing any final opinion, it directed the Tribunal to examine whether the conclusions of the Commission are supportable in facts and in law. It further stated that the Appellate Tribunal should decide the matter after taking into consideration all contentions raised or to be raised by the parties. It however made clear that no interim protection for any period other than the period to which the present appeal relates has been given. The determination made by the Appellate Authority shall be indicated to the parties. The matter shall be placed for further hearing after a period of 6 weeks.

This case has been heard in the Appellate Tribunal for Electricity, which has reiterated its stand made in the order issued on 24th May 2006. The matter has therefore been referred back to the Supreme Court of India and is pending to be heard in January 2007¹.

¹ As per discussions with the officials of DERC

In the mean time, the Commission has issued the tariff order for the FY 2006-07 and has retained a surplus of Rs. 45 crore in the sector in form of “Tariff Control Reserve” to meet any contingency arising out of the aforesaid appeal or any additional liability towards power purchase, which may arise during the FY 2006-07 etc.

In FY 2006-07, the Commission had continued with the methodology of depreciating the assets up to a cumulative 90% uniformly over the entire useful life of the assets and considered the weighted average depreciation rate as per the opening block of fixed assets submitted by the Petitioner at the rates prescribed in Appendix – II to Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulation 2004 for various asset classes.

Table 4.28 compares the depreciation amount proposed by the discoms and that approved by the Commission over the last three years. As seen the actual depreciation has been much higher than the approved amounts with all the discoms exceeding the approved amounts each year.

Table4.28 Depreciation (Proposed Vs Approved) for discoms over the years

Description	FY 2003-04				FY 2004-05				FY 2005-06			
	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total
Petition	133.9	49.9	106.2	290.1	155.4	50.8	113.8	320.0	138.8	64.0	102.1	305.0
Order	58.2	14.4	45.6	118.2	62.2	17.3	53.0	132.5	73.2	32.2	60.8	166.2
Actual	114.8	32.0	87.5	234.3	126.4	43.5	112.8	282.8	87.5	36.6	64.8	188.8

SOURCE Tariff orders issued by DERC for various years

Table 4.29 summarizes the depreciation rates proposed by the petitioners for various years and the rates approved by the Commission along with the basis for approval. It clearly highlights that there has been a difference in the rates of depreciation proposed by the petitioners and that approved by the Commission.

Table4.29 Depreciation rates (Proposed Vs Approved)

Year	Depreciation rate (%)		Basis for approved rates
	Proposed*	Approved	
FY 2003-04	6.69	3.75	MoP Notification, 1994
FY 2004-05	7.35 to 8.17	3.75	MoP Notification, 1994
FY 2005-06	5.79 to 8.77	3.32	CERC (Terms and conditions of tariff Regulations, 2004)

* Calculated based on the depreciation and opening value of GFA proposed by the petitioners

SOURCE Tariff orders issued by DERC for various years and TERI estimates

Sources of funds

In the tariff petitions filed by the petitioners over last three years, the petitioners have proposed funding of the capital

expenditure through a mix of APDRP funds, depreciation, consumer contribution, cast, internal accruals and domestic loans.

In FY 2003-04, BRPL, BYPL and NDPL proposed an amount of Rs. 362.56 Crore, Rs. 297.97 Crore and Rs. 301.14 Crore respectively as total funding through various sources. The respective amounts approved by the Commission were Rs. 409.44 Crore, Rs. 287.35 Crore and Rs. 278.34 Crore. While the petitioners had not considered APDRP funds as source of finance owing to the uncertainty of timing of its availability due to securitization issues between the GoI and GoNCTD, the Commission considered the same in FY 2003-04. The Commission elaborated in the tariff order that tripartite agreement between the GoI, GoNCTD and Utilities of Delhi was executed in March 2003 and the funds shall be made available in FY 2003-04. It also wrote to the Government for expediting the release of APDRP funds.

The Commission also specified a priority order for availing loans and borrowings. This is given below: -

- Consumer contribution
- Unutilised depreciation considering available unutilised depreciation of the previous years
- APDRP funds available during the year
- Balance funds to be met through a mix of debt and equity by applying a normative debt to equity ratio of 70:30

In FY 2004-05 and FY 2005-06, the Commission has adopted similar approach as in FY 2003-04 and considered the same order of priority as given above. A comparison of the amount proposed each year and that approved by the Commission is given in Figure 4.12.

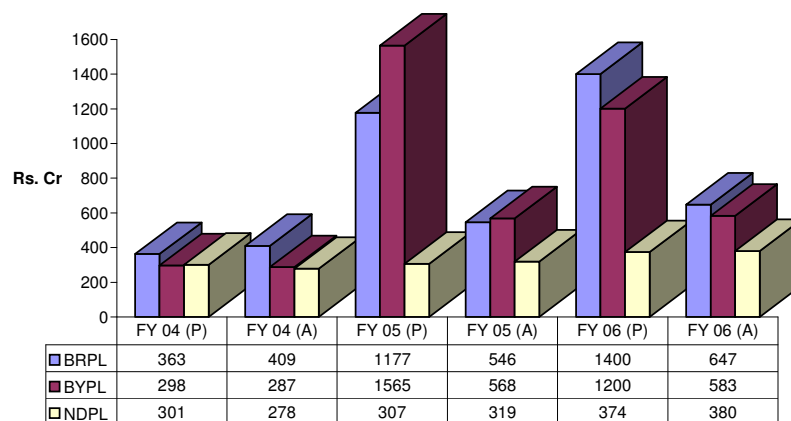


Figure 4.12: Sources of funds for the discoms over the years

SOURCE Tariff orders issued by DERC for various years

As observed, the extent of variation between the proposed and approved amount in case of NDPL is quite low in comparison to that in BRPL and BYPL. Detailed break-up of the source-wise amount approved for each discom in FY 2003-04, FY 2004-05 and FY 2005-06 is highlighted in Table 4.30.

Table 4.30 Break-up of sources of funds over the years (approved) (Rs. Crore)

Description	FY 2003-04				FY 2004-05				FY 2005-06			
	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total
Consumer Contribution	17	1067	22	1106	57	14	22	93	57	20	20	97
APDRP Grant	75	65	62	203	63	55	62	180	0	0	0	0
APDRP Loan	75	65	62	203	63	55	62	180	0	0	0	0
Internal Accruals	54	22	31	108	95	37	42	173	155	31	100	285
Commercial Debts	158	123	72	354	221	408	97	726	362	500	232	1094
Depreciation	29		28	58	48	0	33	82	73	32	29	134
Total Funds	409	287	278	975	546	568	319	1433	647	583	380	1610

SOURCE Tariff orders issued by DERC for various years

Capital expenditure

In FY 2003-04, the Commission approved a total expenditure of Rs. 1046 Crore as against Rs. 1050 Crore proposed by the petitioners. In approving the amount, the Commission held detailed discussions with the petitioners, scrutinized investments already made and preparedness for the summer months. The Commission also conducted sample checks on the investments starting from the material procurement process to installation of equipment and issue of completion certificates¹. To approve the capital expenditure in FY 2004-05, the Commission scrutinized the actual investments made during the previous year (revised estimates) and the plan for FY 2004-05. It also undertook site visits to check the progress and completion status of various works. The total expenditure approved was Rs. 1377 Crore as against a proposed amount of Rs. 2979 Crore. During interactions with the senior management of the utilities the following problems were highlighted the resulted in shortfall of the investment target (BRPL and BYPL):

- Lack of updated field information for a long period during pre-privatisation period and unpreparedness of the erstwhile DVB for long-term execution of capital projects
- Delay in land clearances for substations and road cutting permits from the local authorities
- Delay in few EHV projects due to non-availability of 66 kV bays at the Transco grid stations

¹ In each of the year, the Commission has been considering the cost of new meters, transformers and switchgears replaced against defective components as part of capital expenditure and not in the R&M expenditure proposed by the petitioners. The Commission has also considered a part of survey fees /consultancy charges as part of capital expenditure and not as part of A&G expenses.

The Commission also directed the petitioners to submit the complete DPR along with the cost-benefit analysis for schemes more than Rs. 2 Crore for obtaining the scheme-wise investment approval from the Commission. In addition, in line with the recommendation made by CEA in the Comprehensive Study Report on the Transmission and Sub-transmission System of Delhi, the Commission directed the petitioners to form a Steering Committee with one member as the Commission's representative, within seven days from the date of issue of the order. The Steering Committee was responsible for developing an integrated and consolidated implementation plan and monitoring thereof.

In FY 2005-06 also, the Commission undertook site visits to monitor the progress of the works and also scrutinized the actual expenditure in FY 2004-05 and plan for FY 2005-06. It also held meetings with the officials of the petitioners and brought to the notice of the petitioners that the Commission did not approve part of expenditure incurred by them. Accordingly, the Commission again asked the petitioner to submit schemes-wise details of expenditure incurred and directed the petitioners to submit the complete DPR along with the cost-benefit analysis for all the schemes of more than Rs. 2 Crore on which the capital expenditure has been incurred during FY 2004-05 which were not approved by the Commission earlier and the schemes proposed during FY 2005-06 for obtaining scheme-wise investment approval from the Commission within a month from the date of issue of the order. The petitioners were also to obtain the approval from the Commission for individual schemes less than Rs. 2 Crore but aggregating to Rs. 20 Crore. The Commission also reiterated its direction to the petitioners to submit the quarterly progress report of investments in the prescribed formats.

Table 4.31 Capital expenditure by the discoms over the years

Utility	FY 2003-04			FY 2004-05			FY 2005-06		
	Petition	Order	Actual	Petition	Order	Actual	Petition	Order	Actual
BRPL	363	423	112	1149	526	923	1400	477	496
BYPL	386	336	85	1539	548	418	1165	426	348
NDPL	301	287	287	290	303	328	361	361	382
<i>Total</i>	<i>1050</i>	<i>1046</i>	<i>484</i>	<i>2979</i>	<i>1377</i>	<i>1669</i>	<i>2926</i>	<i>1264</i>	<i>1225</i>

SOURCE Tariff order issued by DERC for various years

As discussed above, each year discoms have fallen short of meeting the proposed investment targets. The Commission in view of the actual trends has been approving a much lower amount than that proposed by the petitioners. Table 4.32 gives the actual capital expenditure over the years as a percentage of proposed and approved amounts.

Table 4.32 Actual capital expenditure as a percentage of approved and proposed amounts

Utility	FY 2003-04		FY 2004-05		FY 2005-06	
	Actual capex as a % of approved	Actual capex as a % of proposed	Actual capex as a % of approved	Actual capex as a % of proposed	Actual capex as a % of approved	Actual capex as a % of proposed
BRPL	26.5%	30.9%	175.5%	80.3%	103.9%	35.4%
BYPL	25.3%	22.0%	76.3%	27.2%	81.7%	29.9%
NDPL	99.9%	95.3%	108.1%	113.0%	105.7%	105.7%
Total	46.3%	46.1%	121.2%	56.0%	96.9%	41.9%

SOURCE TERI estimates

It is evident from the above table that while NDPL's performance has improved over the years, BRPL and BYPL have been quite slow in implementing the works and hence booking the expenditure under various heads in the accounts. Also the overall efficiency of implementing new works has been quite low except in FY 2004-05 where the utilities surpassed the approved amount (except BYPL).

Effectiveness of implementing new works also has an important bearing on the retail tariffs as it forms a part of the ARR approved by the Commission. From the above, it is apparent that the consumers were levied a tariff equivalent to the approved amount, which was higher than the actual amount incurred in the year.

Interest Charges

In FY 2003-04, the Commission approved an interest rate of 12% on APDRP loans and 11% on commercial borrowings considering the prevailing long-term lending rates. In FY 2004-05, the Commission considered an interest rate of 11.5% on the APDRP loans and 9% on the commercial borrowings (as per the prevailing lending rates). In FY 2005-06, the Commission has assumed an interest rate of 8.5% on untied commercial borrowings and as per the loan agreements furnished by the petitioners. Further, the Commission did not consider outstanding loan to the holding company as policy directions stipulated a waiver on interest for the first four years.

Table 4.33 shows the interest charges proposed by the petitioners and that approved by the Commission.

Table 4.33 Interest charges on loans over the years (Proposed, approved and actual)

Year	Proposed Rs. Crore	Approved Rs. Crore	Actual* Rs. Crore
FY 2003-04			
BRPL	29.6	15.8	7.0
BYPL	31.9	15.4	10.0
NDPL	22.5	8.2	6.0
<i>Total</i>	<i>84.0</i>	<i>39.4</i>	<i>23.0</i>
FY 2004-05			
BRPL	51.0	15.7	12.5

<i>Year</i>	<i>Proposed</i>	<i>Approved</i>	<i>Actual*</i>
BYPL	80.0	28.8	24.8
NDPL	25.0	24.5	16.7
<i>Total</i>	<i>156.0</i>	<i>69.0</i>	<i>54.0</i>
FY 2005-06			
BRPL	81.0	36.5	41.3
BYPL	81.7	50.4	45.2
NDPL	34.4	41.7	42.3
<i>Total</i>	<i>197.1</i>	<i>128.6</i>	<i>128.7</i>

* Actuals given here are based on the revised estimates given by the petitioners in the ARR petition

SOURCE Tariff orders issued by DERC for various years

Rate of return

The policy directions issued by the Government of Delhi before the privatisation of the Discoms clearly specifies that the discoms shall earn a 16% return on the equity and free reserves during the transition period. In accordance with these directions, the Commission has been allowing a return equivalent to 16% for all the three discoms.

In FY 2003-04, the total equity base approved by the Commission was Rs. 1023.4 Crore against Rs. 1195.4 Crore proposed by the petitioners. The difference was primarily on account of the approach adopted by Commission to estimate return on the free reserves used to fund the capital expenditure. While the petitioners had proposed return on the entire amount of free reserves, the Commission was of the opinion that the capital investments shall be spread across the year and hence free reserves shall also be invested across the year. Accordingly, the Commission considered the average of the opening and closing free reserves used for funding capital investments. Similarly, in FY 2004-05, the total equity base (including free reserves) proposed by the petitioners was Rs. 1195.6 Crore. The Commission approved an amount of Rs. 1135.3 Crore. In FY 2004-05 too, the petitioners had calculated the return on the equity and free reserves at the end of the year as per the Clause 13 of the policy directions. The Commission in order to clarify the interpretation of the policy directions regarding methodology used to derive the return on equity referred the matter to GoNCTD seeking clarification on the same.

The reply from the GoNCTD dated 16th February 2004 stated that the matter was examined with the Reform Consultant and the GoNCTD agreed with their advice (reproduced below)

Quote

"Regarding the applicability of returns on additions made during the year, it is evident that such additions normally occur due to infusion of fresh equity or due to generation of surplus during the course of operations in a year, which subsequently get invested as assets in the business. Therefore, on applying the

principle stated above, it is clear that the additions made during the year could at best be considered eligible for the returns only for the period in which they are beneficially deployed in the business, which could either be the entire year or a part thereof."

"However, as the exact timing of such generation and deployment of incremental surplus during a financial year is extremely difficult to ascertain, an approximation is generally resorted to whereby the amount eligible for returns is calculated by taking the average of opening and closing balance for a financial year."

"Examination of a few tariff orders of Central Electricity Regulatory Commission (CERC) reveals that CERC has also been adopting a similar methodology for arriving at the eligible amount for calculating return on equity."

"Under the circumstances, we are inclined to suggest that the return on equity may be permitted on the backdrop of the guiding principle that such returns should be applicable for the period when such amounts have been invested into fixed or any other assets, which have been put to beneficial use for the purpose of electricity distribution. Incidentally, the language of the notification also suggests the same intent. However, as conveyed by the legal advisor, we would like to state that it is ultimately for DERC to decide the extent of free reserves admissible for rate of return."

Unquote

Based on the clarification received from the GNCTD, the Commission continued with the methodology of allowing return on equity on initial equity and average of opening and closing free reserves used for funding capital investments.

Similarly, in FY 2005-06, the total equity base approved by the Commission was Rs. 1407.4 Crore against Rs. 2151.1 Crore proposed by the petitioners.

Table 4.34 highlights the return on equity proposed by the petitioners and that approved by the Commission.

Table 4.34 Return on equity and free reserves over the years (Proposed Vs Approved)

Description	FY 2003-04				FY 2004-05				FY 2005-06			
	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total	BRPL	BYPL	NDPL	Total
Petition	98.4	24.8	68.1	191.3	133.4	78.7	94.5	306.5	154.6	107.2	112.9	374.7
Order	79.6	22.4	61.7	163.8	82.9	25.5	73.3	181.7	101.9	30.9	92.4	225.2

SOURCE Tariff orders issued by DERC for various years

ARR

Table 4.35 shows the comparison of the elements of ARR (proposed, approved and actual) over the last three years.

Table 4.35 Annual Revenue Requirement (Proposed, approved and actual)

	BRPL			BYPL			NDPL			Total		
	Proposed	Approved	Actual	Proposed	Approved	Actual	Proposed	Approved	Actual	Proposed	Approved	Actual
FY 2003-04												
Expenditure	507.0	337.0	492.0	306.4	209.0	269.0	445.1	275.8	542.0	1258.5	821.8	1303.0
Return on equity and free reserves	98.4	79.6	100.0	24.8	22.4	25.0	68.1	61.7	79.0	191.3	163.8	204.0
Non-tariff income	31.5	25.3	16.0	21.0	18.1	3.0	6.6	8.9	8.0	59.1	52.3	27.0
ARR excluding power purchase cost	573.8	391.3	576.0	310.3	213.3	291.0	506.6	328.6	613.0	1390.7	933.3	1480.0
FY 2004-05												
Expenditure	635.0	342.0	471.0	432.0	239.0	351.8	489.0	304.0	429.8	1556.0	885.0	1252.6
Return on equity and free reserves	133.0	83.0	113.0	79.0	26.0	34.0	94.0	73.0	94.8	306.0	182.0	241.8
Non-tariff income	17.0	35.0	37.0	4.0	15.0	23.8	11.0	19.0	19.1	32.0	69.0	79.9
ARR excluding power purchase cost	751.0	390.0	547.0	507.0	250.0	362.0	572.0	358.0	505.5	1830.0	998.0	1414.5
FY 2005-06												
Expenditure	512.0	398.0	431.5	369.3	297.6	307.5	409.4	345.3	384.5	1290.7	1040.9	1123.4
Return on equity and free reserves	155.0	102.0	107.2	107.0	30.9	30.9	112.9	92.4	92.2	374.9	225.3	230.3
Non-tariff income	31.0	32.0	57.8	22.4	20.5	33.8	16.2	23.0	24.9	69.6	75.5	116.5
ARR excluding PPC	636.0	468.0	480.9	453.9	250.0	304.6	506.1	414.6	451.8	1596.0	1190.6	1237.3

* Actuals given here are based on the revised estimates given by the petitioners in the ARR petition

SOURCE Tariff orders issued by DERC for various years

The movement in the ARR (proposed, approved and actual) over the years is presented in Figure 4.13.

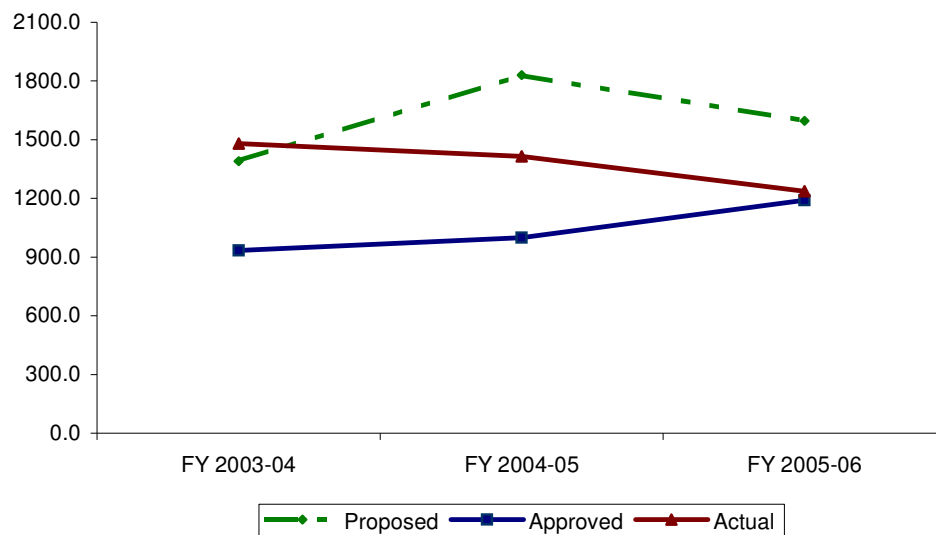


Figure 4.13 Movement in ARR (proposed, approved and actual) over the years

SOURCE Tariff orders issued by DERC for various years

Tariff rebalancing

Tariff rationalization

The Commission in its tariff order for FY 2003-04 stated that while it is important to remove the cross subsidy in the tariff structure, it is more important at this stage to lay emphasis on matters related to rationalization of tariff. It further elaborated that removal of cross-subsidies can only be a sequel to rationalization since it would be difficult to undertake removal of cross subsidy along with rationalisation as it would have a negative impact on the revenue. Accordingly, Commission took several measures like abolition of minimum charges and also meter rent, removal of misuse charges on account of MCD license, abolition of the normative consumption concept, imposition of demand violation surcharge on excess demand only, merging of categories and reduction in slabs to simplify the tariff structure etc. The Commission was of the view that monetary relief that consumers particularly industries will get by such measures will negate the impact of increase in tariffs. It further stated that it would consider reduction in cross subsidy in the next order when impact of rationalization measures shall be evident.

In tariff order for FY 2005-06, the Commission again highlighted the need for removal of cross subsidy. It however, highlighted that while it is important to remove cross subsidy, it is important to keep in mind the historical perspective for the need to continue with cross-subsidy for some time. It was pointed out that the worst hit is the domestic category with respect to the quality of supply. This category is the most affected by the improper distribution network and metering and billing complaints are also substantially higher in this category. The Commission in view of the above stated that it would attempt to reduce the cross-subsidy by moving domestic tariffs towards cost of supply once efficient operation levels are reached, quality of supply has improved and metering and billing problems are minimized.

In FY 2005-06, the Commission attempted to reduce the cross subsidy in the tariff structure by increasing the tariffs for subsidized categories to a greater extent however, as already discussed there was a subsequent rollback of tariffs for the domestic and agricultural consumers.

New initiatives in tariff design

Measures taken by DERC in tariff design over the last three years are summarized below:

FY 2003-04

- Abolition of minimum charges and meter rent in the domestic category and removed life-line category
- Introduction of two-part tariff with fixed and energy charge
- Meter rent and minimum charges were abolished for all major consumer categories
- Merger of the sub-categories, in Small Industry Power Category viz. non continuous industry and continuous industry
- Rent for agricultural category was also abolished and fixed charges were introduced for agricultural consumer also

FY 2004-05

- Merger of first two slabs of 0-100 units and 100 to 200 units to create a single slab of 0—200 units

FY 2005-06

- In FY 2005-06, the Commission extended kVAh billing to the Non-Domestic low tension category for consumers with sanctioned load above 10 kW

In the order for FY 2003-04, the Commission had directed the petitioner to prepare a base paper on ToD metering and submit the same to the Commission. It was of the view that introduction of ToD Tariff is essential to flatten the load curve, as it will encourage off-peak hour consumption.

In tariff order for FY 2004-05, the Commission expressed its intent to introduce ToD tariffs for LIP (Large Industrial Power) and MLHT (Mixed load high tension) categories to begin with, where ToD meters have already been installed. The DISCOMs in compliance to the direction issued by the Commission had submitted a Base Paper on ToD metering to the Commission. The Commission however expressed that before introducing the TOD tariff; the Commission would like to critically examine the following aspects:

- Practical problems in implementing TOD tariffs
- Consumption Pattern
- Benefit to the system in terms of flattening of load curve
- Assessment of Revenue Impact and Billing Impact
- Time slots of hours for which differential tariff is to be given
- Tariff differential for these slots

As the detailed analysis is required to be carried out on above aspects, which also requires additional data from the licensees,

the Commission decided to take up this matter separately after the issuance of this Order.

As of now time of day tariffs are not operational in Delhi.

Implementation of multi-year tariff framework

The Commission has framed the draft multi-year tariff regulations for generation, transmission and distribution and has also circulated a consultative paper on multi-year tariff in October 2006 seeking comments from various stakeholders. TERI had submitted comments on the consultative paper and subsequently presented the same during the public hearing held on 27th November 2007. The comments have been reproduced in Annexure 4.1.

The regulations state that distribution licensee shall segregate the accounts of the licensed business into wheeling business and retail supply business. The ARR for the wheeling business would be used to determine wheeling charges and the ARR for the retail supply business to determine retail supply tariffs.

During the discussions held with DERC officials on 1st December 2006, it was highlighted that the next ARR petition will be based on a multi-year tariff framework. The duration of the first control period would be 4-years starting 1st April 2007.

Category-wise tariff

Table 4.36 shows the average realization from tariffs for FY 2003-04, FY 2004-05 and FY 2005-06 and the corresponding change during this period. It shows that while there has been considerable increase in the tariffs for non-domestic, industrial and agriculture category, the increase in domestic category has been minimal. One reason for the low increase in the domestic tariffs has been the rollback that occurred in FY 2005-06, due to widespread protest by the consumers in Delhi. This is discussed in Box 4.1.

Table 4.36 Category-wise average tariff in FY 2003-04, FY 2004-05 and FY 2005-06

Category	2003-04	2004-05	2005-06	% Change in FY 2004-05 over FY 2003-04	% Change in FY 2005-06 over FY 2004-05
	Rs./kWh	Rs./kWh	Rs./kWh	%	%
Domestic	2.56	2.80	2.80	9.3%	0.0%
Non-Domestic	5.20	6.09	6.12	17.3%	0.5%
Industrial	4.54	5.34	5.38	17.6%	0.9%
Agriculture	0.73	1.54	1.56	109.3%	1.7%
Railway Traction (incl. DMRC)	4.78	2.43	3.15	-49.1%	29.4%
Others	5.85	4.03	5.51	-31.2%	36.9%
Total	3.60	3.97	4.37	10.2%	10.1%

SOURCE Tariff orders issued by DERC for various years

Box4.1: Tariff rollback in FY 2005-06

In FY 2005-06, the DERC announced a tariff increase of 10% for domestic consumers to be implemented in Delhi. Complaints of faulty metering and billing coupled with the hike announced by DERC raised consumers' ire and there were widespread pretexts against the tariff increase. Some consumer organizations and associations urged consumers not to pay the increased tariff. Initially GoNCTD stood firm in the support of tariff hike but later relented and announced that the tariff increase would be rolled back with GoNCTD providing subsidy for 50% of the tariff increase for domestic consumers and 100% for the agriculture consumers. The remaining 50% of the tariff increase for domestic consumers would be covered by the discoms. In their petition to DERC regarding the rollback, the discoms asked that the loss of revenue due to the rollback be adjusted against any against from the over achievement of loss reductions. In response, DERC said that, "...the discoms are given the liberty to raise the issue of the recovery of the incentive in their ARR petition for FY 2006-07, which would be examined by the Commission, on merits, based on the provision of the law". In other words, the 50% rebate may not be provided by the companies but will be paid from the expected additional revenues due to over achievement in AT&C losses that would have otherwise been used to reduce the tariff increase next year. According to DERC, the total value of the rebate provided by GoNCTD to domestic and agriculture consumers was Rs. 180 Cr of which Rs. 91 Cr was provided by GoNCTD and Rs. 89 Cr is being covered by the discoms.

SOURCE Prayas Report titled "A critical review of the performance of Delhi's privatised distribution companies and the regulatory process", May 2006

Cross subsidy

The Commission in the tariff order issued for FY 2004-05 and FY 2005-06 highlighted the importance of a cost of service study to accurately analyse the level of cross-subsidy in the tariff structure. The Commission directed the petitioners in August 2005 to suggest modifications in the prescribed cost of supply formats to capture the data required for computing the same. The petitioners have submitted a base paper on voltage-linked tariffs along with the list of data that would be required for computing the cost of supply for each consumer category.

As per the latest status from the tariff order for FY 2006-07, the petitioners have requested the Commission to convene a technical session on the same. In absence of the relevant information in FY 2004-05 and FY 2005-06, the Commission has continued with average cost of supply as a guiding principle for tariff setting.

Table 4.37 Change in cost-recovery for various consumer categories over the years (approved figures)

Particulars	2003-04			2004-05			2005-06		
	Avg. tariff Rs./kWh	Avg. cost Rs./kWh	Recovery %	Avg. tariff Rs./kWh	Avg. cost Rs./kWh	Recovery %	Avg. tariff Rs./kWh	Avg. cost Rs./kWh	Recovery %
Domestic	2.56	3.45	74%	2.80	3.51	80%	2.80	3.97	71%
Non-Domestic	5.20	3.45	150%	6.09	3.51	173%	6.12	3.97	154%
Industrial	4.54	3.45	131%	5.34	3.51	152%	5.38	3.97	136%
Agriculture	0.73	3.45	21%	1.54	3.51	44%	1.56	3.97	39%
Railway Traction (incl. DMRC)	4.78	3.45	138%	2.43	3.51	69%	3.15	3.97	79%
Others	5.85	3.45	169%	4.03	3.51	115%	5.51	3.97	139%
Total	3.60	3.45	104%¹	3.97	3.51	113%	4.37	3.97	110%

SOURCE TERI estimates

¹ The over recovery from the distribution business is on account of the subsidized bulk supply rate that the discoms pay to Transco.

As seen from the above, domestic and agriculture category are subsidized by industrial, non-domestic and other category with these categories paying a tariff much above the average cost of supply. The above table also highlights that over the two-year period the cost recovery has decreased from consumers under domestic, railways and others and that from consumers under non-domestic and industrial category has increased. This again highlights that there is significant cross subsidy present in the prevailing tariff structure.

Convergence Index (CI)

Figure 4.14 indicates the trend in CI for Delhi from FY 2003-04 to FY 2005-06. As seen, the level of cross-subsidy increased from FY 2003-04 to FY 2004-05. It is only in FY 2005-06 that there has been a reduction in cross subsidy to the extent of 25%. However, in comparison to the FY 2003-04 level, the level of cross subsidy has increased by 15% in FY 2005-06.

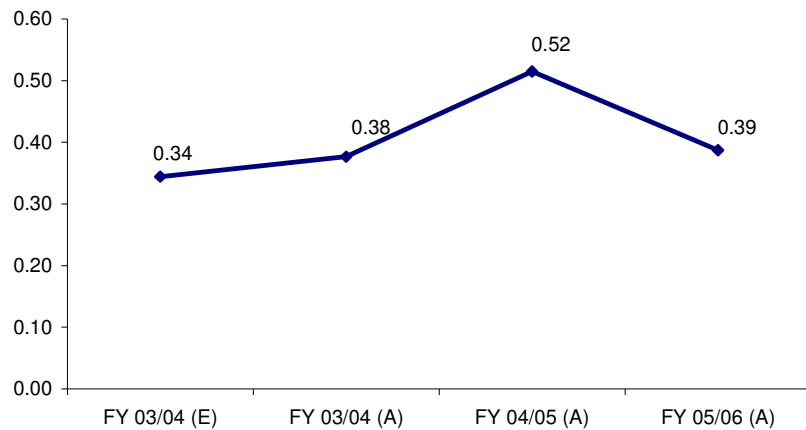


Figure 4.14 Trend in convergence index

SOURCE Tariff orders issued by DERC for various years

Subsidy support by the Government

As stated above, as per the policy directions the retail tariffs for all the three discoms was to be kept same for the reform period. This transitional support was routed through the Transco, which was to subsidize the bulk supply tariff to the discoms depending on the paying capacity of each discoms. Table 4.38 gives the total transitional support provided by GoNCTD and the timely phasing of this subsidy. Over the years, the GoNCTD has disbursed transitional support as committed.

Table 4.38 Transitional support provided by GoNCTD along with its phasing

Year	Transitional support
	Rs. Crore
FY 2002-03	1364
FY 2003-04	1260
FY 2004-05	690
FY 2005-06	138
FY 2006-07	Nil
Total	3452

SOURCE

At the time of privatisation, it was understood that the design of transitional support would be based on a specific tariff hike trajectory developed by the reform consultants (SBI Caps)¹. This involved a tariff hike of 10% for the first three years and 5% and 3% for the remaining two years. The discoms may have bid for the distribution circles keeping in mind this trajectory, which was understood to be followed.

In Delhi, the tariff hike however has not been commensurate to that expected during the design of the transitional support. Table 4.39 shows a comparison of the tariff hike planned and that implemented over the reform period.

Table 4.39 Tariff hike planned vis-à-vis actual hike

	2002-03	2003-04	2004-05	2005-06	2006-07
Planned	10%	10%	10%	5%	3%
Actual	Nil	5.01%	10%	6.6%	0%

SOURCE

The above analysis raises serious concerns on the viability of Transco to be able to support and subsidize the price of power. Further, while the transitional support was form of soft loan, the repayment terms of the same have been left open and there has been no discussion on it till date.

Regulatory Asset

The Commission in its orders on ARR and tariff petitions for FY 2005-06 deliberating all the options of bridging the revenue gap had revised the Regulatory Asset of Rs. 696 Crore to Rs 548 Crore in respect of the discoms. The regulatory asset of the Transco was separately amortised in the Tariff Order of FY 2005-06 in full.

The Commission's philosophy on the creation of Regulatory Asset, the quantum regulatory asset apportioned to Transco and discoms and its amortization been adequately elaborated in the Tariff Order for FY 2004-05 and FY 2005-06. The Commission in its Tariff Order dated 7th July 2005 had amortized the Regulatory Asset of the 3 discoms to the tune of Rs. 205 Crore

¹ Although this did not form part of the policy document notified by the GoNCTD

by their respective overachievement leaving the regulatory asset of Rs. 343 Crore. The balance Regulatory Asset of Rs. 343 Crore was allocated to various Licensees as below:

Table 4.40 Regulatory asset over the years

	BRPL	BYPL	NDPL	Transco	Total
2004-05	267	138	192	100	696
Revised 2005-06	221	120	207	0	548
Amortization in 2005-06 ¹	71	12	122	0	205
Remaining	150	108	85	0	343

SOURCE Tariff orders issued by DERC for various years

Following the above, the Commission has reworked the Regulatory Assets based on the true-up exercise for the FY 2004-05 based on the audited accounts. With the truing-up of the figures for FY 2004-05 in the present order, the Regulatory Asset for FY 2004-05 has been estimated at Rs. 518 Crore. Out of this, Rs. 211 Crore has been amortized on account of overachievement in FY 2004-05 leaving the balance unamortized portion at Rs. 307 Crore. The amount of over-achievement during FY 2004-05 has been revised from Rs. 205 Crore considered by the Commission in its Tariff Order of FY 2005-06 to Rs. 211 Crore in the tariff order for FY 2006-07.

Table 4.41 Amortization of Regulatory Asset in FY 2004-05 - based on second truing up (Rs Crore)

Discom	Revenue gap/(Surplus) Petitioner	Overachievement	Revenue gap/(Surplus) in Rs. Crore - Commission	Revised regulatory asset	Amortization	Balance regulatory asset after adjusting over achievement
BRPL	254	71	215	215	71	144
BYPL	169	12	100	100	12	88
NDPL	274	128	203	203	128	75
Total	697	211	518	518	211	307

SOURCE Tariff orders for FY 2006-07

The revised regulatory asset of Rs.307 Crore has been amortized out of the revenue surplus of discoms for the FY 2005-06 leaving the balance unamortized regulatory asset of Rs. 2 Crore, Rs.79 Crore, and Rs. 15 Crore in case of NDPL, BRPL and BYPL, respectively. The balance unamortized regulatory assets of each of discoms have been adjusted in determination of their paying capacity while working out the bulk supply tariff for the FY

¹ This amortization was on account of revenue accrued due to overachievement of losses by the discoms.

2006-07. Thus, the regulatory asset created by the Commission in the Tariff Order for FY 2004-05 has been fully amortized.

Table 4.42 Amortization of Regulatory Asset in FY 2005-06

Discom	Balance Regulatory Asset (Rs. Crore)	Revenue gap/ (Surplus) in Rs. Crore - Commission	Amortization of revenue surplus (Rs. Crore)	Balance Regulatory Asset (Rs. Crore)	Net revenue gap / (Surplus)
BRPL	75	(73)	73	2	2
BYPL	144	(64)	64	79	79
NDPL	88	(73)	73	15	15
Total	307	(210)	210	96	96

SOURCE Tariff orders for FY 2006-07

Electricity duty

Table 4.43 shows the electricity duty collected by the petitioners over the years. The duty collected is passed on to the Delhi Government.

Table 4.43 Electricity duty collected by the discoms (in Rs. Crore)

	NDPL	BRPL	BYPL	Total
FY 2003-04	61	80	48	189
FY 2004-05	64	87	47	198
FY 2005-06	69	98	51	218

SOURCE Tariff orders issued by DERC for various years

Governance

Subsequent to the unbundling of Delhi Vidyut Board into six successor entities and the issuance of Policy Directions by the Government, the process of submission of tariff proposal by the respective licensees and its approval by the Commission was required to be different from the conventional one.

Conventionally, a utility files the tariff proposal based on the revenue gap between the proposed Annual Revenue Requirement and the revenues at existing tariff of that utility alone. The tariff proposal is given to bridge this revenue gap and is a distribution of various expense items in the ARR on the various categories of consumers.

The Policy Directions require tariffs to be determined such that they are uniform for all consumer categories across all Distribution Companies, which makes the tariffs of the licensees interlinked with each other. Thus, in their petitions the licensees submitted that they are not in a position to file a detailed tariff proposal and prayed to the Commission that their

tariff may be determined as per the provisions of the Act and the Policy Directions.

Under these circumstances, the Commission made the petitions public on 7th March 2003 (the first filing post unbundling), clearly indicating the above position. It also made a presentation to select stakeholders on the petitions filed by Discoms and Transco and requested the stakeholders to suggest measures for rationalization of tariff. In the tariff order for July 2002 to March 2003 and FY 2003-04, the Commission has explained fundamental concepts of tariff determination under the framework of Policy Directions in details, so as make the inter linkages between the tariffs of all licensees more clear and better appreciated. These principles have been followed thereafter in the tariff order for each year.

Timeliness of tariff orders

In FY 2003-04, the discoms filed the petition for nine months of FY 2002-03 in November 2002 (BRPL), December 2002 (NDPL) and January 2003 (BYPL). The petitioner did not propose any retail tariff and requested the Commission to determine the same taking into account the provisions of the Transfer Scheme, the Policy Direction issued by the Government and filings made by them. However, during a meeting held with senior officials of the four companies (including Transco), the Commission directed the distribution companies to submit a consolidated petition for FY 2002-03 (nine months) and FY 2003-04. This was essentially meant to facilitate easy reference, internal consistency and to avoid multiplicity of documents. Accordingly, the discoms filed a joint petition for the two years.

In FY 2004-05 and FY 2005-06, as per the directions of the Commission the discoms have filed their respective petitions after coordinating the same with the Transco. This was mainly because as per the policy directions the retail tariffs for all discoms was to be kept same and the transition support during the reform period (2002-03 to 2006-07) was routed through Transco. The quantum of this support was based on the paying capacity of each Discom. Table 4.44 highlight the timeliness of tariff order issued by DERC over the years.

Table 4.44 Timeliness of tariff order issued by DERC

Year	Date of filing of petition	Date of acceptance of petition	Date of Issuance of Order	Days from filing to acceptance	Days from acceptance to issuance
2003-04	BRPL 06-Mar-03	06-Mar-03	26-Jun-03	0	112
	BYPL 06-Mar-03	06-Mar-03	26-Jun-03	0	112
	NDPL 04-Mar-03	04-Mar-03	26-Jun-03	2	114
2004-05	BRPL 26-Dec-03	16-Jan-04	09-Jun-04	21	145
	BYPL 26-Dec-03	16-Jan-04	09-Jun-04	21	145
	NDPL 17-Dec-03	16-Jan-04	09-Jun-04	30	145
2005-06	BRPL 29-Dec-04	10-Mar-05	07-Jul-05	71	119
	BYPL 29-Dec-04	10-Mar-05	07-Jul-05	71	119
	NDPL 31-Dec-04	10-Mar-05	07-Jul-05	69	119

SOURCE Tariff orders issued by DERC for various years

The EA 03 mandates that the Commission must issue the tariff order within 120 days of the acceptance of the petition. DERC except in FY 2004-05 DERC has issued the orders on time.

Public participation

In order to undertake public consultation and solicit views of various stakeholders on the petition filed by the discoms, the Commission after the acceptance of petition approves a public notice published in English, Hindi and Urdu dailies highlighting the salient features of the petition and inviting their comments and suggestions.

In addition, the copies of the petition are made available to the public at a reasonable rate at the respective companies head-offices and the documents are posted on the website of the Commission. Further, the Commission issued a public notice requesting public response on the issues related to tariff rationalization.

Post admission of the petition, the Commission also held technical sessions with the concerned staff of the petitioner to seek additional information and clarifications. The Commission also visited the petitioner's area at some select locations to review the physical progress of the Capital Works and Repair and Maintenance Works.

Table 4.45 highlights the level of public participation in the hearings and time given to stakeholders for filing the objections.

Table 4.45 Level of public participation

Year	Time given for filing comments /objections in days	No. Of written objections
2003-04	40*	78
2004-05	31	78
2005-06	31	98

* In FY 2003-04, an extension of 9 days was granted for filing the objections

SOURCE Tariff orders issued by DERC for various years

The objections have been on wide ranging topics including procedural issues, quality of filings, power purchase, AT&C losses, depreciation etc with a good mix of objectors from industry, Resident Welfare Associations (RWAs), Government and other institutions.

An important point that is worth reiterating here is power of domestic consumers particularly the RWAs in Delhi. Through widespread agitation and ire expressed by them they were able to affect rollback in tariffs in FY 2005-06 and also exert significant pressure on the Government to continue the subsidy support that was given in FY 2005-06 to maintain the tariffs at same level.

Staffing

DERC has been adequately staffed as the Delhi Government sanctioned requisite number of staff to it during its inception. Most of the officials are on deputation from other agencies and hence their stay at DERC is limited. Thus, the Commission faces a problem of retaining the knowledge and expertise, once these staff returns back to their parent organisation. In addition, the Commission is of the view that overtime the magnitude of work has expanded so much that there should be additional staff to undertake specialized work.

Status of directives issued by DERC

In the tariff order for FY 2005-06, the Commission has issued a number of directives to the utilities with the objective of obtaining operational efficiency and streamlining the flow of information. Table 4.46 gives the status of compliance of important directives (new directives) given by the Commission to the utilities in the tariff order for FY 2005-06.

Table 4.46 Compliance status of directives given by DERC

Directive ¹	Response
<p>AT&C losses – The Commission had directed the petitioners to provide the break up of energy input, energy sold, energy billed, revenue realisation against billed energy and district-wise AT&C losses on a monthly basis within 15 days after the end of the month</p>	<p>All the discoms have submitted the information. There was a slight delay in submission of the information on which the Commission has directed the utilities that it should be avoided in future.</p>
<p>Payment through cheques – The Commission had directed that in case of bill of more than Rs. 4000/-, payment shall be accepted only through Account payee cheque/DD. Commission also directed that all other consumer with bills less than Rs. 4000/- should also be encouraged to pay cheque / DD.</p>	<p>The Petitioners submitted that the message for information to the consumers is carried out on the bills. STQC Directorate of the Ministry of Information Technology after conducting an audit of Billing Software of the petitioner has mentioned in its findings that the software of the petitioner did not have any validation of accepting payment for more than Rs.4000/- by cash. The Commission has therefore directed that suitable changes be made in the software to have this validation and report the compliance within one month of the issue of this order.</p>
<p>Energy audit of employees of the erstwhile DVB - The Commission had directed the petitioners to conduct energy audit in case of those employees of the erstwhile DVB whose average consumption pattern is too low as compared to the average level of consumption for domestic consumers and submit the report within three months from the date of issue of the order.</p>	<p>While both BRPL and BYPL are yet to submit the report after proper investigation, NDPL has already submitted the same. The loss levels in the NDPL housing colonies were found to be much lower than the company average.</p>
<p>Special Voluntary Retirement Scheme - The Commission had directed the petitioners to incorporate the details of actual date of super annuation of employees who opted for SVRS in the estimated savings from SVRS and submit the same to the Commission.</p>	<p>The details along with the estimated savings were furnished by the petitioners in the ARR petition.</p>
<p>Capital Investment - The Commission had directed the petitioners to submit the complete DPR along with cost-benefit analysis for Schemes more than Rs 2 Crore for obtaining the Scheme wise investment approval from the Commission as per the terms and conditions of the license for Distribution and Retail Supply of Electricity with in a month from the date of issue of the Order</p>	<p>The Quarterly progress reports on implementation of capital schemes have been submitted.</p>

¹ Most of the directives are common to all utilities. However, where it is applicable to any specific utility it has been separately indicated.

Directive'	Response
<p>Cost Audit – The Govt. of India has prescribed Cost Accounting Record (Electricity industry) Rules 2001 under which electricity utilities are required to maintain records to show their costs and other details. The Commission had directed that the Licensees comply with this rule and separate accounts be maintained and submitted to the Commission since the introduction of this Rule.</p>	<p>BRPL and BYPL have confirmed that proper cost records as prescribed by the Central Government under section 209(1)(d) of the Companies Act, 1956 are maintained by them. The Commission has asked them to submit the same.</p> <p>NDPL has submitted that it is in process of preparing the same and shall submit once it is complete.</p>
<p>Asset capitalisation (NDPL)– The petitioner was directed to submit the complete details of assets capitalized during the year</p>	<p>NDPL has complied with the Directive</p>
<p>Oil cooled transformers – The Commission had directed the petitioners to provide the details of oil filled oil cooled transformers installed by them in residential/commercial buildings.</p>	<p>NDPL has submitted the list as per the Commission's requirement.</p> <p>Both, BRPL and BYPL had also submitted a list of oil-filled, oil-cooled transformers in use in residential / commercial premises including CGHS. However, there were certain he discrepancies in the list which have been indicated to the petitioner and the petitioner has been advised to get the survey of the complete area falling under their jurisdiction and submit a fresh list which is yet to be received in the Commission.</p>
<p>Sale/retirement of assets - The Commission had directed the petitioners to file a separate petition to the Commission within one month of the issue of the Order providing the details of the assets that are to be retired. The petition was to include complete details with respect to each asset retired/proposed to be retired.</p>	<p>NDPL has submitted a separate petition providing the details of assets retired in FY 2002-03, FY 2003-04 and FY 2004-05.</p> <p>Both BRPL and BYPL had submitted a letter containing details of sale/ retirement of assets. The Commission has asked them to file a petition providing the details of retirement of assets along with clarifications.</p>
<p>Separation of corporate offices and employees common to BRPL and BYPL within three months from the date of issue of the order.</p>	<p>The petitioners have complied with the directive and submitted the details to the Commission</p>
<p>In addition the Commission had also directed BRPL and BYPL to ring fence accounts and stores licensee wise within three months and report the compliance of the same to it. Further, it was also to separate within three months A&G expenses that is currently common to these Discoms. BYPL was to shift its office in BYPL area to mitigate the problems faced by the Commission. Prior approval of any increase in the A&G expenses was to be taken.</p>	

Directive ¹	Response
<p>Installation of meters capable of recording kVAh consumption- In case where the meters capable of recording kVAh consumption have not been installed for NDLT and SIP consumers with sanctioned load above 10 kW, the Commission had directed the Petitioner to install the meters capable of recording kVAh consumption within 60 days from the date of issue of the Order and report the compliance to the Commission.</p>	<p>The Petitioner has submitted that program of installation of meters has been taken up in right earnest. The job has been completed except in some cases where either the premises were not accessible or in those cases where there has been a resistance from consumers, slowing down the replacement program.</p>
<p>Depreciation (NDPL) – The Commission had directed the petitioner to provide pro-rata depreciation considering actual usage / operation (in number of days) of asset during the financial year.</p>	<p>NDPL has submitted that the computation of depreciation fro FY 2004-05, as provided in the audited accounts of the company and reflected in the relevant formats of the petition, is based on the actual usage / operation of assets. The depreciation for FY 2005-06 and estimates for FY 2006-07 have been computed on pro-rata basis with the assumption that the capitalization of various assets would happen through-out the year at regular intervals, thus resulting in an effective depreciation for 6 months.</p>

SOURCE Tariff orders issued by DERC for various years

Regulatory Initiatives

Implementation of RIMS (Regulatory Information Management System)¹

DERC have introduced a comprehensive Regulatory Information Management System (RIMS) that has been functional since last 11 months. The process for setting up RIMS started in March 2003, with the following objectives in mind: -

- To validate and consolidate data submitted by the licensees
- Analyse and review the submissions by the licensees
- To assist in determination of tariff by providing reports displaying trend analysis and comparisons of various parameters

The development of RIMS was divided into three stages: -

- Phase I – Development of Software Requirement Specification (SRS) and implementation of RIMS
- Phase II – Vendor evaluation and selection for development of application
- Phase III – Implementation Management which involved actual application development based on SRS and technical guidance for selection of hardware and software

Key features of RIMS include performa based validation and upload of ARR files, web based online data entry forms (monthly/annual submission of compliance data), workflow based approval process, integrated e-mail notification and

¹ Source: Provided by DERC officials during visit of TERI team to DERC Office on 1st December 2006

reminders, role based access and security, report generation highlighting summary reports, comparisons across licensees, data trend over period etc.

The system specifies a set format in which the utilities are required to submit/file their information with the Commission. Licensees are able to submit this information online and have the flexibility to upload revised drafts of the same document. Currently, DERC is in close interaction with licensees to further improve upon the system and to make the formats conducive to multi-year tariff framework once it is implemented in Delhi.

Institutionalising RIMS is a good initiative taken by DERC to remove information asymmetry and develop an information repository, problems that most of the regulators have been facing. This should be carried forward and relevant information should be made available to the public through the DERC website.

Consumer advocacy and redressal mechanism

The DERC notified the guidelines for establishment of forum for redressal of grievances of the consumers and Ombudsman Regulations 2003 on 10th June 2003. In accordance with these regulations NDPL has set up CGRFs in Vasant Vihar and Model town¹ and BSES in Karkardooma and Pushpa Vihar ². These CGRFs became operational in August 2005 and are primarily responsible for handling metering and billing complaints. Till date they have disposed approximately 3200 complaints. Further, in order to coordinate the activities of CGRF's, within DERC there are grievance redressal officers that liaison between the consumers and the utility. They are responsible for forwarding the complaints received from consumer to respective utility.

In addition, as per the provisions of the Act, an Electricity Ombudsman has also been constituted in August 2004³.

Cases and appeals

The Appellate Tribunal has so far issued orders on the following cases with respect to DERC.

1. Appeals filed by the petitioners i.e. BRPL, BYPL and NDPL, on the method used for calculation of depreciation, Return on Equity, Deferred Tax etc. The Petitioner's contention was to allow depreciation as per the rates prescribed in 1994 Notification issued by the Ministry of Power. The Appellate Tribunal for Electricity in its order dated 24th May 2006 has

¹ <http://delhigovt.nic.in/rti/appellate>

² http://www.bsesdelhi.com/ENG/Aboutus/in_undertaken.asp

³ The Hindu, Jan 2005, 'Ombudsman holds discom guilty, order refund'

upheld the methodology adopted by the Commission in all the issues raised by the Petitioner except that of depreciation. With regard to the issue of depreciation, the Appellate Tribunal answered in favour of appellant in each of the appeal and the ordered that the Regulatory Commission shall grant consequential relief on actuals.

Meanwhile, the Commission has preferred an Appeal before the Supreme Court of India in Civil Appeal No. 2733 of 2006. The Supreme Court in its Order of 23rd August 2006 directed that the Appellate Tribunal for Electricity to consider the conclusion of the Commission, as if they were good and sufficient for the purpose of making the departure from the Schedule (VI) rates. The Supreme Court highlighted that the basic issue involved in this appeal is whether the Appellate Tribunal was justified in its view that the Commission had not indicated any reason for deviating from (VI) Schedule rates. Without expressing any final opinion, it directed the Tribunal to examine whether the conclusions of the Commission are supportable in facts and in law. It further stated that the Appellate Tribunal should decide the matter after taking into consideration all contentions raised or to be raised by the parties. It however made clear that no interim protection for any period other than the period to which the present appeal relates has been given. The determination made by the Appellate Authority shall be indicated to the parties. The matter shall be placed for further hearing after a period of 6 weeks.

This case has been heard in the Appellate Tribunal for Electricity, which has reiterated its stand made in the order issued on 24th May 2006. The matter has therefore been referred back to the Supreme Court of India and is pending to be heard in January 2007¹.

2. Appeals filed by petitioners i.e. BRPL, BYPL and NDPL, on several issues. Contentions put forward by the appellants were, a) that DERC has neither the jurisdiction nor the authority to direct the appellant to create regulatory asset, as has been order in tariff order for FY 2004-05 and affirmed in the subsequent review order, b) direction to create regulatory asset has resulted in denial of 16% return on equity and recovery of operational expenses, c) bulk supply tariffs has been fixed without reference to the paying capacity of the discoms.

The relevant clauses of the decision by the Appellate are reproduced below: -

¹ As discussed with the officials of DERC

- (i) The Policy Directions issued by the NCT of Delhi has been contravened by the DERC in issuing directions to create Regulatory Assets while approving ARR and determining the tariff for the year in question
- (ii) We hold that the Regulatory Commission has acted illegally in directing the discoms to create Regulatory Asset and so long as there is no Statutory Provision or Statutory Regulation, the Commission will have no authority to direct the DISCOM to create Regulatory Asset and even if there is a Regulation, such a direction shall be an exception
- (iii) We hold that the directions issued to create Regulatory asset has resulted in deferring of 16% ROE as well as recovery of operational cost assured in the scheme and the Regulatory Commission has exceeded in its jurisdiction in issuing such direction resulting in deprivation of the operation cost of all the three DISCOMs during the tariff period
- (iv) We hold that the Regulatory Commission has fixed the Bulk Supply Tariff without reference to the paying capacity of the DISCOMs. This is in contravention of Policy Directions as well as earlier Bulk Supply Tariff order. However, no consequences flow from this in view of the subsequent developments and passage of time and we are not persuaded to interfere with the tariff order on that score
- (v) We allow all the three appeals to the limited extent and direct the Regulatory Commission to allow 9% interest, as it has already allowed by Commission in Chapter 3.11.1 of its Tariff Order, for deprivation of the amounts which were ordered to be created and retained as a Regulatory Asset from the date of Tariff Order and till it is amortised and to reimburse all expenses and incidental charges incurred in this behalf by the DISCOM
- (vi) Since the entire Regulatory Asset created by the DISCOMs already been amortised, only a limited relief is granted in favour of appellant
- (vii) We make it clear that in other respects we are not interfering with the tariff order already passed by the Commission in view of the passage of time and in view of the subsequent developments

The decision was pronounced in open court on 21st July 2006.

Directives issued by GoNCTD

In exercise of the powers conferred by section 12 and other applicable provisions of the Delhi Electricity Reform Act, 2000

(Delhi Act No. 2 of 2001), and after considering the views expressed by the DERC, the GoNCTD had notified policy directions to enable restructuring of the DVB and privatisation of the distribution business. These guidelines were issued on 22nd November 2001.

In addition to the policy directive given by GoNCTD at the time of privatization of the erstwhile Delhi Vidyut Board and on which the entire reform model has been based, there has been no directive given by the GoNCTD to the Commission.

Applications for availing open access

The Commission has notified the terms and conditions for open access on 3rd January 2006. As per the regulations, phasing of open access for consumers shall be based on the following schedule.

Table 4.47 Phasing schedule for open access

<i>S. No.</i>	<i>Particulars</i>	<i>Date of introduction</i>
1	Delivery of electricity for use by consumers with connected load of 5 MW and above	1 st July 2007
2	Delivery of electricity for use by consumers with connected load of 3 MW and above	1 st January 2008
3	Delivery of electricity for use by consumers with connected load of 1 MW and above	1 st July 2008

SOURCE DERC Website

Presently, there is no open access taking place in Delhi and no applications till date have been received by the Regulator.

Status of annual accounts

The utilities have been submitting most of the information desired by the Commission on time. The annual accounts are submitted to the Commission along with the ARR petition of each year and are up to date.

Other studies on power sector reforms in Delhi

Some of the important points raised by other studies on power sector reforms in Delhi are presented below:

Prayas report¹

- No real competition in privatisation of Delhi – In case of Delhi, although half a dozen companies showed an initial interest in the process, at the final stage only two bidders submitted the bids. Furthermore, these two parties' bids for loss reduction were lower than the Government stipulated minimum. In addition, loss reduction

¹ A critical review of the performance of Delhi's Privatised Distribution Companies and the Regulatory Process – Prayas Occasional Report (January 2006)

trajectory projected by the bidders was quite similar. All these factors indicate that there was no real competition in the privatisation of Delhi discoms.

- Reduction in AT&C losses by the privatised discoms has been one significant achievement. Loss reductions that have already been made over the three years since privatisation have resulted in savings of about Rs. 880 Crore for Delhi consumers.
- As a result of financial reengineering and significant AT&C loss reduction, discoms have made considerable progress in terms of achieving financial self-sufficiency and ability to pay full costs. But in the coming years aggressive AT&C loss reduction will still be required to meet the goal of discoms financial self –sufficiency. This is because, unlike the first three years of the transition period, in coming years, the cost of power purchase is likely to increase. Coupled with the start of repayment of the HoldCo loan by discoms and a progressive increase in discoms costs is likely to necessitate continued tariff increases. Future tariff increases could be moderated if there is significant reduction in losses or if GoNCTD decides to provide further subsidy. But in that case, one of the basic goals of restructuring and privatisation – financial self-sufficiency –will not have been achieved.
- Shortcoming in regulatory oversight - Though DERC took positive steps on many issues; there were shortcomings in the regulatory oversight. For example, discrepancies in the consumption patterns and billing rates, lack of adequate and timely attention to quality of service issues etc. Some of the lessons that the report pointed out were:
 - Use of AT&C losses as a measure of efficiency is not fool-proof
 - Need for validation of metering, billing and collection systems
 - Need to ensure that efficiency gains are not eroded by increasing costs
 - Need for stringent monitoring of capital expenditure and quality of service
 - Need to strengthen regulatory process to meet the challenges of restructured sector

Regulations notified by DERC

DERC has either notified or issued draft of the following regulations.

Table 4.48 Regulations notified by the Commission

Regulations	Date
DERC (Performance Standard - Metering and Billing) Regulations, 2002	19 th August 2002
DERC Comprehensive (Conduct of Business) Regulations, 2001	9 th March 2001
DERC (Management and Development of Human Resources) Regulations 2001	16 th April 2001
DERC (Delegation of Financial Powers) Regulations	6 th August 2001
DERC (Appointment of Consultants) Regulations 2001	6 th August 2001
Human Resource Development Regulations (Amendment)	26 th May 2003
DERC (Guidelines for establishment of Forum for redressal of grievances of the consumers and Ombudsman) Regulations 2003	11 th March 2004
DERC (Procedure for filing Appeal before the Appellate Authority) Regulations, 2005	28 th November 2005
DERC (Treatment of Income from Other Business of Transmission Licensee and Distribution Licensee) Regulations, 2005	28 th November 2005
DERC (Terms and Conditions for Open Access) Regulations, 2005	3 rd January 2006
DERC (Intra-State Electricity Trader) Regulations, 2005	23 rd January 2006
DERC (Medical Attendance) Regulations, 2003	21 st April 2002
DERC (Grant of Consent for Captive Power Plants) Regulations, 2002	12 th March 2003
Draft Multi-year tariff regulations for generation, transmission and distribution	October 2006

SOURCE DERC Website

Power sector ratings

As per the performance rating of the state power sector carried out at the instance of the Ministry of Power, GoI, Delhi has been given the following ratings during FY 2003-04, FY 2004-05 and FY 2005-06.

Table 4.49 Power sector ratings for Delhi

	FY 2003-04	FY 2004-05	FY 2005-06
Rank	1	3	3
Score	57.00	51.91	50.87

In the context of performance of the power sector in Delhi, the ranking report highlighted the following strengths and weaknesses:

Strengths

- Power sector in the state restructured and unbundled; distribution utilities privatised
- All distribution companies recovering all operational expenditure without any direct state government subsidies
- Strong financial position of the state government with consistent revenue surpluses
- High level of IT adoption by the distribution companies (Discoms) in consumer services such as metering, billing, complaint handling, etc.
- Manpower at distribution level reduced with introduction of Voluntary Separation Scheme

Weaknesses

- High level of systemic losses with Transco having accumulated losses of Rs. 37.78 billion, leading to a negative networth
- High aggregate technical and commercial losses (AT&C losses)
- Generating companies operating at low levels of plant load factor, being 65 per cent in 2004-05

Conclusions

- Reforms were initiated in Delhi in 2002 with the issuance of policy direction by the GoNCTD and privatisation of distribution business
- Generation, transmission and distribution have been unbundled
- Significant progress has been made in terms of AT&C loss reduction, which formed the basis of privatising the distribution business. All the discoms have overachieved the loss reduction targets set for them
- Own generation within Delhi is considerably low with problems like ageing plants, fuel shortage etc leading to low utilization
- Peak and energy shortage still continue. The problem becomes severe during summers when peak load reach its highest level
- The sector as of now is sustained by subsidy provided by the Government during the transition period. The subsidy is routed through the Transco, which subsidizes the bulk supply price. Repayment of the support provided by the Government has been left open ended and has not been discussed till date

- Consumers groups such as Resident Welfare Associations have been very active in Delhi. Protests against the tariff hike in FY 2005-06 led to rollback of tariffs with Government and discoms sharing the loss of revenue
- All the discoms have adopted a number of measures to strengthen consumer interface such as billing, metering, complaints etc and have extensively used new IT initiatives
- On the whole, there has been a marked overall improvement in electricity distribution since privatisation

Annexure 4.1 TERI comments on MYT consultative paper circulated by DERC

2.127 Control Period - The Commission is in favour of staggering the control period for distribution, transmission and generation businesses in Delhi ensuring a more focused and segregated review for each business at the end of the control period.

TERI's view

Control period in a Multi-year tariff (MYT) framework gives the time frame over which targets/ trajectories for controllable factors may be set and principles for determination of revenue requirement and tariff is to be fixed. It is necessary that the control period should be sufficiently long to allow utilities to make necessary investments and recoup the benefits during the control period. However, the control period should not be too long since this could result in inflexibility and lead to excess profits or losses for the utilities for a long duration before changes can be made to the framework.

The control period should be uniformly set for generation, transmission and distribution. Since the CERC regulations for generators are applicable for the period 2004-2009 and the Tariff Policy also mentions that the initial control period may be of three-year duration, on account of data uncertainty and other practical considerations, the first Control Period for Generation, Transmission and Distribution should be 'three-years'. Thereafter the Commission on performance review of the first control period may decide to retain or extend the duration of the control period for subsequent MYT orders.

2.128 Segregation of distribution loss across voltage levels

TERI's view

It is definitely beneficial to monitor distribution loss levels voltage wise so that licensee concerns on losses are addressed. However at this stage, before providing licensees incentive to focus on loss reduction efforts, it is imperative to establish metering at all voltage levels in order to monitor losses at these levels and also across various categories of consumers. Once metering is established across all voltage levels, distribution loss levels may be monitored voltage wise and incentives may be provided to licensees on loss reduction efforts.

2.129 *What should be the level of bad debts?***TERI's view**

Bad debts are due to inefficiency in operation of Distribution Licensees. Variations in bad debts are attributable to being controllable factor. The similar treatment that is accorded to any controllable factor should also be application in the case of bad debts. For instance, a target may be set for the collection of receivables and that provision may be made to write off bad debts. Further, the definition of bad debts would need to be appropriately formulated by the Commission to prevent immediate shocks to the financials of existing licensees.

2.131 *Should there be Provision for Advance against Depreciation?***TERI's view**

It is not necessary to provide for advance against depreciation in tariff calculations and as rightly indicated in the Tariff Policy, the rates of depreciation notified by the commission would be applicable for the purpose of tariffs as well as accounting.

6.18 *What should be the broad approach to setting quality improvement targets?***TERI's view**

Benchmarking with the best Delhi licensee will not promote competition, as there will be no incentive for the best Delhi licensee to further improve its performance. Similarly setting different targets for different licensees is not a competition inductive measure. Benchmarking with international distribution licensees may not be relevant for Indian distribution licensees. Hence a better approach for setting quality improvement targets would be to benchmark with the best India licensee.

6.19 *What should be the broad approach to setting incentives/ penalties?***TERI's view**

Incentive/ penalty mechanisms are an important element of MYT framework. Incentive mechanisms are required to encourage utilities to benefit from superior performance and penalty mechanisms ensure that utilities do not pass their loss burden to the end consumers. The Commission may also investigate the mechanism of sharing of profits (or

losses) between the consumer and utility in order to mitigate the risk of excess profits or losses, as an approach to setting incentives/ penalties. A critical aspect in this regard would be the determination of the specific proportion of profit sharing that is to be adopted. For instance, a 60:40 profit sharing between utilities and customers could be adopted for favourable performance of the utility and the converse for adverse performance. Beyond a limit of surplus, the proportion could also be changed in favour of customers, or could be equally shared.

7.16 (a) at which stage of the MYT process the Benchmarking exercise should be undertaken?

TERI's view

The Benchmarking exercise should form a part of the MYT setting process. This exercise will help the Commission determine targets for controllable factors. Hence the benchmarking exercise should be undertaken in such a manner that before the Commission issues the MYT order for the first control period, it has the results of the benchmarking exercise. This will enable the Commission set out appropriate benchmarked norms that it would require the utility to follow.

(b) Which 'input' and 'Output' drivers should be chosen for benchmarking?

TERI's view

As mentioned in the Consultation Paper, the 'output elements' that should be chosen for benchmarking are peak demand, area served, quality parameters and distribution losses. The 'input elements' that should be chosen for benchmarking are operating costs and capital costs.

Specific Comments

1.11 Commission has considered the following principles while preparing the Consultation Paper and the Draft Tariff Regulations for the 'first control period'

TERI's view

Does this imply that after the end of the first control period, another set of guidelines/ regulations shall be issued by the Commission? In that case, if the Commission decides to stagger the term of control period for generation, transmission and distribution then it will be difficult for the Commission to issue guidelines for the second control period (and subsequent control periods) separately for

generation after three years, for transmission after five years and for distribution after five years.

1.34 and 1.35 *Correction Factors*

TERI's view

It has been indicated that for the Wheeling Business, all corrections will be conducted at the end of the control period. However, for the Retail Business, it has been mentioned that profit sharing may be done annually. Instead of making a distinction between the Wheeling and Retail Business, it would be useful to mention that no correction will be allowed for the controllable costs except for revisions of actual values, if it has performed better than the targets. And all corrections would be done at the end of the control period. In case of uncontrollable costs, since a correction would be required each year to reconcile the actual vis-à-vis the forecast, the profit sharing mechanism on account of such factors would be annual.

TERI's view

1.39 and 1.40 The Commission would suitably modify the procedures and the methodologies used for the next control period, based on experience of the first control period. The Commission would conduct a comprehensive review sufficiently in advance to avoid gap between two control periods.

TERI's view

It is essential to clearly outline the time period for conducting such a comprehensive review. This review should ideally be undertaken either during the middle of the control period or at the beginning of the last year of the control period, so that there is sufficient time to address the relevant issues before the start of the second control period.

2.4 *Sales Variation in Supply Business*

The Commission has been debating about the treatment of sales variation for the supply business since it would impact the retail supply tariff because of power purchase costs.

TERI's view

Option 2, whereby variations are not allowed on the approved sales forecasts and loss is to be borne in the account of the licensee while gains are to be shared as per the profit sharing formula is a better alternative, as it will encourage licensees to implement energy efficiency/ demand side management measures.

2.6 Treatment of sales forecast as ‘controllable factor’

TERI’s view

The Commission may revisit the option of treating sales forecast as controllable factor and letting the risk/ cost associated with volume variations to be borne by the distribution licensee. The Commission should consider the fact that uncontrollable factors like weather could significantly affect the demand forecasts. Also, treating sales as controllable could reward distribution licensees for providing poor quality supply to subsidized consumer segments.

2.33 In fixing the AT&C targets for the control period, Commission feels that the Delhi Distribution licensees should be benchmarked with existing performance of other urban Distribution Licensees in the country.

TERI’s view

Although this is a better option of fixing the AT&C loss targets, the Commission should be careful in deciding which urban Distribution Licensees to be used as candidates for benchmarking the Delhi Distribution licensees as every distribution licensee has a different historical background associated with it. This is particularly true when it has been indicated that *the loss levels of the urban distribution licensees will be below 10% by 2010-11.*

2.55 O&M Cost Allocation

TERI’s view

The proposal of the Commission to consider a consolidated value for O&M expenses is a forward-looking measure and will indeed provide greater flexibility to the licensee. The best option for allocation of O&M expenses is the *Option 3: separate linkage for each component.* However, although the Commission should finalize the O&M expenses based on the stated formula, it should only consider the aggregate value as controllable.

CHAPTER 5 Jharkhand

Introduction

The Jharkhand State Electricity Regulatory Commission (hereinafter referred to as the JSERC or the Commission) was constituted by the Government of Jharkhand (GoJ) under Section 17 of the Electricity Regulatory Commission Act 1998 (hereinafter referred to as the ERC Act). The Commission became operational on April 24, 2003.

So far, JSERC has issued one tariff order for JSEB (Jharkhand State Electricity Board) for FY 2003-2004, one distribution tariff order for TISCO for FY 2005-06 and two-generation tariff orders for TVNL for FY 2004-05 and FY 2005-06. There was no tariff petition/filing by JSEB for FY 2004-2005 and FY 2005-2006. However, the Board has recently submitted the accounts and the tariff petition for FY 2006-07, to the Commission. For the purpose of this study only the tariff order for JSEB for the FY 2003-04 has been considered.

The Commission in the Tariff order for FY 2003-04 issued a directive to the Board to come up with a new tariff petition for FY 2004-05 on a timely basis. But there was no tariff petition/filing by the Board for the subsequent period. Further, the Commission wrote a letter to the Board on 18th December 2004 asking for the filing of new tariff petition, as the prevailing tariff was quite old. However, there was no response from the Board against this letter. The Commission again on 20th June 2006 wrote a reminder to the Board for filing of the tariff petition for revising the tariff. Again, there was no response from the Board.

Finally, the Commission wrote a letter to the Board on 17th July 2006 for filing of the tariff petition against which the board submitted a Tariff petition for FY 2006-07 on 1st August 2006. However, the Commission rejected this tariff petition citing that the submitted tariff petition for the FY 2006-07 is for bundled entity, which is not permitted under the Electricity Act, 2003. Further, the Commission asked JSEB to resubmit the tariff petition for unbundled licensees as per the Electricity Act, 2003. On 1st September 2006, JSEB resubmitted the tariff petition for FY 2006-07 for the unbundled licensees based on the budgetary estimates. The Commission again rejected this, as it was not accompanied with the audited accounts for the relevant years. The Board later submitted the provisional accounts for FY 2002-03 and FY 2003-04. The Commission maintained on its

end that the tariff petition for FY 2006-07 could not be accepted without the accounts for the relevant year.

Finally, on 29th December 2006, the Board submitted the tariff petition for the FY 2006-07, accompanied with the provisional accounts for the FY 2004-05 and the projected accounts for the FY2005-06. The Commission accepted this tariff petition for FY 2006-07. However, all the accounts submitted by the JSEB are un-audited and uncertified.

Demand supply gap

The power- supply condition in Jharkhand has deteriorated sharply over the years. The deficit in energy requirement increased to 4.2% in FY 2005-2006 as compared to 1.7% in FY 2004-2005. The peak shortage decreased from 12.7% in FY 2003-2004 to 1.7% in FY 2004-2005 and remained at the same level for FY 2005-2006.

Movement in Installed Capacity

Table 5.1 highlights the movement in installed capacity in Jharkhand over the years. As observed from Table 5.1, the installed capacity has remained stagnant over the years with no capacity addition in any of the sector viz. private, state and central over the last 4 years. It was only in FY 2005-06, that an additional capacity of 124 MW was added in the state. The problem of lack of adequate capacity becomes even more pronounced on observing the trends in the energy demand (sales). While the sales have grown at a CAGR of 10.1% from FY 2000-01 to FY 2005-06 (actual), capacity addition has grown only by 2.67%.

Table 5.1 Movement in Installed Capacity

Installed capacity (MW)	FY 2001-02	FY 2002-03	FY 2003-04	FY 2004-05	FY 2005-06
Thermal	1500	1500	1500	1500	1620
Hydro	130	130	130	130	130
Gas	0	0	0	0	0
Others	0	0	0	0.08	4.13
Total	1630	1630	1630	1630	1754
Installed capacity by ownership					
State Sector	1390	1390	1390	1390	1394
Private/Licensee	240	240	240	240	360
Total state & Private sector	1630	1630	1630	1630	1754
Share in Central sector stations	185	185	185	185	262
Total	1815	1815	1815	1815	2017

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

The installed capacity in FY 2005-06 was 1754 MW, comprising of 1620 MW of thermal, 130 MW of hydel and 4 MW through other sources. Of the total capacity approximately 69% is state owned.

FY 2002-03 retrospect

The annual statement of accounts of JSEB for FY 2002-03 shows a net loss of Rs. 82 Crore. As indicated in Table 5.2 the cash operating loss for the FY 2002-03 was Rs 12 Crore.

Table 5.2 Cash operating losses of JSEB in FY 2002-03

Description	Rs Crore
Total Earnings	1554
Expenses	1653
Less capitalised expenses	20
Total expense	1632
Loss	77.8
Prior period Credit/Charge	4.5
Net Loss	82
Depreciation	60
Cash operating losses	12

SOURCE Tariff petition filed by JSEB for FY 2006-07

Consumption and Access

Sales/Demand estimation

In FY 2003-04, JSEB proposed sales of 3164 MU, i.e., an increase of 27.5% over the previous years. It further submitted that this sharp increase was due to the increase in billed consumption as it was undertaking initiatives for the complete metering besides augmenting the transmission and distribution (T&D) network.

In order to estimate the sales for FY 2003-04, the Commission scrutinized the information submitted by the Board and its performance in terms of implementation of metering program and initiatives for reduction of losses. On the basis of its assessment, the Commission approved only a 10% increase in sales and remarked that the progress in the metering program was poor and also the loss levels in the state were extremely high.

Figure 5.1 highlights the trend in the actual sales from FY 2001-02 to FY 2005-06. As seen, there has been a steady growth over the years with sales increasing at a CAGR of 10.1%.

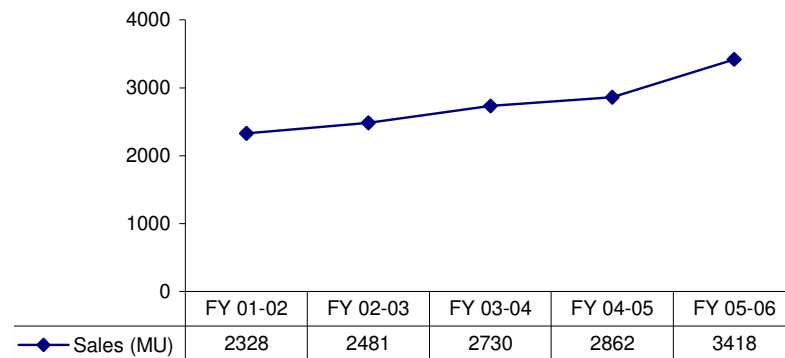


Figure 5.1 Actual Sales in Jharkhand from FY 2001-02 to FY 2005-06

* Sales figure for the FY 2003-04 are the Commission approved figures

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

Category wise sales

Table 5.3 highlights the sales proposed by the petitioner for FY 2003-04 and that approved by the Commission. It also highlights the actual sales reported by JSEB for FY 2003-04, FY 2004-05 and FY 2005-06¹. As FY 2003-04, explained above, the Commission approved a growth rate of 10% across all categories. This growth rate was marginally higher than the growth in sales over the previous year. The Commission, while approving the sales highlighted its constraints in terms of availability of accurate data of sales for various consumer categories. It also directed the Board to estimate circle-wise consumption by different categories including unmetered categories and submit the same to the Commission in the next filing.

Table 5.3 Category wise Sales for FY 2003-04, FY 2004-05, FY 2005-06 and FY 2006-07

Energy sales (MU)	FY 2003-04		FY 2004-05	FY 2005-06	FY 2003-04 to FY 2005-06	
	Proposed	Approved				
		Actuals*	Actuals*	Actuals**	CAGR (%)	
Domestic	669	577	639	777	989	24%
Commercial	172	148	133	140	159	9%
LT Industry	188	163	111	113	116	2%
HT Industry	1608	1387	1190	1318	1485	12%
Railway Traction	429	370	309	383	530	31%
Agriculture	56	48	45	56	59	15%
Public Street Lighting	43	37	42	75	80	38%
Total	3164	2730	2469	2862	3418	18%

*Provisional; **Revised estimate

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07.

Further analysis of the data presented in Table 5.3 indicates that overall sales (actual) increased by a CAGR of 18% (for the period

¹ There was no tariff filing and hence no tariff order for FY 2004-05 and FY 2005-06. The actuals reported by the JSEB are provisional/revised estimates, as per the submitted tariff petition for FY 2006-07.

FY 2003-06) with the highest quantum increase witnessed in domestic category followed by the HT industry.

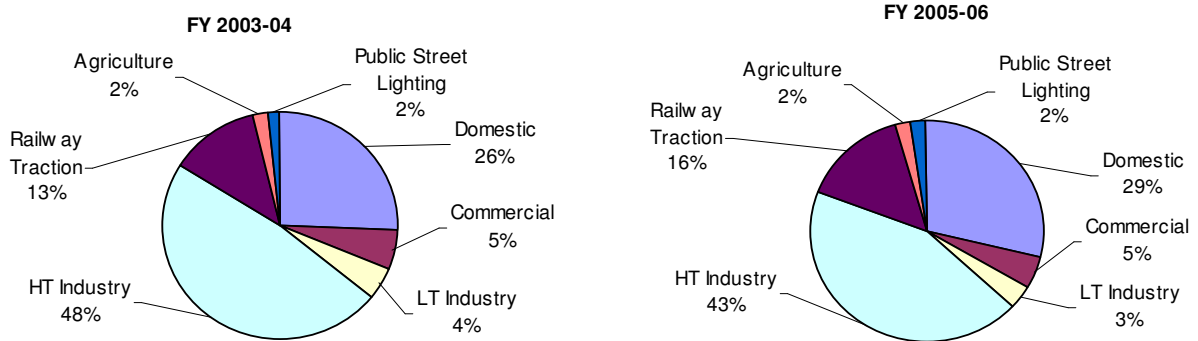


Figure 5.2 Percentage contribution of various categories in the total sales in FY 2003-04 and FY 2005-06
SOURCE Tariff order FY 2003-04 and as reported by JSEB in the Tariff petition for FY 2006-07

Figure 5.2 highlights the percentage contribution of various categories in the total sales in FY 2003-04 and FY 2005-06. As observed, the share of domestic category in the total sales has increased while the share of HT industry that accounts for the highest revenue for JSEB has decreased over the last two-years signifying loss of revenue to the Board.

Number of Consumers and Sanctioned Load

Table 5.4 highlights the number of consumers in the state over the years. As observed the number has increased at a CAGR of 14% over the four-year period. The highest increase has been in case of domestic category followed by commercial.

Table 5.4 Category wise number of consumers (in '000)

Category	FY 2002-03	FY 2003-04	FY 2004-05	FY 2005-06	CAGR FY 2003-06
Domestic-M	335	396	478	555	18%
Domestic-UM	243	264	293	311	9%
Total Domestic	578	660	771	866	14%
Commercial-M	38	43	47	52	11%
Commercial-UM	18	19	20	21	5%
Total Commercial	56	62	67	72	9%
Irrigation -UM	8	8	13	10	9%
LTIS-M	6	7	7	8	8%
HT-M	0.73	.75	0.8	0.9	6%
Railway-M	0.01	0.01	0.01	0.01	6%
Others	0.88	0.9	0.9	0.7	-5%
Total	650	739	860	958	14%

SOURCE Tariff petition filed by JSEB for FY 2006-07

One striking feature of the total consumer mix is the presence of high level of unmetered consumers. As shown in Table 5.5, the

unmetered consumers as a percentage of total consumers in FY 2002-03 were 41%. This percentage has decreased to 36% in FY 2005-06. Across all the consumer categories, the domestic category has the highest percentage of unmetered consumers.

Table 5.5 Un-metered consumers as a percentage of total consumers

Category	FY 2002-03	FY 2003-04	FY 2004-05	FY 2005-06
Domestic-UM	37%	36%	34%	32%
Commercial-UM	3%	3%	2%	2%
Irrigation -UM	1%	1%	2%	1%
Total	41%	39%	38%	36%

SOURCE Tariff petition filed by JSEB for FY 2006-07

From Table 5.5, it is evident that minimal efforts have been made by JSEB in regularizing the unmetered consumers over the years. This also is one of the reasons of high level of losses in the state.

Table 5.6 shows the sanctioned load for various consumer categories over the last two years. As seen, the sanctioned load has increased in almost all the consumer categories.

Table 5.6 Sanctioned load over the years (MW)

Category	FY 2004-05*	FY 2005-06**	% Increase
Domestic	321	410	28%
Commercial	170	222	31%
Irrigation & agriculture	42	50	19%
Low Tension	295	335	14%
High Tension	320	420	31%
Railway Traction	117	117	0%
Others	19	25	32%
Total	1265	1554	23%

*Provisional; **Revised estimate

SOURCE Tariff petition filed by JSEB for FY 2006-07

Observations

Table 5.7 shows the sales and revenue contribution for various years for FY 2005-06.

Table 5.7 Sales and revenue contribution for various years for FY 2005-06

Category	No. Of consumers*	% Of total consumers	Consumption** (MU)	% Of total consumption	Revenue** (Rs Crore)	% Of total revenue
Domestic	866	90%	989	29%	123	11%
Commercial	72	8%	159	5%	58	5%
LT Industry	8	1%	116	3%	71	6%
HT Industry	1	0%	1485	43%	597	54%
Traction	0	0%	530	16%	247	22%
Agricultural	10	1%	59	2%	7	1%
Public lighting	1	0%	80	2%	8	1%
Total	958	100%	3418	100%	1111	100%

* As on 31st March 2006

** Revised estimates as reported by JSEB in the tariff petition for FY 2006-07

SOURCE Tariff petition filed by JSEB for FY 2006-07

As seen from the above, while domestic category contributes 90% in the total consumer mix and 29% towards the total sales, it contributes only 11% in terms of revenue. On the other hand, industrial consumers that contribute only 1% in terms of number and 46% towards total sales contribute 60% of the revenue through tariffs.

Table 5.8 shows the change in consumption per consumer over the years. As seen the overall consumption per consumer has increased by 7.2% in FY 2005-06. This is also accompanied by a 23 % increase in overall sanctioned load per consumer. Except for the Low Tension category, all the other categories experienced an increase in the consumption per consumer in FY 2005-06 indicating an improvement.

Table 5.8 Consumption per consumer for FY 2004-05 and FY 2005-06

Category	No. of Consumers (In '000)	FY 2004-05*		No. of Consumers (In '000)	FY 2005-06**	
		Consumption (MU)	Consumption per consumer		Consumption (MU)	Consumption per consumer
Domestic	771	777	1008	866	989	1142
Commercial	67	140	2093	72	159	2197
Irrigation & agriculture	13	56	4251	10	59	5939
Low Tension	7	113	16642	8	116	14515
High Tension	1	1318	1651629	1	1485	1689420
Railway Traction	0	383	29461538	0	530	40769231
Others	1	75	83426	1	80	107383
Total	859513	2862	3330	957794	3418	3569

*Provisional; **Revised estimate

SOURCE Tariff petition filed by JSEB for FY 2006-07

Table 5.9 shows the change in sanctioned load per consumer in FY 2005-06 over FY 2004-05. As observed, all the consumer categories except low-tension consumer have shown an increase in sanctioned load per consumer. This is a positive sign in terms of signalling regularization of connections by the Board. However, this positive development is partly negated by

extremely low values of sanctioned load per consumer for certain categories. For instance, the sanctioned load per consumer in case of domestic category is very low. The overall sanctioned load per consumer of 1.62 kW is also on the lower side.

Table 5.9 Sanctioned load per consumer for FY 2004-05 and FY 2005-06

	FY 2004-05*			FY 2005-06**		
	Number of Consumers	Sanctioned load (MW)	Sanctioned load per consumer (KW)	Number of Consumers	Sanctioned load (MW)	Sanctioned load per consumer (KW)
Domestic	771	321	0.42	866	410	0.47
Commercial	67	170	2.54	72	222	3.07
Irrigation & agriculture	13	42	3.19	10	50	5.03
Low Tension	7	295	43.45	8	335	41.92
High Tension	1	320	401.00	1	420	477.82
Railway Traction	0	117	9000.00	0	117	9000.00
Others	1	19	21.13	1	25	33.56
Total	859513	1265	1.47	957794	1554	1.62

*Provisional; **Revised estimate

SOURCE Tariff petition filed by JSEB for FY 2006-07

Status of rural electrification

As compared to the all India average of 43.5%, only 10% of the rural households in Jharkhand are electrified. A total of 3,422,425 households (90%) are still devoid of electricity, which clearly depicts the deprived state of affairs in Jharkhand.

Table 5.10 Rural Household Electrification (in' 000)

Total number of rural Households	Households having Electricity	Unelectrified Households	% Household unelectrified
3802	380	3422	90%

SOURCE Ministry of power, http://powermin.nic.in/JSP_SERVLETS/internal.jsp, accessed during December 2006

Further, if village electrification is considered, only 26% of the total villages in the state are electrified, which is much below the all India average of 79.86% for electrified villages. A total of 21713 villages are still without electricity in Jharkhand.

Table 5.11 Electrification of Villages (in' 000)

Total number of villages	Villages having electricity	Unelectrified villages	% Villages unelectrified
29	8	22	74%

SOURCE Ministry of power, http://powermin.nic.in/JSP_SERVLETS/internal.jsp, accessed during December 2006

As reported by Rural Electrification Corporation Limited (REC), it has cumulatively disbursed Rs.125.37¹ crore as loan assistance to Jharkand up to March 2005 and Rs.482 lakh as grant towards Kutir Jyoti Programme. The state has reported a release of 39018 Kutir Jyoti connections up to 31st March, 2004. This programme is being covered under the AREP from the FY 2004-05.

Also, the state has reported electrification of 15380 BPL rural HH during the FY 2004-05 (including the spill over connections under Kutir Jyoti programme), with REC sanctioning Rs 2.4 crore for 16000 Nos. of BPL rural households. A grant amount of Rs. 0.87 crore was drawn by the state for electrification of BPL households during 2004-05.

Further, Damodar Valley Corporation (DVC) has been entrusted by the MoP for formulation, preparation and implementation of Rural Electrification Projects² in eight districts namely, Dhanbad, Koderma, Bokaro, Giridih, Simdega, Gumla, Chatra & Hazaribag in the State under the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY). The Rural Electrification Projects are to be funded by REC that will act as a Nodal Agency to oversee the projects from concept to completion. All eligible payments under the intended contract are to be directly released by DVC under suitable arrangement with JSEB.

Efficiency improvement

Approach for fixing loss reduction targets

In FY 2003-04, the Board proposed a loss level of 38% i.e., a 9.6% reduction over the actual losses reported by them for FY 2002-03; however these estimates were not based on any system study. The Board further submitted that it would be able to achieve the proposed reduction in view of the massive metering programme that it was undertaking as part of the APDRP scheme, which included introduction of tamper proof electronic energy meters and feeder & distribution transformer metering.

The Commission in response to the Board's proposal opined that these losses could not be brought down suddenly and it may take a few years until these losses could be reduced to technically permissible levels. Hence, the Commission approved a reasonable reduction target of 5%, to bring down the loss level up to 42.66% in FY 2003-04 and adjusting the remaining 5% reduction through rate of return by not allowing any amount on

¹ Source: <http://www.recindia.gov.in/download/jharkhand.pdf>, accessed during January 2007

² Source: <http://www.dvcindia.org/notification/public.htm>, accessed during January 2007

this account for the purpose of tariff determination in FY 2003-04.

Table 5.12 T&D losses in Jharkhand for and FY 2003-04, FY 2004-05, and FY 2005-06

Description	FY 2003-04 Proposed	FY 2003-04 Approved	FY 2004-05 Actual**	FY 2005-06* Actual***
T&D Losses	38.00%	42.67%	51.00%	47.00%

SOURCE http://www.apdrp.com/apdrp/projects/pdf/AT&C_Loss_of_Power_Uilities.pdf, accessed during January 2007

* For the FY 2005-06, the overall T&D losses comprise 44.69% in sub-transmission & distribution and 6.17% as transmission losses.

Provisional; *Revised estimate

Since there was no tariff petition filed by JSEB for subsequent years, the actual loss levels were not reported. In the tariff petition filed by JSEB for FY 2006-07, the actual loss level (provisional and revised estimates respectively) for FY 2004-05 and FY 2005-06 is given as 51% and 47%. No justification has been provided by the JSEB for abnormally high increase in the loss level reported in the later years. This increase is indicative of the lack of efforts on the part of JSEB to reduce the loss level and also serious misreporting by them. The high level of loss also indicates high amount of theft and pilferage in the state. One reason for the high level of losses could also be high proportion of unmetered consumption in the overall consumption¹.

Collection Efficiency

In the tariff petition for FY 2003-04, JSEB calculated its revenue from sale of power based on 100% collection efficiency, and furnished no further information on the same. The Commission, however, after scrutinizing the supplementary information obtained from the JSEB concluded that Board had a collection efficiency of 89%. As against the billed amount of Rs.898 Crore the JSEB has collected only Rs. 800 Crore, which included dues outstanding against government organizations. Taking this into consideration, the Commission approved only 5% collection inefficiency and approved an interest on working capital to meet the same.

No separate details of collection efficiency have been provided in the tariff petition for FY 2006-07.

¹ The percentage of unmetered consumption in the total consumption is not available however; number of unmetered consumers in the total consumer base can be a reasonable proxy for deriving such an inference. The total number of unmetered consumers is approximately 36% in the total consumer base in FY 2005-06.

AT&C losses

Table 5.13 shows the AT&C losses in JSEB's system for FY 2002-03, FY 2003-04 and FY 2004-05. AT&C losses have increased from 53% in FY 2002-03 to 69.23% in FY 2004-05. As mentioned above, abnormally high increase in the AT&C losses highlights lack of initiative by the JSEB in bringing down the loss levels in the state.

Table 5.13 AT&C Losses of Power Utilities (%)

FY 2002-03	FY 2003-04	FY 2004-05
53%	65%	69.23%

SOURCE http://www.apdrp.com/apdrp/projects/pdf/AT&C_Loss_of_Power_Uilities.pdf and Tariff order FY 2003-04

Metering

Table 5.14 indicates the status of 11kV feeder metering, DT metering and consumer metering in the state. As observed, there has been no increase in the level of metering with percentage of metered consumers being stagnant over the last two years.

Table 5.14 Status of metering over the last two-years

Description	FY 2004-05			FY 2005-06		
	Nos.	Metered	% Age	Nos.	Metered	% Age
11-KV Feeder	461	396	86	461	396	86
Distribution Transformer	16500	15000	91	16500	15000	91
Consumer Metering (In Lakhs)	6.53	4.9	75	6.53	4.9	75

SOURCE www.powermin.nic.in/projects/pdf/Metering%20status%20of%20consumer.pdf, accessed during December 2006

Own generation

In FY 2003-04, JSEB proposed a gross generation of 1338 MU at a PLF of 24% and auxiliary consumption of 18%. As submitted by the Board, these estimates were based on the actual figures for FY 2002-03. The Board further submitted that few units of the plant were not able to generate optimally due to lack of adequate repair and maintenance work and few of them were out of operation as they were undergoing major repairs. The Board elaborated that tripping of units was very frequent; as a result they kept one or two units in reserve to activate them during tripping in order to maintain the integrity of the system. This caused a drop in the overall PLF of its thermal power station.

The Commission after scrutinizing the information submitted by the petitioner and visiting the plant expressed that it was shocked to witness such inefficiencies with respect to management of generation by the Board. It further pointed out that despite being a pit head station with adequate availability

of water for washing of coal, the plant has been performing at an extremely low PLF plagued with various inefficiencies arising due to the negligence of the Board's staff.

In view of the above, the Commission directed the Board to undertake necessary measures in terms of economic scheduling of working units in order to reduce SHR from its existing level and increase the PLF to its optimal level. It also directed the Board to account separately the consumption in the nearby areas of Patratu Thermal Power Station (PTPS) and estimate auxiliary consumption net of this level.

In response to the above directive, the Board claimed that it has signed an agreement with NTPC on 30th August 2005 under the Partners in Excellence Program of Ministry of Power, GOI. Under this programme, NTPC has deputed its seven engineers for two years to improve the performance of PTPS, especially for (a) improvement of PLF, (b) reduction in specific consumption of Oil, and (c) ash disposal.

Also, under the directive to account separately the consumption of power in the staff colony which was earlier sub netted as auxiliary consumption, the Board has made a proposal to install separate energy meters in colony and powerhouse and has undertaken certain steps to reduce the idle running of the equipments and improving the availability of the critical equipments. However, no action has been initiated to develop the fuel management system. The Board has submitted that it intends to appoint consultants for the same.

The Commission after analysing the past trends approved a PLF of 26% and an auxiliary consumption of 13% for FY 2003-04.

For Sikidiri Hydel Power Station too, the Commission observed past trends in generation and approved a gross generation of 116 MU for FY 2003-04.

Table 5.15 highlights the gross generation proposed and approved by the Commission in FY 2003-04 and actual¹ generation for FY 2003-04, FY 2004-05 and FY 2005-06.

¹ Provisional for FY 2004-05 and revised estimates for FY 2005-06 as submitted by JSEB in tariff petition for FY 2006-07.

Table 5.15 JSEB's Own Generation (Gross generation in MU)

Station	FY 2003-04		FY 2004-05	FY 2005-06
	Proposed	Approved	Actual*	Actual**
Patratu Thermal Power Station	1252	1189	1067	743
Sikidiri Hydel Power Station	86	116	129	142
Total	1338	1305	1197	885

*Provisional; **Revised estimate

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

As observed the overall generation in the state has deteriorated over the years with generation from both the stations witnessing a drop.

Plant Load Factor (PLF) of PTPS

In FY 2003-04, the Commission approved an average PLF of 27% for PTPS based on the past trends as against 24% proposed by the petitioner.

In the tariff petition for FY 2006-07, the Board reported a PLF of 11% and 13% for FY 2004-05 and FY 2005-06 respectively. This highlights a further deterioration in the plant performance.

Table 5.16 PLF of PTPS over the years

	FY 2003-04		FY 2004-05	FY 2005-06
	Proposed	Approved	Actual*	Actual**
PLF	24%	27%	15.8%	11%

*Provisional; **Revised estimate

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

Station Heat Rate (SHR) of PTPS

Table 5.17 gives the station heat rate of PTPS over the years. As seen the SHR proposed by the petitioner in FY 2003-04 was very high and was based on the actuals of FY 2002-03. The Commission in the tariff order for FY 2003-04 pointed out that the PTPS operated on a very high SHR level and directed the Board to undertaken immediate measures to improve the same.

Table 5.17 SHR of PTPS over the years

	FY 2003-04		FY 2004-05	FY 2005-06
	Proposed	Actual*	Actual*	Actual**
SHR (Kcal/kwh)	4269	4306	4315	4230

*Provisional; **Revised estimate

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

It is evident from the Table 5.17 that there has been no improvement in the SHR of PTPS over the last three years and

minimal efforts have been made by the Board to comply with the Commission's directive.

Auxiliary consumption of PTPS

In FY 2003-04, JSEB proposed a very high auxiliary consumption of 18% i.e. 238 MU. The Board submitted that this was high on account of common auxiliary facilities catering to two or more units and also due to consumption in the staff colonies & other commercial settings situated near the plant through station transformer. The Commission however, after analysing the information submitted by the Board approved auxiliary consumption of 13% and strongly emphasized the need to bring its level down. Table 5.18 highlights the auxiliary consumption of PTPS over the years.

Table 5.18 Auxiliary consumption for PTPS over the years

	FY 2003-04		FY 2004-05		FY 2005-06
	Proposed	Approved	Actual*	Actual*	Actual**
Auxiliary consumption	18.0%	13.0%	16.3%	19.8%	16.6%

*Provisional; **Revised estimate

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

As is evident, there has hardly been any improvement in the level of auxiliary consumption by PTPS over the last three years. Thus, on the whole, performance of JSEB owned plants has remained poor and has been deteriorating over the years.

Fuel Cost for Power Generation

Table 5.19 highlights the fuel cost incurred by JSEB over the years. The per unit fuel cost shows an increasing trend over the years. The percentage increase in FY 2005-06 over FY 2003-04 (approved level) has been 46.77%.

Table 5.19 Fuel Cost incurred by JSEB over the years (Rs. Crore)

	FY 2003-04		FY 2004-05		FY 2005-06
	Proposed	Approved	Actual*	Actual*	Actual**
Coal Cost (Rs.Crore)	NA	NA	79.6	60.4	78.3
Oil Cost (Rs.Crore)	NA	NA	63.4	48.1	50.0
Total fuel cost (Rs.Crore)	143	126	143	109	128
Net Generation (MU)	1014	1016	893	596	706
Fuel cost (Rs./Kwh)	1.42	1.24	1.60	1.82	1.82

*Provisional; **Revised estimate

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

Power Purchase Cost

Figure 5.3 shows the break-up of total energy requirement for FY 2003-04 (approved), FY 2004-05 (provisional) and FY 2005-06 (revised estimates). The state is witnessing an increased dependence on the outside purchase with own generation declining to a dismal percentage of 12% in FY 2005-06. Extremely low PLF, high auxiliary consumption and marginal capacity augmentation are reasons contributing towards this trend.

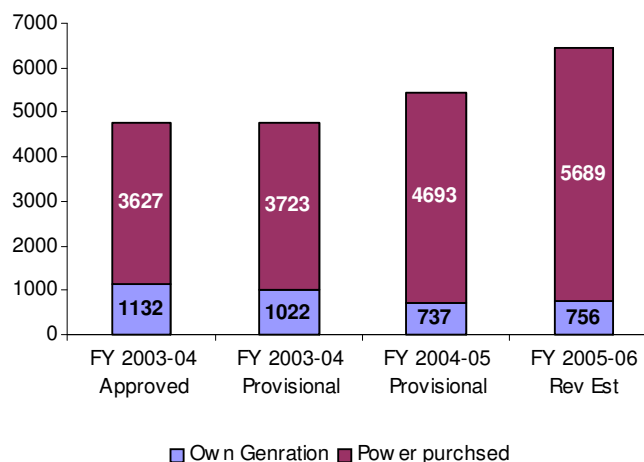


Figure 5.3 Break up of the total energy requirement (MU) for the FY 2003-04, FY 2004-05 and FY 2005-06

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the Tariff petition for FY 2006-07

Table 5.20 indicates the source wise power purchase along with corresponding costs over the years. As observed, majority of power purchase requirement is met from TVNL and DVC, both showing an increase in the per unit price. The overall price (per unit) has shown only marginal increase of 6.76% over the two-year period. The power purchased from WBSEB has been the costliest source of power for the state.

Table 5.20 Source wise power purchase costing and per unit cost for the FY 2003-04, FY 2004-05 and FY 2005-06

Plant	FY 2003-04*			FY 2003-04**			FY 2004-05**			FY 2005-06***		
	MU	Rs. Crore	Rs/Kwh	MU	Rs. Crore	Rs/Kwh	MU	Rs. Crore	Rs/Kwh	MU	Rs. Crore	Rs/Kwh
Chukha	19	2	0.93	14	2	1.29	53	8	1.53	158	24	1.58
Talcher	264	45	1.67	250	35	1.41	315	39	1.3	397	49	1.28
TVNL	1603	269	1.68	1132	189	1.67	1093	194	1.77	1309	241	1.84
Farakka	186	36	1.87	231	44	1.9	376	66	1.82	704	116	1.71
Rangit	2	1	2.11	2	1	3.11	20	7	3.6	43	13	3.01
Kahalgaon	136	31	2.23	155	36	2.29	332	66	2.07	533	92	1.78
DVC	1407	367	2.61	1876	486	2.59	2323	599	2.58	2511	710	2.83

Plant	FY 2003-04*			FY 2003-04**			FY 2004-05**			FY 2005-06***		
	MU	Rs. Crore	Rs/Kwh	MU	Rs. Crore	Rs/Kwh	MU	Rs. Crore	Rs/Kwh	MU	Rs. Crore	Rs/Kwh
WBSEB	0	0	0	27	11	4.08	29	12	4.28	34	14	4.23
PTC&NVVN	0	0	0	36	8	2.2	152	32	2.17	0	0	0
Total	3629	751	2.07	3723	812	2.26	4693	1023	2.18	5689	1259	2.21

* Approved; ** Provisional; *** Revised estimate

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

Table 5.21 shows the cost of power purchase as a percentage of total ARR over the last three years. As seen, power purchase cost forms a considerable percentage of the total revenue requirement of the Board and has consistently remained over 50% of the total ARR.

Table 5.21 Cost of power purchase as a % of ARR

Description	FY 2003-04 Approved	FY 2003-04 Actual*	FY 2004-05 Actual*	FY 2005-06 Actual**
Power Purchase (Rs. Crore)	758	908	1023	1259
ARR (Rs. Crore)	1334	1629	2043	2334
Power purchase as a % of ARR (%)	57%	56%	50%	54%

*Provisional; **Revised estimate

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

Operating expenses

Employee cost

Table 5.22 highlights the net employee cost for FY 2003-04, FY 2004-05 and FY 2005-06. As is evident, the actual employee cost for the FY 2003-04 was much less than both the Commission approved and that proposed by the JSEB. Further, the actual employee cost increased by 33.33% in FY 2004-05 over the previous year. The main reason for the same was pay revision arrear that the Board had to incur and inclusion of dearness pay. These amounted to Rs. 27.48 Crore and Rs. 39.00 Crore respectively. In FY 2005-06, the employee cost decreased marginally over the previous year.

Table 5.22 Employee costs for FY 2003-04, FY 2004-05, and FY 2005-06

Description	FY 2003-04		FY 2004-05	FY 2005-06
	Proposed	Approved	Actual*	Actual**
Net employee cost (Rs. Crore)	237.3	167.0	140.4	202.7

*Provisional; **Revised estimate

SOURCE Tariff petition filed by JSEB for FY 2006-07.

Employee Productivity

Table 5.23 indicates the employee cost as a percentage of total ARR over the years. This parameter shows a declining trend over the years signifying an improvement in the employee productivity.

Table 5.23 Employee cost per unit of ARR over the years

Year	Employee Cost (Rs Crore)	ARR (Rs Crore)	Employee Costs/ARR
FY 2003-04 (Approved)	168	1334	12.59%
FY 2003-04 (Actual)	140	1629	8.59%
FY 2004-05 (Actual*)	208	2043	10.18%
FY 2005-06 (Actual**)	203	2334	8.70%

*Provisional; ** Revised estimate

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

The trends in the employee cost per unit of sale highlighted in Table 5.24 also signify an improvement in the employee productivity.

Table 5.24 Employee cost per unit of sales over the years

Year	Employee cost per unit of sales (Paise/unit)
FY 2003-04 (Approved)	68.5
FY 2004-05 (Provisional)	72.7
FY 2005-06 (Revised Est.)	59.4

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

Table 5.25 shows trends in the number of employee per thousand consumers and employees per MU of sales. As seen, both the indicators witnessed a decrease, again indicating an improvement in employee productivity. Another important trend to be noticed in table 5.25 is the decreasing number of employees over the years.

Table 5.25 Trends in number of employees per thousand consumers and per unit of sale over the years

Year	Employees (Nos.)	Sales (MU)	Consumer (Nos.)	Employees/ 1000 consumers (Nos.)	Employees/MU of sale (Nos.)
FY 2003-04 Approved	7359	2469	NA	N.A.	2.98
FY 2004-05 Provisional	7268	2862	957794	7.59	2.54
FY 2005-06 Revised Est.	7028	3418	1091525	6.44	2.06

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

Revenue per employee over the years too has been increasing over the years highlighting an improvement in employee productivity.

Table 5.26 Revenue per employee for FY 2003-04, FY 2004-05 and FY 2005-06

Year	Employees (Nos.)	Revenue (Rs Crore)	Revenue per Employee (Rs/employee)
FY 2003-04 (Approved)	7359	966	1312678
FY 2004-05 (Provisional)	7268	999	1374518
FY 2005-06 (Revised Est.)	7028	1111	1580820

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

Repair and Maintenance Expenses

Table 5.27 shows R&M expenses for the FY 2003-04 (proposed, approved and actual), FY 2004-05 and FY 2005-06. In FY 2003-04, the Commission approved the same amount as proposed by the Board. This was an increase of 12% over the R&M expenses for the previous year. While approving the same, the Commission emphasized the need for JSEB to increase their own generation and ensuring good quality and reliability of supply.

The provisional data reported by JSEB highlights that the actual R&M expenditure in FY 2003-04 was less than the approved amount, i.e., it was only Rs. 29.66 Crore as against an approved amount of Rs. 48.57 Crore. However, provisional data for FY 2004-05 and FY 2005-06 highlights an increase over the actual amount of FY 2003-04. In FY 2005-06, the R&M expenses reported by the Board has increased by 38% over the previous year. The major increase has been in R&M of plant and machinery and lines, cable and network.

While increased R&M should result in higher generation and lower T&D losses, there has been no improvement in these parameters for JSEB. Instead of improvement, the situation has further worsened with T&D loss level increasing and own-generation decreasing. This raises serious doubts on the effectiveness of the expenditure incurred by the JSEB to improve the system.

Table 5.27 R&M expenses for FY 2003-04 (proposed, approved and actual), FY 2004-05 and FY 2005-06 (Rs. Crore)

Description	FY 2003-04		FY 2004-05	FY 2005-06
	Proposed	Approved	Actual*	Actual**
R&M expenses (Rs. Crore)	48.57	48.57	29.66	37.03
				50.84

*Provisional; **Revised estimate

Source: Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

Figure 5.4 highlights the R&M expenses as a percentage of the opening Gross Fixed Asset over the years. As discussed above, the R&M expenditure as a percentage of GFA has increased however there has been no commensurate improvement in the system parameters.

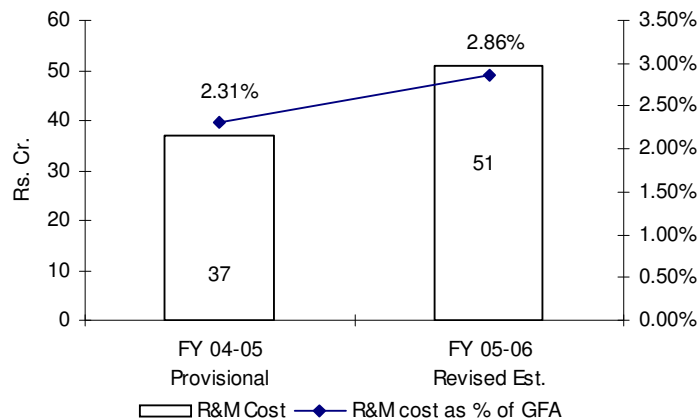


Figure 5.4 R&M expenses (Rs Crore) for the FY 2004-05 and FY 2005-06
SOURCE Tariff order FY 2003-04 and as reported by JSEB in the Tariff petition for FY 2006-07

Administration and General Expenses

Table 5.28 shows A&G expenses for the FY 2003-04 (proposed, approved and actual), FY 2004-05 and FY 2005-006. In FY 2003-04, the JSEB proposed A&G expenses at Rs. 36.6 Crore, representing an increase of 23% over the previous year. This proposed hike in the A&G expenses was primarily due to the sharp increase in the consultancy and books & periodicals

expenses, which witnessed an increase of almost 191% over the previous year. However, the Commission approved an amount of Rs. 30.27 Crore for FY 2003-04 providing only an inflationary increase over the previous year. However, the actual A&G expenses for FY 2003-04 were much lower than the Commission approved A&G expenses for FY 2003-04.

In FY 2005-06, A&G expenses witnessed a sharp increase of 56.5% over FY 2004-05. The main reasons for this were spiked increase in the rent, i.e., from Rs. 1.29 Crore in FY 2004-05 to Rs. 3.94 Crore in FY 2005-06 and expenses on private guards/home guard, i.e., from Rs. 2.12 Crore in FY 2004-05 to Rs. 11.28 Crore in FY 2005-06.

Table 5.28 A&G expenses for the FY 2003-04 (proposed, approved and actual), FY 2004-05 and FY 2005-06

Description	FY 2003-04			FY 2004-05	FY 2005-06
	Proposed	Approved	Actual*	Actual*	Actual**
A&G expenses (Rs. Crore)	36.66	30.27	21.80	29.20	45.70

*Provisional; **Revised estimate

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

Figure 5.5 highlights the A&G expenses as a percentage of sales and as a percent of total ARR. As observed, the A&G expense as a percent of the ARR declined in FY 2004-05 and then increased in the subsequent year indicating decline in the productivity.

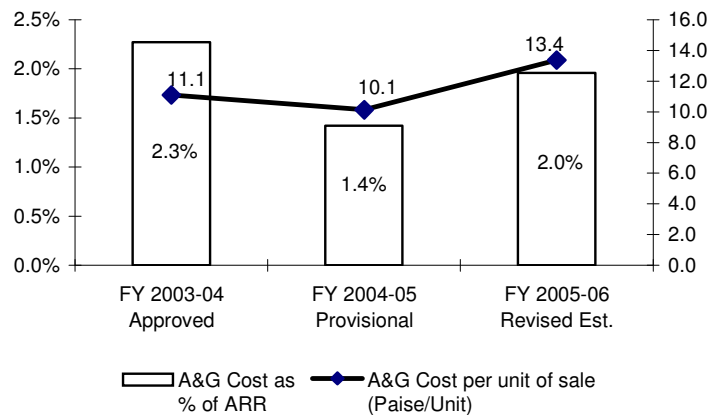


Figure 5.5 A&G expenses as percentage of ARR and per unit of sale for FY 2003-04, FY 2004-05 and FY 2005-06

SOURCE Tariff order for FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

Total Operating expenditure (Employee cost, R&M and A&G expense)

The operation and maintenance cost primarily consists of three major heads, namely Employee Costs, Repair and Maintenance

Expenses and Administration and General Expenses. Table 5.29 gives a consolidated picture of the movement in O&M expenditure over the years.

Table 5.29 Operating expenditure over the years

Years	Total Operating expenditure (Rs Crore.)	Per unit of sale (Paise/unit)	As a % of ARR
FY 2003-04 Approved	247.87	100.39	18.58%
FY 2003-04 Provisional	191.86	77.71	11.86%
FY 2004-05 Provisional	288.47	100.79	14.21%
FY 2005-06 Revised Est.	313.74	91.79	13.53%

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07.

As observed, the O&M cost per unit of sale and as the percentage of ARR has shown a decreasing trend over the years. This has been due to the much steeper rise in the ARR and the total sale rather than decrease in total operating expenditure which has a CAGR of only 9% as compared to the CAGR of 51% and 18% for the ARR and the total sales respectively.

Sources of Funds and Capital Expenditure

In FY 2003-04, the Board proposed an amount of Rs. 1045 Crore as expenditure on capital works. This was to be funded by way of borrowings to the extent of Rs. 631 Crore, Government grants of Rs. 408 Crore and internal resources of Rs. 13 Crore. The break-up of the same has been given in Table 5.30.

Table 5.30 Break-up of capital expenditure for FY 2003-04

Description	FY 2003-04 (Rs. Crore)
	Proposed
Generation	152
Transmission	150
Distribution	358
APDRP	187
Rural	
Electrification	129
Kutir Jyoti	3
PMGY	44
MNP	22
Total	1045

SOURCE Tariff order for FY 2003-04

While analysing the capital expenditure of the Board, the Commission remarked that it would not be able to validate the

claims of the Board in absence of any supporting document being filed by the Board. In addition, the Commission also expressed its concern on the uncertainty with regard to non-finalization of division of assets and liabilities between the BSEB and JSEB. Accordingly, the Commission created a contingency reserve and mentioned that any fresh capital expenditure incurred for either upgrading the transmission line for improving evacuation from TVNL and PTPS or for improving generation in PTP station by the JSEB shall be financed from this contingency reserve. The funds were to be released only after the board files the complete details about the expenditure incurred in this regard. This was particularly to avoid tariff fluctuations, as the Commission was not in favour of first lowering the tariffs by not taking into account any unforeseen liabilities and then increasing the tariffs when these liabilities become compulsory to incur.

The annual financial statements submitted by JSEB as part of tariff filing for FY 2006-07, indicate the following capital expenditure for FY 2004-05 and FY 2005-06.

Table 5.31 Break-up of capital expenditure for FY 2004-05 and FY 2005-06

Description	FY 2004-05	FY 2005-06
	Rs. Crore	Rs. Crore
Plan	Actual*	Actual*
Generation	78	183
Transmission	168	82.5
Distribution	127.13	83.99
APDRP	205	187.45
Rural Electrification	305.54	90
<i>Sub- Total</i>	<i>883.67</i>	<i>626.94</i>
Non-Plan		
Other Capital Ex.	3.74	10.19
Other Civil Works	4.7	0
<i>Sub- Total</i>	<i>8.44</i>	<i>10.19</i>
Total	892.11	637.13

*Revised estimate

SOURCE Annual financial statement for FY 2005-06 and FY 2006-07

Status of APDRP Schemes

Table 5.32 indicates the status of APDRP lending in the state. As seen the percentage utilization has been extremely low. Slow progress in augmentation of distribution network may also be one of the factors leading to high losses in the state.

Table 5.32 APDRP Investment status as on 30th June 2006

Project outlay	No. Of projects	Revised APDRP component (Rs. Crore)			Releases (including FY 2006-07) (Rs. Crore)	Utilisation %
		Grant	Loan	Total		
423.65	8	105.91	76.94	182.85	167.34	39.54

SOURCE http://www.apdrp.com/apdrp/projects/pdf/Investment_Component.pdf, accessed during December 2006

Status of PFC lending

Table 5.33 indicates the status of PFC lending in the state of Jharkhand.

Table 5.33 Status of PFC lending

Description	Total sanctions (Rs Crore)	Total disbursements (Rs Crore)
DVC	1.97	-
JSEB	223.42	66.04
TVNL	1892	-

SOURCE Power Line, Volume 11, No. 2, October 2006

Interest and Finance Charges

In FY 2003-04, the Board proposed a total interest liability (including finance charges) of Rs 158 Crore. The Board submitted that the estimates have been worked out by considering 13% interest rate and 25% liabilities of the erstwhile BSEB.

The Commission, however, stated that matter of bifurcation was still not clear and it would not be able to take any view on the quantum of loan and nature and extent of its interest liabilities prior to the bifurcation of the BSEB. Accordingly, the Commission created a temporary contingency reserve for unforeseen expenses arising out after the settlement of bifurcation of the BSEB. Further, for the purpose of estimating the interest on loan for FY 2003-04, the Commission has considered the loans taken by JSEB since FY 2001-02 (post bifurcation) and has provided an interest rate of 13% on the same.

Table 5.34 Loans given by the State Government for FY 2001-02 and FY 2002-03

	FY 2001-02 (Rs. Crore)	FY 2002-03 (Rs. Crore)
Generation	20	0
Transmission	40	61
Distribution	25	25
Building	2	0
MNP	0	34
APDRP loan	0	6
Total loans	87	126

SOURCE Tariff order FY 2003-04

In addition, the Commission also approved Rs 6.29 Crore as interest on working capital for meeting shortfall in revenue collection by 5%. This was computed after applying 13% interest rate on 5% of the approved revenue from tariff in FY 2003-04.

In the tariff petition for FY 2006-07, the JSEB has reported actual interest cost over the years. This is highlighted in Table 5.35.

Table 5.35 Interest cost over the years

Description	FY 2003-04	FY 2004-05	FY 2005-06
	Actual*	Actual*	Actual**
Generation	3.1	3.1	4.52
Transmission	14.29	15.66	24.75
Distribution	45.4	137.8	205.71
Building	0.31	0.31	0.31
MNP	4.42	8.32	16.37
Loan from PFC (APDRP)	0	3.76	5.81
Power purchase	18.75	34.57	44.14
APDRP	0.78	3.38	6.74
CPA	14.77	14.77	14.77
<i>Total - Interest on commercial loans</i>	<i>101.82</i>	<i>221.67</i>	<i>323.12</i>
State Gover. Loan	202.94	202.94	202.94
Total	304.76	424.61	526.06

* Provisional; **Revised estimate

SOURCE Tariff petition filed by JSEB for FY 2006-07

Although the interest cost should be based on 33% of the BSEB loans to be transferred to JSEB, as part of state bifurcation as per Ministry of Power (MoP), Government of India notification amounting to Rs. 267.88 Crore (on 33% loan). The Board has appealed against the MoP's notification in the Supreme Court regarding the rationale of bifurcation of loans to JSEB of 33% and has appealed for limiting the bifurcation of loans to 25% (corresponding interest amount works out to be Rs. 202.94). The same calculation has been adopted by the Board in reporting the actuals mentioned in Table 5.35. The case is pending before the Supreme Court.

Depreciation

Table 5.36 shows the depreciation amount for JSEB over the years. In FY 2003-04, the Board proposed an amount of Rs. 73 Crore as depreciation based on straight-line approach. The Commission in order to approve the depreciation amount for FY 2003-04 verified the provisional accounts of FY2001-02, and approved a depreciation amount of Rs 59.59 Crore.

In addition, the Commission in the tariff order for FY 2003-04 highlighted the following constraints in determining the accurate amount of depreciation: -

- Non-settlement of accounts between the BSEB and JSEB
- Non-maintenance of Fixed Assets Register by the Board
- Un-audited annual accounts and availability of only provisional account for FY 2001-02

The Commission also emphasised the need to classify the assets as per the MoP classification.

In the tariff petition for FY 2006-07, the Board has reported the depreciation amount for FY 2004-05 and FY 2005-06 as Rs. 73.62 Crore and Rs. 85.54 Crore respectively. The corresponding rates of depreciation have been indicated as 5.11% and 5.34%.

Table 5.36 Depreciation amount over the years

Year	Depreciation (Rs Crore)
	Proposed
FY 2003-04	73.00
	Approved
	59.59
	Actual*
	68.57
FY 2004-05	Actual*
	73.62
FY 2005-06	Actual**
	85.54

*Provisional; **Revised estimate

SOURCE Tariff order FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07.

Provision for Bad and Doubtful Debts

In FY 2003-04, JSEB proposed Rs.186 Crore towards bad and doubtful debts and submitted that this was calculated based on 10% of the total dues net of Government sector dues.

The Commission, in order to validate the claim of the Board enquired about the depreciation policy followed by the Board. In response, the JSEB stated that the erstwhile BSEB had a policy for making such provision in accounts, which is still in force. Further, it stated that it has not written off any bad debts in its books of accounts.

In view of the fact that no bad debts have been written off, which in some manner is also reflective of the lack of a clear policy and procedure, the Commission disallowed any bad debts for the previous years or for FY 2003-04.

The provisional accounts of JSEB for FY 2003-04, FY 2004-05 and FY 2005-06 indicate no provision for bad debts for these years.

Rate of Return

In the tariff order for FY 2003-04, Board proposed a return of Rs. 13.82 Crore based on the statutory rate of return of 3% on a net block of Rs. 460 Crore. The Board mentioned that the return is calculated as specified in Section 59 of the Electricity Supply Act 1948.

The Commission maintained that it would not be able to validate the capital base proposed by the Board due to lack of clarity in the segregation of fixed assets between JSEB and BSEB. Further, it emphasized need for the Board to improve its productivity in terms of reducing T&D losses and improving the PLF of its generating stations. Although a statutory expense, the Commission disallowed any return for FY 2003-04 and specified that Board should recover this by reducing its loss level.

The Board had proposed a reduction of 10% in the T&D losses for FY 2003-04, however the Commission realistically approved only 5% reduction. The Commission stated that the Board should make efforts to realize the proposed reduction (i.e. 10%) and the remaining amount of reduction above the approved level shall be enough to meet the statutory return. It estimated that 5% reduction in loss level would bring about Rs. 104 Crore per annum to the Board, which would be much higher than the proposed return amount.

In the tariff petition for FY 2006-07, the Board has again proposed a return based on 3% of capital base as per Electricity Supply Act 1948 despite the legislation being no longer in force. The JSEB has further submitted that it will estimate the reasonable return figure based on the equity post transfer scheme notification by Government of Jharkhand.

Contingency reserve

In the tariff order for FY 2003-04, the Commission has approved Rs. 110 Crore towards temporary contingency reserve to meet uncertain liabilities arising due to the following: -

- Settlement of accounts on bifurcation of assets and liabilities between the BSEB and JSEB, which might raise certain interest liabilities
- Auditing of accounts
- Fresh capital expenditure incurred for either upgrading the transmission line for improving evacuation from TVNL and PTPS or for improving generation in PTP station

While approving the same, the Commission has stated that the Board could avail this reserve only after submission of documents and proof of an unforeseen expenditure and shall

not transfer money from this account without approval of the Commission.

This creation of contingency reserve was particularly to avoid tariff fluctuations, as the Commission was not in favour of first lowering the tariffs by not taking into account any unforeseen liabilities and then increasing the tariffs when these liabilities become compulsory to incur.

Annual Revenue Requirement (ARR)

Table 5.37 shows the break-up of the ARR for FY 2003-04 (approved and actual), FY 2004-05 (actual) and FY 2005-06 (actual). As observed the actual expenditure in FY 2003-04 has exceeded the approved amount and also the actual expenditure in the subsequent years has been very high. The increase has mainly been on account of high power purchase cost and interest and finance charges.

Table 5.37 ARR (Approved and Provisional) for the FY 2003-04, FY 2004-05 and FY 2005-06 (Rs. Crore)

Description	FY 2003-04		FY 2004-05	FY 2005-06
	Approved	Actual*	Actual*	Actual**
Power Purchase	758	908.07	1149.85	1281.2
Generation Cost	126	148.84	114.51	134.45
Repairs & Maintenance	49	29.66	37.03	50.84
Employees Cost	167	140.4	208.41	202.74
Administration & General Expenses	30	21.8	27.03	43.36
Depreciation	60	68.57	73.62	85.54
Interest and Finance Charges	28	300.48	419.86	520.92
Bad Debts Provision	-	0	0	0
Interest on working capital	6		0	0
Total Expenditure	1224	1617.82	2030.31	2319.05
Statutory Return	0	11.63	12.37	14.59
Temporary Contingency Reserve	110	0	0	0
Gross Revenue Requirement	1334.00	1629.45	2042.68	2333.64
Non-tariff income	336.04 ¹	51.47	62.03	54.96
Net revenue requirement	997.96	1577.98	1980.65	2278.68

*Provisional, **Revised estimate

SOURCE Tariff petition for FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07.

¹ Major contribution to the same is on account of Delayed Payment Surcharge which was approximately Rs. 303.57 Crore as approved by the Commission

Table 5.38 shows the ARR per unit of sales for the FY 2003-04 (approved and actual), FY 2004-05 (actual) and FY 2005-06 (actual). As observed it has been increasing over the years, suggesting poor financial performance of the Board.

Table 5.38 ARR per unit of sales for the FY 2003-04 (approved and actual) FY 2004-05 and FY 2005-06

Description	FY 2003-04		FY 2004-05	FY 2005-06
	Approved	Actual*	Actual*	Actual**
ARR (Rs Crore)	1334	1629	2043	2334
Sale (MU)	2730	2470	2862	3418
ARR / Unit of sales (Rs/Unit)	4.89	6.60	7.14	6.83

*Provisional, **Revised estimate

SOURCE Tariff petition for FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07.

Tariff Rate Balancing

Tariff Rationalization

In the tariff order for FY 2003-04, the Commission emphasized that the tariff should be reflective of costs and directed the Board to submit tariff based on voltage-wise costs. This would also enable the Commission to work out the actual extent of cross-subsidy. The Commission also abolished minimum charges for Commercial, LT Industrial and Railways in order to discourage underreporting, theft and misuse of electricity. Alongside it directed the Board to collect details of the minimum charges collected from different categories of consumers and prepare a schedule of rational demand charge, which may replace minimum charge. The Board was also directed to collect details of category wise number of consumers who pay only the minimum charges.

In addition to the above, the Commission expressed its concern over the general practice of subsuming T&D losses under the higher unmetered consumption category, which resulted in underreporting of the T&D. Consequently, in order to encourage more and more consumers to opt for metered connection it introduced an optional metered tariff for domestic and commercial rural consumers, keeping it lower than the average realization from that category.

The Commission also observed concern over the deteriorating power deficit conditions and with the objectives of narrowing this deficit gap, incentivize off-peak consumption and disincentivize peak hour consumption introduced the time of day (TOD) tariff for high tension and extra high tension consumers.

The above, coupled with several other measures in the tariff design resulted in 18% reduction in the cross-subsidy in FY 2003-04. However, due to non-filing of tariff petition by the Board, there has been no further rationalization in the tariffs to various consumer categories.

New initiatives in tariff design

The Commission in the tariff order FY 2003-04 indicated the presence of high level of cross subsidy in the tariff structure of the state. It pointed out that while the Board recovered only 31%, 10% and 18% of the average cost from domestic, agriculture and streetlight respectively, its recovery was more than 140% from HT and EHT consumers.

In view of the above, major changes initiated by the Commission in the FY 2003-04 are given below

- Introduction of an optional metered tariff for unmetered rural consumers in the domestic and commercial category, keeping it lower than the average realization from that category in order to motivate more and more consumers to take metered connection and to bring down the general practice of subsuming T&D losses under the higher unmetered consumption
- Merger of CS-II (Category of Services) and CS-III consumer categories and merger of LTIS-I (Low Tension Industrial Services) and LTIS-II consumer categories. These categories were merged because the nature of services for these two categories were similar and the difference in the existing tariff was marginal
- Change in applicability of LTIS tariff by extending it to 107 HP. Correspondingly, HTS (High Tension Service)-I tariff made applicable for 107 HP and above
- Introduction of load factor rebate and voltage rebate for HT Consumers to incentivize the efficient customers
- Introduction of TOD tariff for HTS-I, HTS-II and EHTS consumers in order to incentivize off-peak consumption and dis-incentivize peak hour consumption for better management of the demand during peak and off-peak time gap
- Special tariff for military engineer (defence) services, as they have a mixed load like running educational institutions, hospitals, water supply installations etc and it is possible to distinguish these loads by providing separate connections

By initiating the above measures, the Commission intended to move towards a more rationalized tariff structure.

Category wise average realization

Table 5.39 shows the average realization for FY 2003-04 (existing and approved), FY 2004-05 (provisional) and FY 2005-06 (revised estimate). As observed in FY 2003-04, the average realisation from domestic, streetlight, irrigation and agriculture service consumers increased, while the realisation from commercial, LTIS, HTS and railway traction declined clearly highlighting a decrease in the level of cross subsidy.

On observing the actual data reported by JSEB for FY 2004-05 and FY 2005-06, it is observed that the average realization from domestic, street light, commercial has decreased and that of agriculture, LT and HT industry has increased. There has been a marginal reduction in case of railway traction.

Table 5.39 Category-wise average realization over the years

Category	FY 2003-04		FY 2004-05 ¹		FY 2005-06
	Existing*	Approved	Actual**	Actual***	Actual****
Domestic	1.10	1.49	1.03	1.21	1.25
Street light	0.64	1.03	0.90	0.50	0.96
Commercial	4.82	4.52	4.16	4.15	3.67
Irrigation	0.35	0.58	0.40	0.42	1.14
LT	5.19	5.09	4.19	4.26	6.08
HT	16.05	3.98	4.72	4.55	4.02
Railway Traction	4.96	4.69	5.04	5.07	4.67
Total	3.54	3.54	3.76	3.49	3.25

* At the tariff prevailing prior to issuance of tariff order for FY 2003-04

** As per the annual statement of accounts for FY 2003-04

*** Provisional; **** Revised estimates

SOURCE Tariff petition for FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

Cross Subsidy

In the tariff order for FY 2003-04 the Commission recognized the need for elimination of cross subsidy and tariff to be cost reflective. However, the Commission was of the view that any elimination of cross subsidy has to be gradual and coupled with natural load growth and efficiency improvement measures, without jeopardizing the financial viability of sector.

Accordingly, the Commission increased the tariffs of subsidized categories and decreased the tariffs of subsidizing categories, resulting in 18% reduction in cross subsidy. Table 5.40 shows category-wise the average realization as a percentage of average cost for FY 2003-04.

¹ The actual revenue reported by the Board shall also take into consideration the collection efficiency of the Board for that year. This however, has not been considered as part of approved revenue.

In the FY 2003-04, the Board was recovering a higher price from LTIS category than the average cost and recovering less than the average cost from all other categories. The overall recovery was also low at 72%.

Table 5.40 Average realization as percentage of average cost for FY 2003-04

Category	FY 2003-04
	Approved
Domestic	30%
Street light	21%
Commercial	92%
Agriculture	12%
LT	104%
HT	81%
Railway Traction	96%
Total	72%

SOURCE Tariff petition for FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

For the subsequent periods, there has been no revision in tariffs and the Board should have recovered the same percentage of cost. However, a scrutiny of actual data reveals that the recovery has further deteriorated indicating a decline in the collection efficiency by the Board. It also highlights gross negligence on the part of Board to recover its outstanding dues in a timely manner.

Table 5.41 Actual recovery as a percentage of average cost over the years

	FY 2004-05	FY 2005-06
	Actual*	Actual*
Domestic	17%	18%
Street light	7%	14%
Commercial	58%	54%
Agriculture	6%	17%
LT Industry	60%	89%
HT Industry	64%	59%
Railway Traction	71%	68%
Total	49%	48%

*Provisional; **Revised estimates

SOURCE Tariff petition filed by JSEB for FY 2006-07

Convergence Index

The movement in revenue realization from each customer category vis-à-vis average cost of supply can also be examined by computation of the Convergence Index (CI). Table 5.42 below gives the change in CI from the tariffs prevailing before the issuance of tariff order for FY 2003-04 and that approved by the Commission for FY 2003-04. As already stated above, there was an 18% reduction in the cross-subsidy in FY 2003-04. Post

FY 2003-04, no tariff filing has been made by the JSEB and hence tariffs have remained at the same level.

Table 5.42 Convergence index for FY 2003-04

Description	CI
CI at existing tariffs	0.48
CI at revised tariffs	0.39
Percentage improvement	0.18

SOURCE Tariff order for FY 2003-04

Subsidy Support from Government

In the tariff order for FY 2003-04, the Commission emphasized the need for Board to recover at least the energy cost incurred by it. The Commission estimated this as Rs. 1.86 per kWh as highlighted in Table 5.43.

Table 5.43 Energy cost of JSEB for FY 2003-04

Description	
Power purchase cost (Rs. Crore)	759.09
Generation cost (Rs. Crore)	126.06
Total Energy cost (Rs. Crore)	885.15
Energy Input (MU)	4761
Energy cost per unit (Rs. per unit)	1.86

SOURCE Tariff order for FY 2003-04

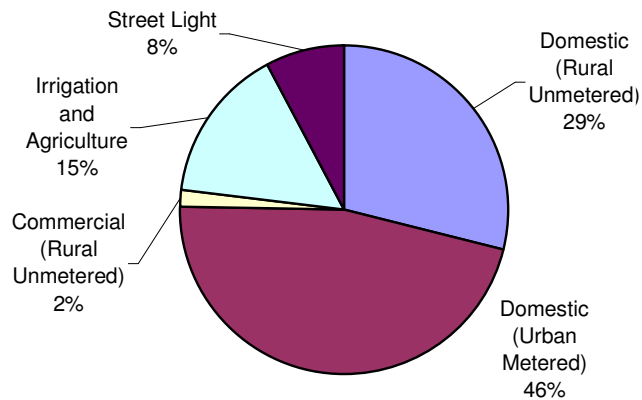
However, during the discussions held between the Commission and the Government, it emerged that increasing the tariffs to meet the energy cost shall lead to tariff shocks for the consumers. Accordingly, the Government agreed to pay the equivalent subsidy that assures the Board to recover at least the energy cost. For instance, if the Kutir Jyoti consumers were to pay the average cost of Rs.1.86 per kWh, this would generate revenue of Rs.1.44 Crore in a year. However, at the approved tariff of Rs. 27/connection/month, the revenue that is generated from this category is only Rs. 0.86 Crore. Thus, the Government was to provide this difference of Rs. 0.58 Crore for subsidizing Kutir Jyoti consumers. The subsidy that the State Government was to provide to the Board was therefore calculated on similar basis. This is highlighted in Table 5.44. This amount has been timely disbursed to the board by the state government.

Table 5.44 Total subsidy required from Government for FY 2003-04

Category	Subsidy (Rs Crore)
Domestic (Rural Unmetered)	11.55
Domestic (Urban Metered)	18.57
Commercial (Rural Unmetered)	0.68
Irrigation and Agriculture	6.14
Street Light	3.06
Total	40.00

SOURCE Tariff order for FY 2003-04

Figure 5.6 highlights the category-wise percentage break-up of the subsidy from the Government for FY 2003-04.

**Figure 5.6** Category-wise percentage break-up of the subsidy from the Government for FY 2003-04

SOURCE Tariff order FY 2003-04

Treatment of Revenue Gap

Table 5.45 shows the revenue gap for the FY 2003-04 (approved) and the actual revenue gap over the years. As observed the actual revenue gap has been much larger than that approved by the Commission in FY 2003-04. Further, the actual revenue gap in FY 2004-05 and FY 2005-06 has also been very high. Absence of tariff revision in the state due to non-filing of petition by the Board can be considered as one of the main reasons for the same.

Table 5.45 Revenue gap for the FY 2003-04 (approved and actual), FY 2004-05 (actual) and FY 2005-06 (actual)

Description	FY 2003-04		FY 2004-05	FY 2005-06
	Approved	Actual**	Actual**	Actual***
ARR	1334.11	1577.98	1980.64	2278.68
Revenue from existing tariff*	966.29	917.41	999.29	1110.88
Subsidy by GOJ	0.00	0.00	0.00	393.48
Sub Total	966.29	917.41	999.29	1504.36

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Misc. Receipts	336.04	0.00	0.00	0.00
Revenue Gap	31.78	660.57	981.35	774.33
Regulatory Asset	0.00	202.94	202.94	202.94
Net Revenue Gap	31.78	457.63	778.41	571.39
Revenue gap as % of ARR	2.38%	29.00%	39.30%	25.08%

* Incl. UI Receivables; **Provisional; *** Revised estimates

SOURCE Tariff order for FY 2003-04 and as reported by JSEB in the tariff petition for FY 2006-07

Governance

Public Participation

In order to undertake public consultation and solicit views of various stakeholders on the petition filed by the JSEB, the Commission after the acceptance of petition approved a public notice that was published in leading regional and national dailies. In addition, copies of the petition were made available to the public at a reasonable rate and the documents are posted on the website of the Commission.

In FY 2003-04, the Commission received a total of 104 objections. The objections were made on wide ranging topics including procedural issues, quality of filings, accuracy of information submitted, status of accounts, collection inefficiency, losses, depreciation etc with a good mix of objectors from industry, consumer groups, chambers, and other institutions.

The Commission at its end has taken steps to further improve the level of public participation. One such initiative taken by the Commission is “*Kya aap jante hai*” series to educate the consumer about their rights in terms of availing electricity supply from the Board. As part of this initiative, the Commission periodically publishes the information about facilities that consumers can avail and the provisions laid by the Commission for the betterment of the service in the leading newspapers¹.

Timeliness of Tariff Orders

JSEB filed the petition for determination of ARR and revision of tariffs for FY 2003-04 on 26th August 2003. However, the Commission returned the petition due to inadequacy of information and non-compliance of the guidelines for tariff filling by the Board.

¹ Under this series an interesting case came into light wherein a village under Ranchi zone filed a petition before the Commission against the Board for being denied connection, despite filling the application as per the rules and paying the requisite amount. In response to the same, electrification work has started in the village.

The Board resubmitted the revised petition on 4th November 2003, which was then accepted by the Commission. The final order was issued on 27th December 2003.

Further, the Commission directed the Board to submit the tariff petition for FY 2004-05 by 31st March 2004 however; no petition has been filed by the Board till date. It is only recently that JSEB has submitted the petition for FY 2006-07.

Consumer Advocacy and Redressal mechanism

JSERC notified the regulation for the establishment of Forum for Redressal of Grievances of the consumers and Electricity Ombudsman on 6th April 2005. The main objective of the regulations is to protect the interests of electricity consumers and to give them an additional forum to bring their complaints and grievances for quick redressal.

In accordance with the aforementioned regulation, the Board has formulated the three Consumer redressal forums in July 2006 for the areas of Bokaro, TISCO and JSEB. The Commission has also appointed the Ombudsman, who has been functioning since 1st Sept 2006.

Anti-theft measures

With the objective to reduce power theft and expedite the booking of the incidents of theft, a Deputy Inspector General (DIG) responsible for handling such cases was appointed by the state Government. However, formulation of the special courts as provided under the provision of Electricity Act is still pending.

Regulatory Initiatives

Implementation of Multi-year tariff framework

The Commission had issued draft terms and conditions for determination of tariff under MYT Framework in August 2006, however it is yet to notify the same. The draft regulations state that the multi-year tariff framework shall apply to applications made for determination of tariff for generation, transmission, wheeling and distribution and supply of electricity in the state. It states the following as uncontrollable and controllable factors.

Uncontrollable factors: -

- Force Majeure Events
- Changes in law, judicial pronouncements and Orders of the Central/State Government or Commission
- Economy-wide influences, such as unforeseen changes in inflation rate, market-interest rates, taxes and statutory levies

Controllable factors: -

- Capital expenditure
- Technical and commercial losses including bad debts
- Operating costs of licensees, which will include network costs and financing costs

Further, the regulation states that any gain or loss arising due to the variation in the price of fuel is to be dealt as per the Fuel Surcharge Adjustment Mechanism and aggregate gain or losses on account of uncontrollable factors is to be passed through an adjustment in tariff.

The first control period has been specified as 3 years.

Open Access

The Commission notified the regulations on Open Access for Intra-State Transmission and Distribution on 28th August 2005. According to the regulations, Open Access customers are allowed to avail access to the transmission system and distribution system in the following phases.

Table 5.46 Phasing of Open access

Phases	Condition	Date from which Open Access shall be allowed to open access customer
Phase I	25 MW and more	1-Nov-05
Phase I	10 MW or more	1-Apr-06
Phase II	1 MW or more	1-Apr-08

SOURCE JSERC (Open Access in Intra-State Transmission and Distribution) Regulations, 2005

The Commission has further mentioned that based on the experience of operation of open access in Phase I, it may revise the schedule for allowing open access in subsequent phases and may allow open access to consumers with less than 1 MVA contract demand at such time as it may consider feasible having regard to operational constraints and other factors.

Till date, Commission has issued only one order providing open access to TISCO for mining. However, this order has not yet been implemented and has been challenged in the court by the Board.

Appeals against orders

The Appellate Tribunal has so far issued order on the following case with respect to JSERC.

1. Appeal filed by the Central Coalfields Limited (CCL) against JSERC and DLF Power Limited (second respondent) on the issue related to tariff charged by DLF Power Limited from the CCL. The major points of contention in the case as summarized by the Tribunal are presented below.

- Whether the Regulatory Commission has the authority and jurisdiction to fix the tariff with respect to sale of power generated by the second respondent generator to the appellant, the exclusive consumer of power supplied through their own dedicated transmission line?
- Whether the Regulatory Commission has resolved and decided the dispute between the appellant and the second Respondent in terms of the arbitral clause in the agreement by invitation?
- Whether the order of the Regulatory Commission is by way of resolution of arbitral dispute between the parties in terms of the arbitral clause in the PPA entered between the appellant and the second Respondent? Whether such fixation is an arbitral award binding on the parties?
- Whether as against the award of the Regulatory Commission resolving the dispute relating to tariff, in terms of arbitral clause in the agreement and on invitation by parties an appeal is maintainable under Section 111 of The Electricity Act 2003?
- To what relief, the appellant is entitled?

This case was heard in the Appellate Tribunal for Electricity. The decision of the Appellate has been reproduced below: -

- Tribunal pronounced that the Regulatory Commission has neither the authority nor jurisdiction in terms of The Electricity Act 2003 to fix a tariff between the appellant, a consumer and the second respondent a generator being a commercial transaction pure and simple, which relationship is governed by an existing PPA. Further Tribunal opined that it is not an order or a tariff determination / order by the Regulatory Commission falling under one or more the provisions of The Electricity Act 2003, which alone is appellable.
- Tribunal articulated that the Regulatory Commission as an expert Arbitral Tribunal has resolved the dispute as referred to it by parties to the dispute on invitation and it is an award in terms of the PPA entered between the parties and it is enforceable as it has all the force of an arbitral award passed by a validly constituted Arbitral Tribunal.
- Tribunal enounced that no appeal is maintainable before the Appellate Tribunal for Electricity and appeal deserves to be rejected as not maintainable, as it is not in dispute that in law as against the award of an Arbitral Tribunal no appeal is maintainable before this Appellate Tribunal.
- Tribunal further enunciated that the resolution of dispute by the SRC is by way of arbitral proceedings and it is an award which is binding on the parties and maintained that Tribunal have neither the jurisdiction nor authority to

interfere with the impugned resolution of tariff by way of arbitration.

- .In the result, all the points were answered against the appellant and the appellant was not entitled for any relief in this appeal.

Result was pronounced in open court on 11th May 2006.

Studies undertaken

Board was to undertake various studies, as per the directive of the Commission in the Tariff order FY 2003-04, the list of these studies and the action taken by Board till date is provided under the section, *Directives issued by JSERC and their Compliance*.

Status of annual account

The finalization of accounts of JSEB has been highly delayed and the audited annual accounts are not available from FY 2002-03.

Staffing

The JSERC operates with a Chairman, two members, secretary and few other officers/ staff¹. It lacks adequate number of staff for carrying out its day-to-day activities. Staffing therefore remains a problem with the JSERC.

Status of directives issued by JSERC

Table 5.47 summarizes the status of directives given by JSERC in the tariff order for FY 2003-04. The status is based on the replies submitted by the Board in the tariff petition for FY 2006-07.

Table 5.47 Status of directives issued by JSERC in FY 2003-04

Summary of Directive	Status based on JSEB's reply
Sales estimates and projections	The Board has made no progress on the same and submitted that it shall
JSEB was directed to undertake a detailed study for load research and demand forecast and to estimate circle wise consumption by different categories including unmetered category and furnish circle-wise number of hours of supply to various categories of consumers	undertake the study after the unbundling. It has submitted the category wise actual energy consumption for various years and has provided information on circle level category of consumption, feeder wise no of hours of supply, No of hours of supply to HT& 33KV consumers. However, the Board stated that it does not have the system to segregate no. of hours of supply to various categories of consume

¹ Primarily support staff

Summary of Directive	Status based on JSEB's reply
T&D loss estimate and unmetered consumption	
<p>The Board was directed to formulate a task force for supervising the T&D loss in the state, which shall report to the Commission quarterly about the efforts that have been undertaken to reduce the loss levels.</p>	<p>The JSEB has submitted that it would like to set up a special committee at various locations in its area of operations for T&D loss reduction. Anti power theft cell has been formed under superintending engineer / executive engineer.</p>
<p>In addition, the Board should undertake a proper energy audit of its system and provide a voltage-wise break-up of technical and commercial losses in the next petition.</p>	<p>No information / results have been submitted to the Commission. JSEB has just submitted that the process is ongoing.</p>
<p>The Commission further directed the Board to undertake a study to estimate category wise unmetered consumption and provide the results in the next petition.</p>	<p>No progress has been made till date. The Board has submitted that it has initiated the process to appoint the consultant to study the un-metered consumption in certain divisions of Jharkhand.</p>
Performance of PTPS substation	
<p>The Board was directed to undertake necessary steps to reduce SHR and increase the PLF to its optimal level and to separately account the consumption in the nearby areas of PTPS and estimate auxiliary consumption net of this level.</p>	<p>JSEB has submitted that it has signed an agreement with NTPC on 30th August 2005 under partners in Excellence Program of Ministry of Power, GOI. Under this programme, NTPC has deputed its seven engineers for two years to improve the performance of PTPS, especially (a) improvement of PLF, (b) reduction in specific consumption of Oil, (c) ash disposal.</p>
<p>The Commission further directed the Board to step up its supervision to reduce this loss.</p>	<p>No action till date has been initiated to develop the fuel management</p>
<p>The Board was also to submit an action plan with in three months for proper fuel management system to improve the efficiency of plant.</p>	<p>system. The Board has submitted that it intends to appoint consultants for the same.</p>
Evacuating 100% power from TVNL station	
<p>The Board was directed to undertake necessary capital and R&M expenditure to augment its transmission capacity for evacuating 100% power from TVNL station, and an action plan in this regard should be submitted to the Commission within one month from the date of issue order for FY 2003-04.</p>	<p>The progress of the Board has been slow on this front too. It has submitted that it is planning construct the following lines: -</p> <ul style="list-style-type: none"> ▪ 400 KV double circuit TTPS Ranchi line ▪ Construction of 220KV TTPS Haldia (Ranchi) double ckt transmission line ▪ Const. Of 220kv double ckt TTPS Govindpur transmission line
Quality of supply and service	
<p>The JSEB was directed to prepare and submit to the Commission a proposal on a set of standards of performance along with penalties for non-adherence to these. The petition was</p>	<p>As reported by the JSEB, it has already submitted the requisite information.</p>

Summary of Directive	Status based on JSEB's reply
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also to include the condition for minimum hours of supply that the Board has to supply.

Non-Conventional Energy

The Board was directed to submit in three months their plan of action and strategy for rural electrification through promotion of non-conventional form of electricity. It was also directed to coordinate with JREDA (Jharkhand Renewable Energy Development Agency) in this strategy/approach. regard for successful implementation of various initiatives.

The Board's progress in this regard has been slack. It has submitted that it has written a letter to JREDA requesting to prepare a plan of action and strategy for rural electrification through promotion of Non-conventional sources of energy and has also sent a list of villages/tolas, which are remote for grid connectivity. However, the Board has planned no detailed strategy/approach.

Next Tariff petition and auditing of accounts

The Commission directed the Board to come up with a new petition for FY 2004-05 removing the various data deficiencies highlighted throughout the tariff order.

The Board has not complied with the directive and the final audited accounts are still awaited.

It also directed the Board to audit the books of accounts for FY 2001-02 and FY 2002-03 and submit the same to the Commission by March 2004.

SOURCE Tariff petition by JSEB for FY 2006-07

Regulation notified by JSERC

The Regulations and Guidelines issued by the Commission since its inception are given in Table 5.48.

Table:5.48 Regulation and guidelines issued by the Commission

S.No.	JSERC Regulation	Date
1	JSERC (Conduct of Business Regulations) Order 2003	10 th July 2003
2	JSERC (Miscellaneous Order) 2003	18 th August 2003
3	JSERC (State Advisory Committee) Regulations 2003	29 th October 2003
4	JSERC (Terms and Conditions for Determination of Thermal Generation Tariff) Regulations, 2004	11 th August 2004
5	JSERC (Terms and Conditions for Distribution Tariff) Regulations, 2004	21 st September 2004
6	JSERC (Guidelines for Establishment of Forum for Redressal of Grievances of the Consumers and Electricity Ombudsman) Regulation, 2005	6 th April 2005
7	JSERC (Open Access in Intra-State Transmission and Distribution) Regulations, 2005	28 th June 2005

S.No.	JSERC Regulation	Date
8	JSERC (Distribution License Conditions) Regulations, 2005	5 th July 2005
9	JSERC (Electricity Supply Code), Regulations, 2005	28 th July 2005
10	JSERC (Distribution Licensees' Standards of Performance), Regulations, 2005.	17 th August 2005
11	JSERC (Delegation of financial powers) regulation, 2004	10 th February 2004
12.	Draft (Terms and conditions of tariff determination, Multi-year tariff framework) Regulation, 2006	-

SOURCE www.jserc.org assessed during December 2006

Power sector rating

As per the performance rating of the state power sector carried out at the instance of the Ministry of Power, GoI, Jharkhand has been given the following ratings during FY 2004-05 and FY 2005-06.

Table 5.49 Power sector rating

	FY 2004-05	FY 2005-06
Rank	29	24
Score	3	4

SOURCE http://powermin.nic.in/whats_new/SEB/index.htm, accessed during December 2006.

The state of Jharkhand moved up five notches from 29th to 24th in FY 2005-06. The ranking report highlighted the following strengths and weaknesses:

Strengths

- Regulator has reduced cross-subsidy in tariff (i.e. reduced high tension tariff and increased tariff of domestic consumers)

Weaknesses

- Unbundling on functional lines yet to be completed
- ARR for 2004-05, 2005-06 and 2006-07 not filed by JSEB; affecting the timeliness of tariff orders
- Limited financial support from Government of Jharkhand
- Generating capacity has not been increased over the last 3 years
- Very low operating performance of plants
- Quality of data and MIS availability needs significant improvement
- Open access regulations have been finalized, however, open access charges not formulated

Conclusion

- The unbundling of the SEB is yet to be completed in the state. Extension has been granted twice, however there has been very little progress in this direction
- Although, the Commission tried to reduce the level of cross subsidy in Tariff order FY 2003-04, still the industrial consumers are paying more and domestic & agricultural consumers are paying less than their average cost of supply
- No guidelines for the efficiency improvement have been formulated to bring down the inefficiencies of the board, which remain very high
- The availability and reliability of the data reported by the JSEB remains a serious concern as the annual accounts submitted by the Board are unaudited and uncertified.
- There has been limited capacity addition in the state. The performance of the existing plants has deteriorated significantly over the years. This has also resulted in increased dependence of the Board on outside power purchase
- The loss levels in the state have been increasing. The actuals reported by JSEB shows a significant increase in the AT&C loss levels over the last three years. No reason and explanation has been provided to justify the loss levels reported
- Still a considerable proportion of the total consumers (36% in FY 2005-06) are unmetered and 90% of the rural households still do not have access to electricity
- Since there has been no tariff petition after the Tariff order FY 2003-04 the financial viability of the sector in the state has seen further deterioration with Loss level increasing sharply, PLF of the state generators going down, under recovery of the cost, increasing of the revenue gap, high collection inefficiency, poor quality and reliability of supply and with increasing level of tariff distortion.

CHAPTER 6 Kerala

Introduction

The Kerala State Electricity Commission (hereinafter referred to as the KSERC or Commission) was established under section 17 (1) of Electricity Regulatory Commissions Act (ERC Act), 1998 on 14th November 2002. The KSERC was mandated to exercise powers and functions conferred under section 22(1) of the ERC Act. After the enactment of the Electricity Act 2003 (hereinafter referred to as the Act or EA 03) in June 2003, the Commission was mandated to exercise powers and functions conferred to it in section 86 of the Act.

The Commission issued its first tariff order for Kerala State Electricity Board (KSEB) in FY 2003-04. Following this, the Commission issued tariff orders for KSEB in FY 2004-05, FY 2005-06 and FY 2006-07.

KSEB still operates as a vertically integrated utility and no unbundling/corporatization has taken place. The Central Government had granted an extension for it up to June 2006, however still no action in this regard has taken place and neither is there any indication as to when this will take place.

Demand Supply Gap

Power supply position in Kerala indicates both energy and peak deficits. Table 6.1 give the energy and peak situation from FY 2001-02 to FY 2005-06.

Table 6.1 Energy availability / requirement

Year	<i>Surplus/Deficit</i>	
	Energy %	Peak %
FY 2001-02	-7.4	-16.90
FY 2002-03	-6.9	-16.30
FY 2003-04	-3.8	-9.80
FY 2004-05	-1.2	-1.3
FY 2005-06	-0.5	-0.8

SOURCE Monthly review of power sector (executive summary), Central Electricity Authority, www.cea.nic.in, Accessed on June 9, 2006

Table 6.2 indicates the hydro-thermal mix in the state over the years.

Table 6.2 Hydro-thermal mix in the state (Actual)

Year	Hydel (MU)	Thermal (MU)	Total (MU)	Hydel (%)	Thermal (%)
1992-93	6193	1062	7255	85%	15%
1993-94	5822	2020	7842	74%	26%
1994-95	6571	2249	8820	75%	25%
1995-96	6682	2672	9354	71%	29%
1996-97	5474	3126	8600	64%	36%
1997-98	5048	4378	9426	54%	46%
1998-99	7305	3652	10957	67%	33%
1999-00	7038	4738	11776	60%	40%
2000-01	6167	6295	12462	49%	51%
2001-02	6716	6057	12773	53%	47%
2002-03	4819	7932	12751	38%	62%
FY 2003-04	3910	8545	12455	31%	69%
2004-05*	6000	6524	12524	48%	52%
FY 2005-06*	6485	6114	12599	51%	49%

*Based on approved figures from tariff orders

SOURCE ARR tariff petition for FY 2005-06

As seen from the above, the proportion of hydro generation in the total energy requirement has reduced over time. This is because the capacity addition in hydro has not been commensurate with the increased demand causing increased dependence on the costly thermal power sources. Also, in FY 2002-03 and FY 2003-04, the hydel generation had reduced considerably because of reduced inflow due to bad monsoons in the state. The hydel generation in FY 2004-05 and FY 2005-06 however, has improved resulting in lower cost to the utility.

This report analyses the tariff order issued by the KSERC for FY 2003-04, FY 2004-05 and FY 2005-06. The parameters are discussed under 5 broad heads viz. consumption and access, tariffs and rate balancing, efficiency improvement, investment and governance and public participation.

Movement in Installed capacity

Figure 6.1 highlights the installed capacity in the state over the years and Table 6.3 indicates the installed capacity in FY 2000-01 and capacity addition over the years.

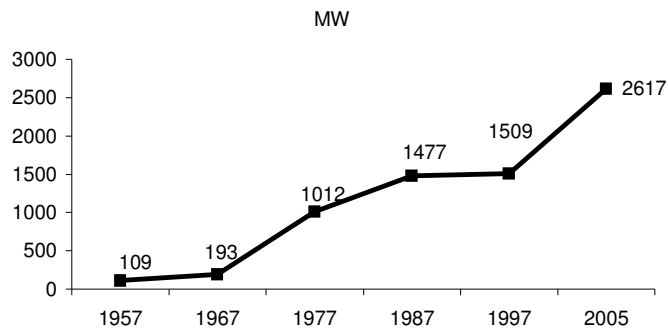


Figure 6.1 Installed capacity in Kerala over the years

SOURCE: ARR and ERC filing for FY 2006-07

As observed, although there has been reasonable capacity addition in the state over the years, majority of it has come in the form of allocations from the Central Generating Stations.

Table 6.3 Capacity additions in the state over the years

Generation	Additions during the year						Total additions
	As on 2000-01	FY 2001-02	FY 2002-03	FY 2003-04	FY 2004-05	FY 2005-06	
Capacity Additions (MW)	2420.7	180.5	0.0	12.6	3.0	14.0	210.0
Allocations from CGS (MW)	454.0	56.0	285.0	72.0	90.0	225.0	728.0

SOURCE: ARR tariff petition for FY 2005-06 and FY 2006-07

FY 2002-03 in retrospect

The audited revenue accounts of KSEB for FY 2003-04 showed a profit of Rs. 139.65 Crore as on 31st March 2003. (Table 6.4)

Table 6.4 Profit/ (loss) of KSEB for FY 2004-05

Description	Amount (Rs. Crore)
Income	3722.53
Expenditure	3582.87
Profit	139.65

SOURCE: Annual accounts of KSEB for FY 2003-04

Consumption and Access

Sales/demand estimation

The methodology used by KSEB for estimating demand in FY 2003-04 and FY 2004-05 involved developing representative daily load curve for each month of previous year based on actual/estimated data. From the representative load curve of past year, an estimated representative load curve of ensuing year was derived by making suitable adjustments for changes in the number of consumers and consumption pattern. The

unrestricted load demand projections were obtained after allowing for the demand not met due to load shedding.

In the tariff orders for FY 2003-04 and FY 2004-05, the Commission urged the KSEB to take up complete computerisation of billing so as to have more reliable projections of sales. It also recommended a detailed analysis of load demand and energy requirement. Development of individual load curves of each major category of consumers was required to address the issues regarding load management, reduction of losses and cost of service. The same has not been completed till date¹.

In FY 2005-06, KSEB projected LT category wise sales based on estimated number of consumer, which in turn was estimated, based on growth rate of past two years. The sales of HT consumers have been estimated based on first six month actual sales for FY 2004-05 and percentage growth rate for FY 2003-04 and FY 2004-05. The KSEB attributed the increase in sales due to reduction in the load shedding to domestic and commercial consumers.

Figure 6.2 shows trend in sales to various consumer categories. It is observed that over two-year period, the overall percentage increase in the sales has been 10.5%² with the LT category witnessing the highest increase i.e. 12.9% followed by HT category i.e. 12.7%. The EHT sales have shown a trend reverse of other categories with sales declining by 5.7%.

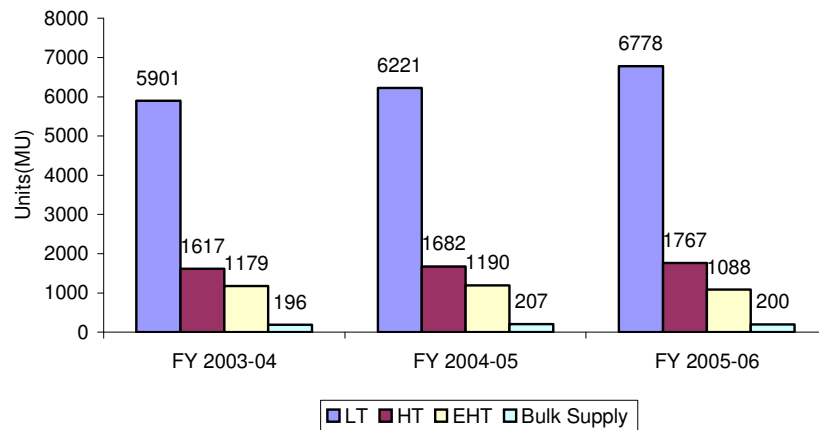


Figure 6.2 Trend in sales to LT, HT, EHT and Bulk supply category
SOURCE Tariff orders issued by KSERC (Based on approved figures)

¹ As discussed with the KSERC, this has not been taken up actively by the KSEB; there has been no push by the Government to undertake complete computerization in their Departments.

² The increased is based on the actual sales in 2003-04 and approved sales in 2005-06

Category-wise sales

Table 6.5 shows a comparison of the category-wise sales approved by the Commission vis-à-vis the proposed and actual sales for that year.

Table 6.5 Trends in the sales to various consumer categories All figures in MU

Category	FY 2003-04			FY 2004-05			FY 2005-06	
	Proposed	Approved	Actual	Proposed	Approved	Actual	Proposed	Approved
LT								
Domestic	3958	3935	4004	4143	4133	4262	4630	4541
Industrial	699	748	751	804	795	783	835	873
Irrigation	199	196	202	223	196	191	210	202
Commercial	851	863	879	921	920	948	1012	974
Public Lighting	167	167	166	177	177	183	190	188
Subtotal LT	5874	5901	6002	6268	6221	6366	6877	6778
HT								
Industrial	1325	1185	1125	1214	1185	1238	1240	1241
Non Industrial	90	127	130	132	137	141	144	150
Agricultural	9	8	9	10	8	9	9	8
Commercial	219	297	304	340	352	339	373	368
Subtotal HT	1643	1617	1568	1696	1682	1727	1766	1767
EHT								
66kV	313	290	267	270	291	286	267	267
110kV	1007	839	841	857	839	750	765	765
Railways	50	50	46	50	60	44	56	56
Subtotal EHT	1370	1129	1154	1177	1190	1079	1088	1088
Bulk Supply	193	196	188	203	207	212	200	200
Total	9080	8901	8912	9344	9300	9384	9852	9833

SOURCE Tariff orders for various years issued by KSERC and ARR petition filed by KSEB for FY 2006-07.

As observed from the above, there is no major deviation between the proposed, approved and the actual figures. The highest increase in sales has been in case of commercial (including both HT and LT) and domestic category i.e. 12.4% in both the cases. Domestic category constitutes 46% in the total sales in the state (FY 2005-06).

A striking trend that is observed in Table 6.5 is that EHT sales have been decreasing over the last three years, resulting in the loss of revenue to various categories. EHT sales in FY 2003-04 were 1154 MU (actual) with average tariff of Rs. 4.43 per unit resulting in total revenue of Rs. 511 Crore. In FY 2005-06, the sale decreased to 1088 (approved). The average tariff in FY 2005-06 was Rs. 3.65 per unit resulting in total revenue of Rs. 397 Crore. Thus, the total revenue loss to the Board was Rs. 114 Crore. While a part of loss was due to reduction in the average tariff, a major portion would be on account of decrease in sales. Further, since the connected load of these consumers has increased marginally, the fall is mainly due to fall in the load factor of these consumers.

Given below is the approach adopted by the Commission in finalizing sales to each consumer category.

- **Domestic:** In estimating the sales for domestic category, the Commission approved a growth rate of 6.5% in FY 2005-06 over the previous year i.e. 1% higher than the growth rate in FY 2003-04 over the previous year. This was done keeping in view the possible increase in number of connections and backlog applications to be serviced in a time bound manner.
- **LT Industrial:** In estimating the growth for LT Industrial category the Commission considered the past trends. While past growth rate for this category was over 12%, the Commission for FY 2005-06 has considered 10.5%, equivalent to growth rate in FY 2004-05 over FY 2003-04. One of the reasons for increased load proposed by the KSEB for this category was due to increase in threshold limit to 150 kVA from 100 kVA. The Commission had earlier communicated to the KSEB that any increase in industrial load in LT category would stress the LT network, which would have an adverse impact on the system resulting in increased distribution losses and excessive voltage drops. Keeping this in mind the Commission advised the Board to limit the connected load of LT industrial consumers to 100kVA and any load higher than this would be serviced by HT connections. Consistent with this approach, for FY 2005-06 Commission considered that half of the increase in the load would get added to HT industrial category resulting in net growth rate of 7.8% for LT industrial category for FY 2005-06.
- **Agricultural:** The Board had projected a growth of 2.3% i.e. assuming a good monsoon for FY 2005-06. The Commission, however, has approved the same level of sales as that in FY 2003-04.
- **Industrial:** In FY 2005-06, the Board projected a growth 4.4% increase in HT industrial consumption and 3.4% for EHT industrial consumption. The Board stated that proposed industrialization at Kochi and Thiruvananthapuram (industrial parks), starting of Vallarpadam container project, rationalization of tariff by the Commission etc would increase the industrial consumption in the state. Several steps taken by the Board including permission for payment of dues in instalment, waiver of MD charges during the period of closure etc might increase the consumption in future. The Commission was of the view that industrial consumption in the state may increase particularly at the high voltage levels if the Board makes intensive efforts. The Commission had issued an order streamlining the incentives for power factor improvement and differential pricing for time of day

consumption. In view of these developments the Commission approved a growth rate of 5% for HT Industrial category.

- **Commercial:** Increase in small and medium range commercial activities in the state added to LT commercial consumption over the period. In addition, the LT commercial consumers using diesel generators during peak period as well as normal period were expected to shift to the grid power due to reasons such as price hike in diesel, improved grid voltage level, and reduced power interruption. The Commission therefore approved a growth rate of 5.27% in LT Commercial and 10% for HT Commercial.

Number of consumers and connected load

The numbers of consumers have increased from 1.06 lakh in 1957 to 78 lakh in 2005. Fig. 6.3 indicates the growth in number of consumers over the years.

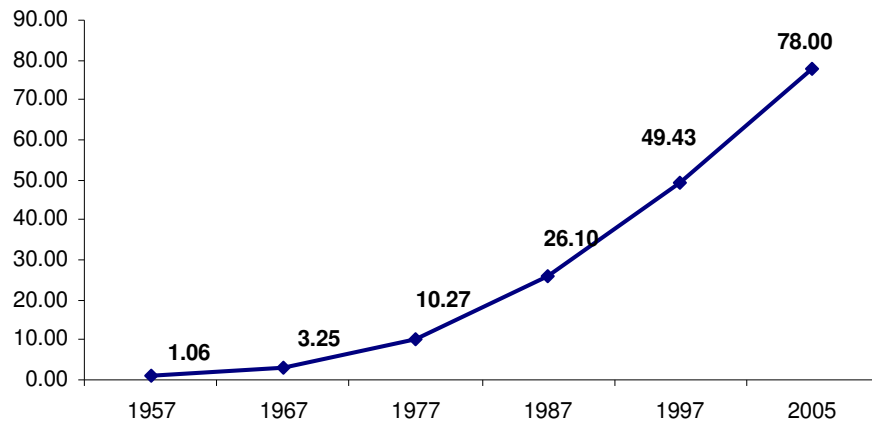


Figure 6.3 Number of consumers over the years

SOURCE ARR and ERC filing, 2006-07

Category-wise analysis indicates that domestic consumers constitute 79% of the total consumer base followed by 14% in case of Commercial (Figure 6.4).

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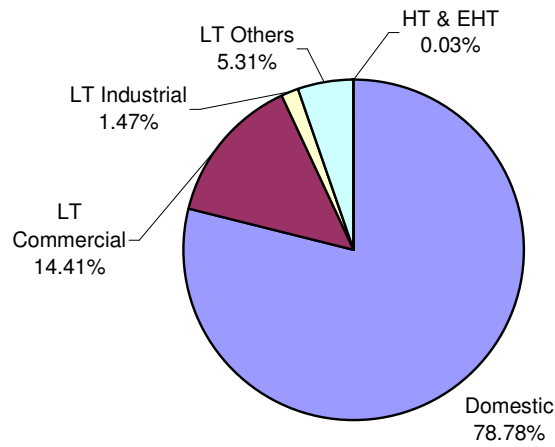


Figure 6.4 Consumer mix in the state (FY 2004-05)

SOURCE ARR and ERC filing, 2006-07

The total connected load in FY 2004-05 was 10334 MW, an increase of 4.28% over FY 2003-04 (9910 MW). Figure 6.5 shows the category-wise break up of the connected load in FY 2004-05.

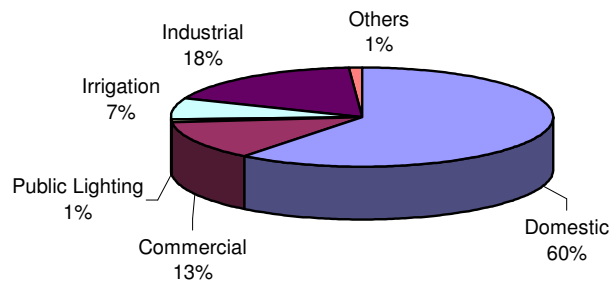


Figure 6.5 Break-up of the connected load (FY 2004-05)

SOURCE ARR and ERC filing, 2006-07

Observations

Table 6.6 indicates the sales and revenue contribution of various consumer categories in FY 2004-05.

Table 6.6 Sales and revenue contribution of various consumer categories in FY 2004-05 (based on actual figures)

Category	No. of consumers as on 31.03.05	% of total consumers	Consumption	% of total consumption	Revenue	% of total revenue
	Nos. (in '000)	%	MU	%	Rs. Crore.	%
Domestic	6143	78.7	4262.3	45.4	751.6	25.7
LT Commercial	1124	14.4	947.6	10.1	633.6	21.7
LT Industrial	115	1.47	782.9	8.3	324.7	11.1
LT Others	414	5.32	373.50	3.9	52.2	1.7
HT & EHT	2	0.03	3018.10	32.1	1155.1	39.6
Total	7799	100	9384.40	100	2917.3	100

SOURCE ARR and ERC filing, 2006-07

As seen from the above, while domestic consumers constitute 79% of the total consumer base accounting for 45% of the total sales, their contribution towards the total revenue is only 25.7%. On the other hand, HT & EHT consumers, which constitute only 0.03% of the total consumer base, account for 32% of the consumed energy and 39.6% towards the total revenue. This is further elaborated in Figure 6.6 and 6.7.

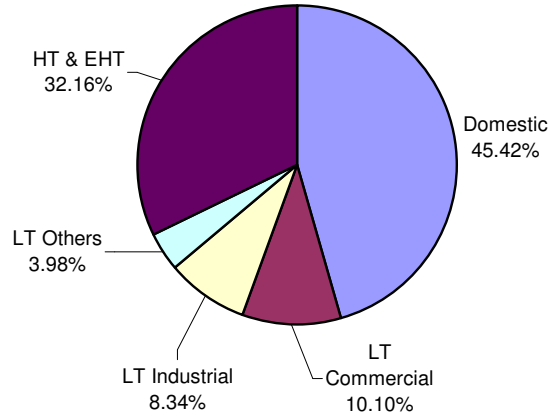


Figure 6.6 Category-wise consumption pattern in FY 2004-05

SOURCE ARR and ERC filing, 2006-07 (Based on actual-consumption)

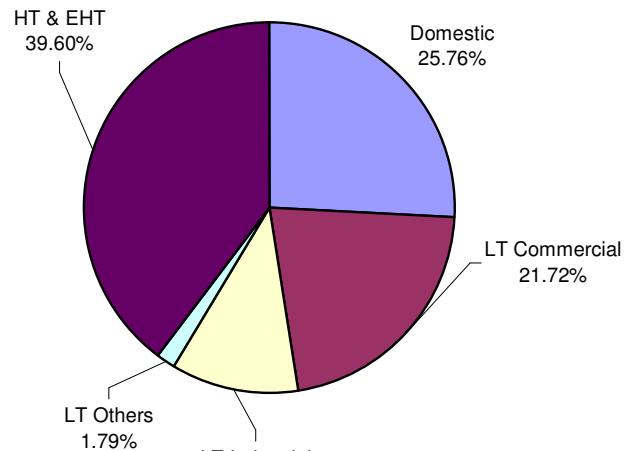


Figure 6.7 Category-wise revenue in FY 2004-05

SOURCE ARR and ERC filing, 2006-07 (Based on-actual revenue)

Based on the above, the average consumption per consumer for various categories is indicated in Table 6.7.

Table 6.7 Average consumption per consumer (based on actuals of FY 2004-05)

Consumer category	Average consumption (Units per consumer)
Domestic	693.8
LT Commercial	843.1
LT Industrial	6807.8
LT Others	902.2
HT & EHT	1509050.0
Total	1203.4

SOURCE: Teri estimates

From the above it is evident that the average consumption per consumer is considerably low. For instance, in case of domestic consumers the average consumption per day works out to be 1.89 units, which is very low.

Table 6.8 indicates the change in number of consumers and connected load per consumer for various consumer categories. The domestic consumers have the lowest connected load while the connected load is highest in Railway traction. The overall connected load per consumer has decreased from 1.36 kW to 1.32 kW over last one year. On the whole, the connected load appears to be low for all the consumer categories.

Table 6.8 Change in connected load per consumer

Category	As on 31st March 2004			As on 31st March 2005			%Growth in FY 2004-05 over FY 2003-04	
	No. of Consumers	Connected Load (MW)	Connected load per consumer (kW)	No. of Consumers	Connected Load (MW)	Connected load per consumer (kW)	No. of Consumers	Connected Load
Domestic	5752116	5964	1.04	6143228	6251	1.02	6.8%	4.8%
Commercial	1037624	1233	1.19	1124711	1318	1.17	8.4%	6.9%
Public Lighting	2325	84	36.13	2325	85	36.5	0.0%	1.2%
Irrigation	399044	722	1.81	412649	733	1.78	3.4%	1.5%
Industrial	108765	1809	16.6	116133	1839	15.8	6.8%	1.7%
HT non-industrial	191	48	251	217	51	235	13.6%	6.3%
Railway traction	4	25	6250	4	25	6250	0.0%	0.0%
Bulk Supply	9	26	2888	9	31	3444	0.0%	19.2%
Total	7300078	9910	1.36	7799276	10334	1.32	6.8%	4.3%

SOURCE: Tariff orders for various years issued by KSERC and ARR petition filed by KSEB for FY 2006-07

Status of rural electrification

Under the Rajiv Gandhi Grameen Vidhyutikaran Yojana (RGGVY) launched by Ministry of Power in April 2005, an amount of Rs.221.75 Crore has been sanctioned to Kerala. The scheme covers 14 districts. In the first phase seven districts i.e. Kasaragode, Kannur, Wayanad, Kozhikode, Malappuram, Idukki, and Palakkad shall be covered. Table 6.9 highlights the status of rural household electrification in Kerala. The

remaining 17.03 lakhs of unelectrified villages are to be covered under RGGVY.

Table 6.9 Rural Household Electrification

Total number of rural Households	Households having Electricity	% Electrified Households	Unelectrified Households	% Unelectrified Households
4942550	3238899	65.53	1703651	34.47

SOURCE: www.powermin.nic.in accessed during May-July 2006 and Kerala Economic Review 2005

The total number of villages in the state is 1364 with 100% electrification.

Efficiency improvement

Approach for fixing the loss reduction targets

For the purpose of analysing the level of losses and fixing the reduction targets, the Commission devised a format for energy balance to assess the losses occurring at each voltage levels. However, the Board was not able to furnish information due to inadequate metering. The Board also could not furnish any reason for considering a particular level of loss reduction for various years.

Accordingly, the Commission obtained actual data (up to December 2003) of the past year and used the same for fixing the loss level in FY 2003-04. Subsequently, for fixing the loss reduction targets in FY 2004-05, the KSERC has primarily followed the recommendation of the State Advisory Committee, which recommended a 3% loss reduction target from the loss levels in FY 2003-04. Table 6.10 shows the comparison of proposed, approved and actual T&D loss levels over the years.

Table 6.10 Comparison of proposed, approved and actual T&D losses

FY 2003-04			FY 2004-05			FY 2005-06		
Proposed	KSERC	Actual	Proposed	KSERC	Actual	Proposed	KSERC	Actual
26.50%	27.45%	28.46%	24.77%	24.45%	26.22%	22.59%	21.89%	24.84%

SOURCE: Tariff orders for various years issued by KSERC and ARR petition filed by KSEB for FY 2006-07

From the above it is evident that while Commission has been approving a certain loss level each year, the actual loss level has been much higher than the approved figures. Also, each year there has been no consideration of the actual losses in the state and the Commission has proceeded by its own level of loss reduction target. Further, there has been minimal actual loss reduction over the last three years.

In the tariff order for FY 2005-06, the Commission had directed the Board to complete the programme for installation of energy meters on distribution transformers by June 2005. It had also directed that the Board to complete the voltage level loss study and provide the results within two months of issue of the order. The Board however, has still not completed the same.

The Commission in tariff order for FY 2006-07 has reiterated the above directions and has also directed the Board to work out the losses in terms of aggregate technical and commercial losses (AT&C) rather than T&D losses¹. In addition, the Board has also been directed to submit a detailed investment plan with cost benefit analysis of measures aimed at reducing the losses.

Collection efficiency

As reported by the Board, its collection efficiency was 96% in FY 2003-04 and 92.19% in FY 2004-05. While the Board maintains reasonably good collection efficiency, there are concerns expressed by the Commission in recovery of dues from Government Departments, public sector units and dues withheld due to protracted litigation by private consumers.

In this context, the Commission had directed the Board to set up of Task Force for collecting outstanding dues. Accordingly, the KSEB had constituted a Task Force for arrear collection, which has submitted a detailed report on arrears. The report highlights consumer category-wise arrears pending for various years. Total arrears as indicated in the report are to the tune of Rs. 1398 Crore (as on 30th June 2006), equivalent to five months of revenue from sale of power by the KSEB. The KSEB has categorized all the dues in three categories – cases pending under litigation; cases referred to revenue recovery actions but pending recovery and cases pending with the Government and in the Board for decisions. Appropriate measures are being taken by the Board to expedite the recovery of dues in each of the above category.

Anti power theft squad

Recognizing the fact that losses have an important bearing on the financial health of the Board, KSEB has made earnest efforts to reduce the commercial losses. It has constituted an anti-theft squad in the Board headed by the Inspector General of Police, which is responsible for detection of thefts and recovery of revenue. The performance of anti-theft squad during 2001-02 to FY 2005-06 (up to October) is given in Table 6.11.

Table 6.11 Performance of the anti power theft squad

¹ In accordance the recommendations made in the meeting (on 12th May 2005) of the consultative committee of members of Parliament for the Ministry of Power

Year	No. of inspections	Amount assessed (Rs. Crore)	Amount realised (Rs. Crore)
2001-02	6215	5.69	3.45
2002-03	7888	17.48	3.82
FY 2003-04	14354	12.27	5.24
FY 2004-05	10287	40.46	8.11
FY 2005-06 (up to October)	7795	11.75	4.68

SOURCE Tariff petition filed by KSEB, FY 2006-07

The difference in the amount assessed and realized is on account of the option given to the consumers for paying the dues in instalments.

Metering

KSEB had also initiated replacement of faulty and sluggish electro mechanical meters by electronic meters and installation of transformer, feeder and border meters to determine the loss points. Table 6.12 highlights the number of faulty meters replaced over the last few years.

Table 6.12 Replacement of faulty meters

Year	Faulty meter replacements (Nos. in lakh)
FY 2002-03	4.21
FY 2003-04	8.67
FY 2004-05	4.35
FY 2005-06 (up to October)	4.20

SOURCE Tariff petition filed by KSEB, FY 2006-07

The Board has a target to replace 8.5 lakh faulty meters in FY 2005-06 and another 4 lakh in FY 2006-07.

Present status of metering

As on 31st March 2006, there is complete feeder and consumer metering in the state.

Fuel cost for Power Generation

Figure 6.8 shows the percentage of KSEB's own generation and power purchase in the total energy requirement of the state. As observed the dependence on the power purchase has been decreasing over the years with quantum of purchase decreasing over the last three years¹.

¹ The generation through hydro sources was low because of reduced inflows during June, July and August 2003 due to failure of monsoon during the period.

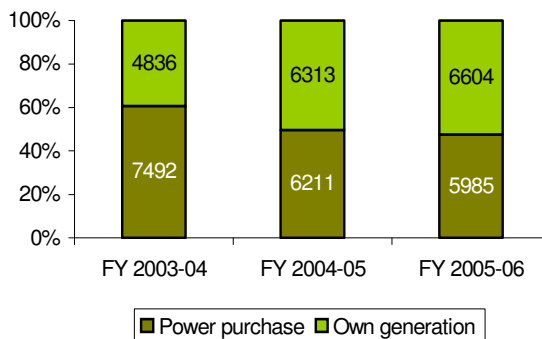


Fig 6.8 Share of power purchase and own generation in the total energy requirement

KSEB's own generation is primarily hydro resulting in a considerably low per unit cost of generation. The generation through its thermal plants viz. Brahamapuram Diesel Power Plant (BDPP) and Kozhikode Diesel Power Plant (KDPP) is low as the cost of generation is high. These plants are used in summers to meet the peak load requirement.

Table 6.13 shows the quantum, cost and per unit price of generation of KSEB owned power plants. As observed, per unit cost of generation has declined over the last three years.

Table 6.13 Fuel Cost generation from various sources

Plant	FY 2003-04			FY 2004-05			FY 2005-06		
	Unit MU	Cost Rs. Crore.	Avg price Rs./unit	Unit MU	Cost Rs. Crore.	Avg price Rs./unit	Unit MU	Cost Rs. Crore.	Avg price Rs./unit
Hydel	4314	13.22	0.03	6000	18	0.03	5	19.46	0.03
Wind- Kanjikode	2	0.41	2.05	3	0.6	2.00	3	0.62	2.07
BDPP	244	67.93	2.78	143	39.63	2.76	49	16.08	3.23
KDPP	276	71.76	2.60	167	42.3	2.53	67	19.7	2.90
Total	4836¹	153.3	0.32	6313	100.53	0.16	660	55.86	0.08

SOURCE Based on figures approved by the Commission

While the generation largely depends on the monsoons, the Commission in tariff order for FY 2003-04 suggested that the Board should adopt a major strategy that should aim at judicious operation of the major storage reservoirs by limiting generation to peak periods only, to the extent possible.

¹ The generation through hydro sources was low because of reduced inflows during June, July and August 2003 due to failure of monsoon during the period.

Table 6.14 below highlights the comparison of the units, cost and average price proposed and approved over the last three years.

Table 6.14 KSEB's own generation (Proposed Vs. Approved)

Year	Units (MU)		Cost (R. Crore)		Avg. Price (Rs /unit)	
	ARR	KSERC	ARR	KSERC	ARR	KSERC
FY 2003-04	4836	4836	153.3	153.3	0.32	0.32
FY 2004-05	5978	6314	149.0	100.5	0.25	0.16
FY 2005-06	6606	6606	55.9	55.9	0.08	0.085

SOURCE: Tariff orders for various years issued by KSERC

As observed, except in FY 2004-05 the Commission has approved the units and costs proposed by the Board. The overall cost of generation has been coming down over the years. The primary reason for the same is that last two years i.e. FY 2004-05 and FY 2005-06 were good monsoon years so that the generation was primarily through hydro sources with minimal use of diesel power stations. Generation from diesel stations was high in FY 2003-04 because of reduced inflows in June, July and August 2003 due to failure of monsoons during the period, which resulted in increased cost.

Power purchase cost

In addition to KSEB's own hydro, wind and thermal generation, it purchases power to meet the requirement in the state. The power purchase is primarily on account of allocation in the Central sector generating stations. As on 31st October 2005, KSEB had a total allocation of 1162 MW from CGS including the unallocated share (ARR filing 2006-07). Table 6.15 gives the details of the allocations.

Table 6.15 Allocations to Kerala from Central Sector Generating Companies

Power plant	Total capacity in	Firm allocation	Allocation including	Allocated capacity
	operation		unallocated share	to KSEB
	MW	%	%	MW
Talcher – II	2000	23.00	23.00	460
NLC II - Stage I	630	10.00	11.63	73
NTPC (RSPTS)	2100	11.70	14.74	310
NTPC (RSPTS New)	500	12.20	15.77	79
NLC – Expansion	420	14.00	18.53	78
NLC II – Stage II	840	10.70	12.32	103
MAPS	340	5.30	6.27	21
KAIGA	440	8.60	13.12	58
Eastern region (unallocated portion)	-	-		0
	7270			1182

SOURCE: ARR petition filed by KSEB for FY 2005-06 and FY 2006-07

In scheduling the generation and power purchase, KSEB strictly follows merit order principle. It also optimally utilizes its plants so that during monsoons all the run of the river plants and plants with minimum storage are operated at full capacity, so that spill can be avoided / minimized. Table 6.16 shows the comparison of the quantum and cost of power purchase as proposed and approved by the KSERC. As observed there has been no major variation between the figures proposed and those approved by the Commission.

Table 6.16 Comparison of cost of power purchase (Proposed Vs Approved)

Description	FY 2003-04	FY 2004-05	FY 2005-06
Unit (MU)			
ARR	7810	6210	6240
KSERC	7494	6210	5983
Cost of Power Purchase (Rs. Crore)			
ARR	1858	1729	1492
KSERC	1775	1605	1427
Average per unit cost (Rs. per unit)			
ARR	2.38	2.79	2.39
KSERC	2.37	2.58	2.39

SOURCE: Tariff orders for various years issued by KSERC

Table 6.17 highlights the source-wise power purchase for FY 2005-06

Table 6.17 Source-wise power purchase in FY 2005-06

Source	Energy	Fixed charges	Total	Total cost per unit
		plus incentives		
		Rs. Crore	Rs. Crore	Rs. Crore
BSES	0.00	124.26	124.26	
KPCL	0.00	18.24	18.24	
Central Share				
Ramagund (Old)	1905.63	83.20	252.41	1.32
Ramagundam(New)	453.72	47.56	87.85	1.94
MAPS	64.70	4.76	18.68	2.89
NLC – I	426.20	41.83	74.21	1.74
NLC – II	536.48	66.64	124.13	2.31
Kaiga	327.30	0.22	113.62	3.47
NLC (New)	346.02	24.64	59.21	1.71
Talcher – II	2151.15	200.03	303.77	1.41
UI	-228.07	0.00	-45.61	2.00
Total	5983.13	719.57	1238.96	2.07

SOURCE: Tariff orders for various years issued by KSERC (Approved figures for FY 2005-06)

It is important to highlight that KSEB at times can reduce its power purchase quantum, however it is liable to pay fixed charges to the CGS irrespective of availing full power allocation or not. In such cases, KSEB shall be beneficial only when UI rate or the sale rate to other states through traders is less than the variable cost of CGS power. The nuclear power stations are must run stations and the scheduled power from them cannot be surrendered.

Overall cost of power (weighted average of PPC and cost of own generation)

Table 6.18 highlights the weighted average cost of power including both the power purchase and KSEB's own generation.

Table 6.18 Weighted average of PPC and cost of own generation

Source	FY 2003-04		FY 2004-05		FY 2005-06	
	Units	Cost/unit	Units	Cost/unit	Units	Cost/unit
Own generation	4836	0.32	6313	0.16	6604	0.085
Power purchase	7492	2.37	6211	2.58	5985	2.39
Weighted average	12328	1.56	12524	1.36	12589	1.18

SOURCE: Tariff orders for various years issued by KSERC

As observed, the per unit cost of power has gone down from Rs. 1.56 in FY 2003-04 to Rs. 1.18 per unit in FY 2005-06 i.e. a 25% reduction. The primary reason for this has been decreased reliance on outside purchase in the last two years due to good monsoons in the state. The overall cost of power in Kerala is therefore one of the lowest in the country.

Trading and UI

From June 2005 onwards, KSEB has been exploring the possibility of selling the surplus power to other states at competitive rates through the power traders, with the approval of KSERC and the State Government. KSEB has been selling the surplus power through the central public sector undertakings such as NTPC Vidyut Vyapar Nigam Limited (NVVN) and Power Trading Corporation (PTC) from August 2005 onwards.

KSEB entered into agreement with NVVN and PTC for sale of off-peak power up to 300 MW at the rate of Rs. 2.72 per unit during July to September 2005 and sale of off-peak power up to 500 MW at Rs. 3.07 per unit in October 2005. During the month of November 2005 and December 2005, KSEB proposed to sell 400 MW of power at off-peak period at the rate of Rs. 3.05 per unit and 100 MW of power at peak hours at the rate of Rs. 3.70 per unit through NVVN and 100 MW of off-peak power through PTC at the rate of Rs. 3.07 per unit. Table 6.19 gives the actual sale during this period.

Table 6:19: Actual energy traded during FY 2004-05

Month	Off-peak sales			Peak sales		
	Energy (MU)	Rate (Rs./unit)	Amount (Rs. Crore)	Energy (MU)	Rate (Rs./unit)	Amount (Rs. Crore)
Aug-05	33.98	2.72	9.24	0.00	0.00	0.00
Sep-05	57.47	2.72	15.63	0.00	0.00	0.00
Oct-05	138.91	3.07	42.65	0.00	0.00	0.00
Nov-05 (up to 10 th November 05)	10.80	3.05	3.29	1.32	3.70	0.49
Nov-05 (11 th Nov to 30 th Nov 05)*	21.48	3.05	6.55	2.40	3.70	0.89
Dec-05*	33.4	3.05	10.21	3.72	3.70	1.38
Jan-05*	37.20	3.05	11.35	0.00	0.00	0.00
Total	333.32		98.92	7.44		2.25

SOURCE: ARR petition for FY 2006-07

*Provisional as per the petition. Actual was not available

Due to the transmission constraints, i.e., non-availability of transmission lines, the actual sale through NNVN and PTC has been much below the targeted sale. So KSEB was forced to export the balance power as Unscheduled Interchange (UI) power or temporary surrender part of the share of allocations from CGS. The details of UI are shown in Table 6.20.

Table 6:20 Energy imported / exported through Unscheduled Interchange

Month	UI Import			UI Export			Net UI export		
	Energy (MU)	Rate (Rs. Crore)	Amount (Rs. Crore)	Energy (MU)	Rate (Rs/ kWh)	Amount (Rs. Crore)	Energy (MU)	Rate (Rs/ kWh)	Amount (Rs. Crore)
Apr-05	28.98	2.02	5.86	11.59	2.96	3.44	(-) 17.39	1.39	(-) 2.43
May-05	5.55	1.93	1.07	69.34		30.65	63.79	4.64	29.58
Jun-05	14.29	2.49	3.55	24.37	3.09	7.53	10.08	3.95	3.98
Jul-05	0.98	1.4	0.14	111.77	2.04	22.78	110.79	2.04	22.64
Aug-05	10.52	1.22	1.29	44.65	1.4	6.24	34.13	1.45	4.96
Sep-05	2.27	0.93	0.21	154.82	0.76	11.7	152.55	0.75	11.49
Oct-05	3.24	0.38	0.12	97.37	1.07	10.9	94.12	1.09	10.78
Total	65.83	1.86	12.24	513.91	1.81	93.25	448.07	1.81	81

SOURCE: ARR petition for FY 2006-07

Operating expenses

Employee cost

In FY 2003-04, the KSERC approved the same employee cost as proposed by the KSEB, however on account of high value of several parameters viz. employee cost as a percentage of ARR (19% in FY 2003-04) and employee cost per unit of sale (78 paise per unit in FY 2003-04), the Commission had advised the Board to take all efforts to improve employee productivity. The actual employee cost in FY 2003-04 was on the higher side due to disbursement of DA arrears of Rs 42 Crores to the employees and Rs 17.2 Crores to the pensioners for the period from 1st July

2000 to 1st July 2003. On removing these disbursements, the employee cost per unit becomes 41 paise per unit.

In FY 2004-05, the KSEB projected an increase in terminal benefits from Rs. 343 Crore in FY 2003-04 to Rs. 375 Crore in FY 2004-05. This implied that the number of employees retiring during FY 2004-05 was higher than the previous year and accordingly, the total number of employees should reduce. The number of employees however has been increasing over the years. The Commission in the tariff order for FY 2004-05 pointed out lack of information on the part of KSEB in explaining such a trend. It also pointed out that the reason for such steep increase in the terminal benefits has not been clearly explained.

In addition to the above, the KSEB in its white paper on borrowings and debt servicing claims indicated that it has paid Rs. 20 Crore towards debt pension liability pertaining to previous year in FY 2003-04. On this, the Commission asked for certain details and explanation, which were not provided. Pending such explanations, the KSERC approved a growth rate of 3% towards salaries and 5% towards the terminal benefits (keeping the other benefits at same level of FY 2003-04) in FY 2004-05.

In FY 2005-06 too, the level of terminal benefits projected by the KSEB were of the order of 50% of the of the total employee cost. The Board submitted that although it has been making attempts to reduce the overall employee costs, the attempts got diluted due to revision of DA, reintroduction of encashment of earned leave etc in line with the Government decision. These have primarily been the reasons for increase in the employee cost over the last two years. In addition, the Board had made provision for leave surrender and increased the provision for terminal benefits owing to the retirement of 1262 employees in FY 2004-05 and 1142 in FY 2005-06.

The Commission indicated its concern over the rising employee cost and advised the Board to take long-term measures to improve the employee productivity as most of its measures were of short-term nature.

Table 6.21 and 6.22 show the break-up of the employee cost (proposed and approved) and comparison of proposed, approved and actual employee cost over the last three years. As it is evident, actual employee cost has exceeded both the proposed and approved expenses in each year. Also the increase approved by KSERC over last two years has been extremely high (21.9% increase from FY 2003-04 to FY 2005-06). The Board has always exceeded the Commission approved figures, which

either indicates lack of efforts from the KSEB or underestimation by KSERC.

Table 6.21 Break-up of employee cost over the years (Proposed vs. Approved)

Description	FY 2003-04		FY 2004-05		FY 2005-06	
	KSEB	KSERC	KSEB	KSERC	KSEB	KSERC
Salaries and wages	303.37	303.37	315.98	313	416.16	359.36
Holiday wages/overtime	0.13	0.13	0.14	0.13		
Earned leave encashment	25	25	23	23	23.32	23.33
Other allowances/bonus/benefits	21.34	21.34	22.19	21.34	19.79	19.79
Terminal benefits	343.8	343.8	375.33	361	480.17	443.43
Total	693.64	693.64	736.64	718.47	939.43	845.91

SOURCE: Tariff orders for various years issued by KSERC

Table 6.22 Comparison of employee cost - proposed, approved and actual over the years

Year	Proposed (Rs Crore.)	Approved (Rs Crore.)	Actual (Rs Crore.)
FY 2003-04	693.64	693.64	788.31
FY 2004-05	736.64	718.47	789.64
FY 2005-06	939.43	845.91	868.82*

SOURCE: Tariff orders for various years issued by KSERC and ARR Petition for FY 2005-06 and FY 2006-07

* Revised estimate

Employee productivity

As indicated in Figure 6.9, employee cost as a percentage of ARR has been increasing over the year indicating decrease in the employee productivity. This is further corroborated by observing the trend in employee cost per unit of sale, which has also been increasing over last three years.

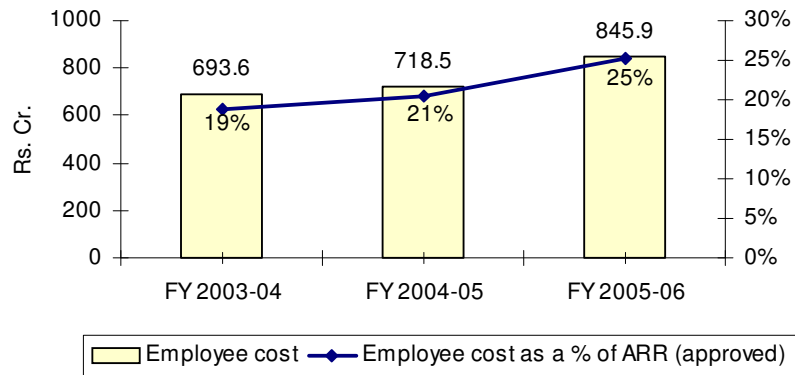


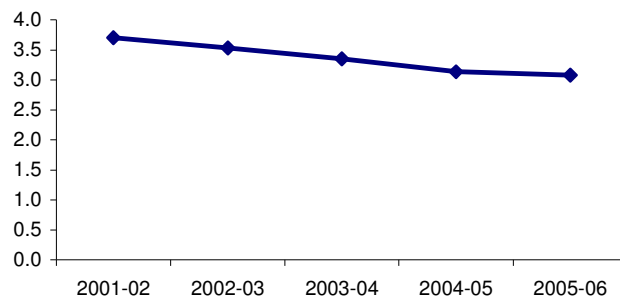
Figure 6.9 Employee cost as a percentage of ARR

Table 6.23 Employee cost per unit of sale

Year	Employee cost per unit of sales (Paise/unit)
FY 2003-04	77.93
FY 2004-05	77.25
FY 2005-06	86.03

SOURCE: TERI estimates

While the above figure indicates that employee productivity has been decreasing, another factor i.e. number of employees per thousand consumers indicates that the employee productivity is increasing. However, this may be on account of rapid increase in the number of consumers rather than rationalization of manpower by the KSEB.

**Figure 6.10** Number of employees per thousand consumers

SOURCE: TERI estimates

Another parameter that indicates the employee productivity is revenue generated per employee. Table 6.24 indicates the trend in the same over the years. As seen, the revenue per employee has been decreasing over the years signifying decrease in employee productivity.

Table 6.24 Revenue per employee over the years

Description	FY 2003-04	FY 2004-05	FY 2005-06
No. of Employees (Nos.)	24454	24454	25565
Revenue (Rs. Crore)	3698	3492	3367
Revenue per employee	0.15	0.14	0.13

Based on approved figures

SOURCE: TERI estimates

Repair and Maintenance expenses

In FY 2003-04, the Commission had approved R&M expenses equivalent to the amount proposed by the Board. However, while approving the same the Commission has examined the actual R&M expenditure, which was low in comparison to the total amount approved. The Commission, therefore, suggested the Board to accelerate its repair and maintenance plan so as to

improve the frequent power interruptions that were prevalent at that time.

In FY 2004-05, the Commission retained the provision of R&M expenses at the previous year's level. This was because the Board was not able to incur the earlier approved R&M expenses. The Commission also suggested that the provision for R&M should be based on detailed need based work programme. The Board, however exceeded the R&M expenses approved by the Commission and submitted that additional R&M could not take place due to lack of funds.

Cognizant of the concern of the Board, the Commission in FY 2005-06 approved an amount of Rs. 85.3 Crore equivalent to the amount projected by the Board in FY 2004-05. Table 6.25 gives the proposed, approved and actual R&M expenditure over the years.

Table 6.25 R&M expenses (Proposed, approved, actual) over the years

Year	Proposed Rs. Crore	Approved Rs. Crore	Actual Rs. Crore
FY 2003-04	66.7	66.7	63.8
FY 2004-05	85.3	66.7	74.5
FY 2005-06	89.1	85.3	89.1*

*Revised estimate

SOURCE: Tariff orders for various years issued by KSERC and ARR Petition for FY 2005-06 and FY 2006-07

Figure 6.11 highlights the R&M expenditure as a percentage of the opening gross fixed asset over the years (approved figures).

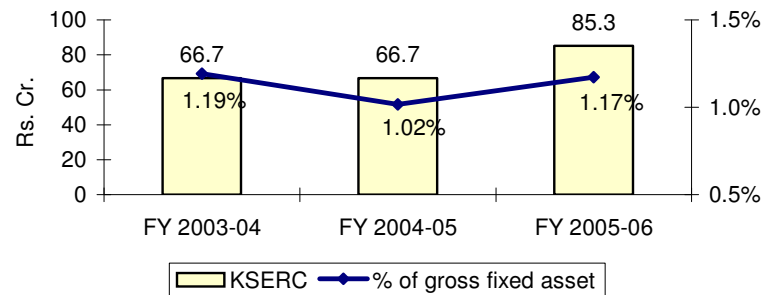


Figure 6.11 Repair & maintenance expenses as a percentage of gross fixed assets

The level of R&M expenses for KSEB ranges between 1 to 2% of the opening.

Administrative and General expenses (A&G expenses)

In FY 2003-04, the KSERC approved A&G expenses equivalent to that proposed by the KSEB. This was an increase of 8% over

the previous year. The Commission also suggested the Board to limit the growth in this item to 5% level.

In approving the A&G expenses for FY 2004-05, the Commission limited the expenditure proposed by the Board within the 5% range. Similarly, in FY 2005-06, the Commission has maintained its stand and limited the growth in A&G expenses (excluding electricity duty) to 5% level. Table 6.26 highlights the proposed, approved and actual A&G expenditure over the years.

Table 6.26 A&G expenses (Proposed, approved, actual) over the years

Year	Proposed (Rs Crore)	Approved (Rs Crore)	Actual (Rs Crore)
FY 2003-04	55.8	55.8	84.7
FY 2004-05	69.8	68.7	95.0*
FY 2005-06	98.3	90.7	99.4**

SOURCE: Tariff orders for various years issued by KSERC and ARR Petition for FY 2005-06 and FY 2006-07

* As per provisional accounts

** Revised estimate (as per ARR submission 2006-07)

On analysing the break-up of A&G expenses it is observed that electricity duty under section 3(1) the Kerala Electricity Duty Act, 1963 is considered as part of A&G expenses.

It is important to note that while electricity duty is a revenue item and should form part of revenue receipts by the Board, in the ARR it is merged along with the A&G expenses which is an expenditure item. This therefore increases the overall A&G expenses by KSEB. Table 6.27 gives the actual A&G expenses by KSEB excluding the electricity duty (actual) over the years.

Table 6.27 Electricity Duty as per sec 3(1) of the KED Act, 1963

Year	Electricity Duty @ 6 paise / unit (Actual)	A&G expenses excluding electricity duty (Actual)
	Rs. Crore	Rs. Crore.
FY 2000-01	33.1	46.0
FY 2001-02	28.3	38.0
FY 2002-03	21.4	30.3
FY 2003-04	51.5	33.2
FY 2004-05	54.9	35.4
FY 2005-06	58.6	39.9

SOURCE: Tariff orders for various years issued by KSERC and ARR Petition for FY 2005-06 and FY 2006-07

Figure 6.12 highlights the A&G expenses as a percentage of sales and as a percentage of total ARR. As observed, although the A&G expenses per unit of sale are within the acceptable range it has been increasing over the years highlighting decline in productivity. Similarly, A&G expenses as a percentage of total ARR has also been increasing.

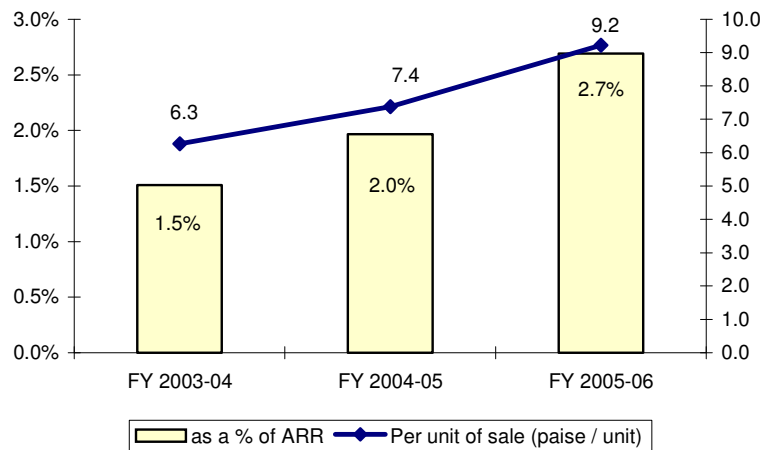


Figure 6.12 A&G expenses as a percentage of ARR and per unit of sale

Total operating expenditure (employee cost, R&M and A&G expenses)

Table 6.28 highlights the operating expenditure that primarily includes employee cost, repair and maintenance expenses and administration and general expenses over the years.

Table 6.28 Operating expenditure over the years

Year	Proposed Rs. Crore	Approved Rs. Crore	Actual Rs. Crore	Per unit of sale* Paise/unit	As a % of ARR* %
FY 2003-04	816.1	816.1	936.8	91.7	22.1%
FY 2004-05	891.7	853.9	959.1	91.8	24.4%
FY 2005-06	1126.8	1021.9	1057.4	103.9	30.3%

*Based on approved figures

SOURCE: Tariff orders for various years issued by KSERC and ARR Petition for FY 2005-06 and FY 2006-07

As observed the O&M expenses per unit of sales and as a percentage of total ARR has been increasing over the years indicating a marginal decline in productivity.

Sources of funds

As already stated above, the Board was under a debt trap during FY 2002-03, and ever since the efforts of the Commission have been to improve the financial condition of the Board. Table 6.29 shows the outstanding loan liabilities of the Board for various years.

Table 6.29 Outstanding loan liabilities (Actuals)

Year	Loan outstanding	Loan received	Total	Principal repayment during the year	Closing balance
FY 1999-00	3027.49	849.73	3877.22	326.13	3551.10
FY 2000-01	3551.10	1303.56	4854.66	283.26	4571.41
FY 2001-02	4571.41	690.31	5261.72	489.82	4771.90
FY 2002-03	4771.90	1380.24	6152.14	1057.99	5094.15
FY 2003-04	5094.15	2013.40	7107.55	1751.90	5355.64
FY 2004-05	5355.65	582.16	5937.81	1396.48	4541.33
FY 2005-06*	4541.33	511.43	5052.76	1140.93	3911.83

*Revised estimate

SOURCE ARR tariff petition, 2006-07

However, in each of its order the Commission had directed the Board to make efforts to swap the high cost loans so as to bring down the total debt liability. Several efforts have been made by the Board to improve its financial performance. These include swapping of high cost loans, reduction in outstanding loans, fresh borrowings from least cost sources and reduction in cost of raising finance by way of dispensing with Government guarantee, upfront payments, commitment charges etc, the Board has substantially reduced the interest burden. These efforts have resulted in a total saving of Rs. 37.43 Crore over last three years. Table 6.30 presents the details of swapping of high cost loans over the years.

Table 6.30 Details of swapping of high cost loans

ERC filing for FY 2006-07

SOURCE ARR and ERC filing for FY 2006-07

Year	Item	Amount (Rs. Crore)	Before swapping		After swapping		Premium paid (Rs. Crore.)	Net savings (Rs. Crore.)	Annual net savings (Rs. Crore.)
			Interest (%)	Amt (Rs. Crore.)	Interest (%)	Amt (Rs. Crore.)			
FY 2003-04	Non SLR Bond VI	300.00	15.25	187.58	7.50	54.74	Nil	132.84	26.57
	REC I Stage	649.43	13-15	278.95	10.50	226.89	20.21	31.85	3.98
	REC II stage	118.97	13	39.97	10.00	29.36	2.96	7.65	0.85
	LIC	187.41	14	102.98	11.00	80.91	7.8	14.27	1.10
	PFC at I stage	100.00	15-17	67.26	8.5-10	49.98	8.55	8.73	0.97
	PFC at II stage`	18.13	13.5-15	7.21	8.50	5.74	0.94	0.53	0.08
	Loan taken for KDPP	125.00	13.75	48.35	11.25	25.47		22.88	2.29
<i>Total</i>	<i>1498.94</i>		<i>732.3</i>		<i>473.09</i>	<i>40.46</i>	<i>218.75</i>	<i>35.84</i>	
FY 2004-05	Non SLR Bond IX-call option	6.48	13.25	2.22	6.50	1.09	Nil	1.13	0.37
	REC short-term loan	48.77	9.75	3.23	6.50	1.71	0.42	1.10	1.10
	<i>Total</i>	<i>55.25</i>		<i>5.45</i>		<i>2.80</i>	<i>0.42</i>	<i>2.23</i>	<i>1.47</i>
FY 2005-06	Non SLR Bond IX-call option	1.63	13.75	0.22	6.20	0.10	Nil	0.12	0.12
	<i>Total</i>	<i>1.63</i>		<i>0.22</i>		<i>0.10</i>		<i>0.12</i>	<i>0.12</i>
Grand Total		1555.82		737.97		475.99	40.88	221.10	37.43

Status of PFC lending

Table 6.31 indicates the status of PFC lending in the state of Kerala.

Table 6.31 Status of PFC lending

Description	Total sanctions	Total disbursements (Rs.
	(Rs. Crore)	Crore)
BSES Kerala Power	99.93	99.93
KSERC	0.070	0.070
KSEB	556.07	516.65

SOURCE Power Line, Volume 11, No. 2, October 2006

Status of APDRP schemes

The Board has stated the following projects with a total outlay of Rs. 905.01 Crore under the APDRP for improvement of sub transmission and sub distribution network.

Table 6.32 Details of APDRP Schemes

Scheme	Year of sanction	Project cost (Rs. Crore)	Target date of completion
3 Circle scheme	26 th August 2002	181.59	December 2005
7 Town scheme	27 th November 2002	168.76	March 2006
26 Town scheme	1 st October 2004	123.91	March 2006
13 Town scheme	4 th April 2005	57.18	March 2007
3 city improvement scheme	4 th April 2005	373.57	March 2008
Total		905.01	

SOURCE: ARR and ERC filing for FY 2006-07

The schemes inter alia cover installation of energy meters, construction and re-conductoring of 11 kV lines, installation of 100 kVA transformers, computerization of billing etc so as to reduce T&D loss, facilitate new service connections and accounting of energy. Under the schemes, Government of India provides 25 % of the project cost of these schemes as grants, besides giving incentive for reduction of revenue deficit of the Board.

Capital expenditure

Table 6.33 highlights the details of actual capital expenditure vis-à-vis the expenditure approved by the Commission.

Table 6.33 Capital expenditure by KSEB (Actual vs. Approved)
(Rs. Crore)

(Rs.

Description	FY 2003-04		FY 2004-05		FY 2005-06	
	KSERC	Actual	KSERC	Actual	KSERC	Actual*
Capital works in progress	1502.90	1502.90	1267.27	1343.48	1351.49	1303.98
Works transferred to gross block	924.28	968.51	707.84	501.42	905.68	543.03
Capital expenditure	350.00	621.93	260.74	357.00	695.78	554.35
Interest capitalized	115.45	78.11	115.73	62.04	98.36	54.97
Other expense capitalized	119.80	109.05	123.53	42.88	159.17	40.68
Total capital expenditure	585.25	809.09	500.00	461.92	953.31	650.00
Closing balance	1163.87	1343.48	1059.43	1303.98	1399.12	1410.95

*Revised estimate

SOURCE: Tariff orders for various years issued by KSERC and ARR Petition for FY 2005-06 and FY 2006-07

As stated in the tariff order, during validation sessions held between the Commission and the Board as part of the determination of ARR and tariff for KSEB, the Board stated that while preparing the capital expenditure, the State's overall capital expenditure plan has to be taken into consideration and in actual practice, higher provisions made in the budget may not materialize. This is the reason for difference in actual and projected expenditure is mainly due to this. The Board was also asked to provide the Commission with the progress of implementation of capital projects on quarterly basis. The Commission in its tariff orders have given various directives from time to time to improve the physical and financial progress of the capital works programme.

Provision for bad debts and prior period expenses

In FY 2003-04, the Commission approved an amount of Rs. 76.28 Crore towards other expenses comprising Rs. 58.87 Crore of prior period expenses and Rs. 17.41 Crore of bad debts. For approving the prior period expenses the Commission examined the annual accounts for FY 2002-03 and restricted the amount to the actual of that year. As regards, the provision for bad debts the Commission allowed only 2% of the outstanding amount as bad debts and directed the Board to take immediate steps to identify bad debts and furnish full information on the write-offs in respect of this item.

In FY 2004-05, the Commission disallowed the provision of bad debts in absence of any information submitted by the Board. It was of the view that inefficiency of the Board could not be passed on the paying group of consumers and hence no such provision should be allowed. As regards the prior period expenses the Commission allowed an amount of Rs. 50 Crore for FY 2004-05.

In FY 2005-06, the KSEB proposed a prior period expense of Rs. 120.85 Crore towards employee cost, in anticipation of wage revision with retrospective effect. The Commission disapproved the same stating that it would not be right to charge the consumers on account of an expense, which is not incurred. Further, the Commission had already approved the employee cost and any revision in the same shall be subject to regulatory scrutiny. The Commission in absence of detailed information therefore did not allow any prior period expense. As regards, bad debts, the Commission asked the Board to submit age wise analysis of arrears and a feasible plan for recovery of arrears in a time bound manner. After analysing the details submitted by the Board, the KSERC allowed an expense of Rs. 50 Crore. Alongside, it directed the Board that this expense should not exceed Rs. 50 Crore for FY 2005-06. Table 6.34 shows a

comparison of proposed and approved prior period expenses and bad debts.

Table 6:34 Prior Period expenses over the years (proposed vs. approved)

Description	FY 2003-04		FY 2004-05		FY 2005-06	
	Proposed Rs. Crore	Approved Rs. Crore	Proposed Rs. Crore	Approved Rs. Crore	Proposed Rs. Crore	Approved Rs. Crore
Prior period charges	66.47	58.87	86.42	50	120	-
Provision for bad debts	43.53	17.41	43.58	0	24.2	-
<i>Total (other expenses)</i>	110	76.28	130	50	144.2	50*

* A total of Rs. 50 Crore was approved in FY 2005-06

SOURCE: Tariff orders for various years issued by KSERC and ARR Petition for FY 2005-06 and FY 2006-07

Rate of return

In FY 2003-04, KSEB proposed an amount of Rs. 91.83 Crore as return on capital base and the Commission approved the same. In FY 2004-05, the KSEB proposed return on equity equal to Rs. 155.3 Crore equivalent 10% rate of return on the equity base of Rs. 1553 Crore. The Commission however, stated that the Board has neither started functioning on commercial lines nor improved its efficiency in vital areas and has been depending on the subsidy support from the Government. It therefore allowed a statutory return of 3% on the capital based as at the beginning of the year. This amounted to Rs. 105 Crore.

In the past, State Governments had been providing guarantees for the loans availed by the Board. However, as part of fiscal reforms, the Government of India introduced guarantee capping by legislation. Accordingly, the State Government vide letter GO (MS) 99/2004/Fin dated 25th February 2004 decided to freeze the guarantee provided to the Board as on 31st December 2003 and directed the Board to negotiate all future loans without Government guarantee. The amount of guarantee that can be given by Government of Kerala was capped at Rs. 14, 000 Crore.

In FY 2005-06, KSEB proposed a return on equity of 14% amounting to Rs. 217.42 Crore. The return proposed by the Board was in line with the KSERC (terms and condition for determination of tariff) regulations and hence, was allowed by the Commission.

Table 6.35 Rate of return (Proposed vs. approved)

FY 2003-04		FY 2004-05		FY 2005-06	
Proposed	Approved	Proposed	Approved	Proposed	Approved
91.83	91.83	155.3	105.0	217.4	217.4
Basis – 3% Return on capital base		Basis for proposed amount was 10% on equity based and basis for approved amount – 3% Return on capital base		Basis – 14% Return on equity	

SOURCE: Tariff orders for various years issued by KSERC

Depreciation

In FY 2003-04, the Commission approved depreciation equivalent to that proposed by the Board. However, the Commission indicated that depreciation for some items like plant and machinery, lines and cables was on the higher side.

In FY 2004-05 too, the Commission approved depreciation amount as proposed by the Board. In doing so, the Commission again remarked that the depreciation rates for some items was on the higher side, however it allowed the same because of huge debt burden of KSEB at that time.

In FY 2005-06, the KSEB proposed a depreciation amount of Rs. 430.35 Crore at a weighted average depreciation rate of 5.92%. This was based on the provision of the Electricity (Supply) Act 1948. The Commission however stated that, as per Section 61 of the Electricity Act 2003, the terms and conditions of determination of tariff under the Electricity (Supply) Act 1948, and Electricity Regulatory Commissions Act, 1998 shall be continued to be apply for a period of maximum one years, hence the provisions under the repealed laws are no longer valid.

As per the Sect 61(a) of the Electricity Act 2003, while specifying the terms and conditions of tariff, the Commission shall be guided by the principles and methodologies specified by the CERC for the determination of tariff applicable to generating companies and transmission licensees. Since, the asset classification in the depreciation schedule specified by the CERC is same as that followed by the KSEB, the KSERC had used this as a basis for specifying depreciation rates for FY 2005-06, which form a part of the regulations notified by KSERC on terms and conditions on determination of tariff for distribution licensees. In addition, during the ARR filing, the KSERC has asked the KSEB to submit revised estimates for depreciation based on the rates specified in its regulations. This was however, not submitted by the Board and hence Commission decided to proceed with the information available at that point of time. Table 6.36 gives the details of the weighted

average depreciation rates (proposed and approved) in FY 2003-04, FY 2004-05 and FY 2005-06.

Table 6.36 Weighted average depreciation rates (proposed and approved) over the years

Description	FY 2003-04				FY 2004-05				FY 2005-06			
	Proposed		Approved		Proposed		Approved		Proposed		Approved	
	Rate (%)	Amount (Rs. Crore.)	Rate (%)	Amount (Rs. Crore.)	Rate (%)	Amount (Rs. Crore.)	Rate (%)	Amount (Rs. Crore.)	Rate (%)	Amount (Rs. Crore.)	Rate (%)	Amount (Rs. Crore.)
Buildings	4.36	14.79	4.36	14.79	3.8	14.47	3.8	14.47	3.7	15.31	2.57	10.63
Hydraulic Works	2.34	15.98	2.34	15.98	2.59	18.85	2.59	18.85	2.6	19.29	1.8	13.46
Other Civil Works	2.39	2.38	2.39	2.38	2.63	3.67	2.63	3.67	2.6	4.76	2.57	4.75
Plant & Machinery	6.63	171.87	6.63	171.87	6.71	182.24	6.71	182.24	6.9	199.11	3.6	103.14
Lines, cables, Network etc.	6.79	128.32	6.79	128.32	6.89	160.59	6.89	160.59	6.7	189.34	3.6	101.45
Vehicles	1.73	0.2	1.73	0.2	2.05	0.24	2.05	0.24	0.6	0.07	6	0.68
Furniture and Fixtures	0.85	0.08	0.85	0.08	12.46	1.34	12.46	1.34	9.9	1.13	6	0.69
Office Equipments	10.61	0.9	10.6	0.9	10.08	0.87	10.08	0.87	9.4	1.33	6	0.85
Total	5.98%	334.52	5.98%	334.52	5.83%	382.27	5.83%	382.27	3.24%	430.35	3.24%	235.65

SOURCE: Tariff orders for various years issued by KSERC

Table 6.37 shows a comparison of proposed, approved and actual amount of depreciation charged each year.

Table 6.37 Proposed, approved and actual amount against depreciation

Year	Proposed (Rs Crore)	Approved (Rs Crore)	Actual (Rs Crore)	Weighted avg. depreciation rate (Approved figures) %	Basis for estimation
FY 2003-04	334.52	334.52	326.19	5.98%	ESA 1948
FY 2004-05	382.27	382.27	374.77	5.83%	ESA 1948
FY 2005-06	430.35	235.65	392.65	3.24%	KSERC regulations – rates based on CERC guidelines

SOURCE: Tariff orders for various years issued by KSERC and ARR Petition for FY 2005-06 and FY 2006-07

Annual Revenue Requirement (ARR)

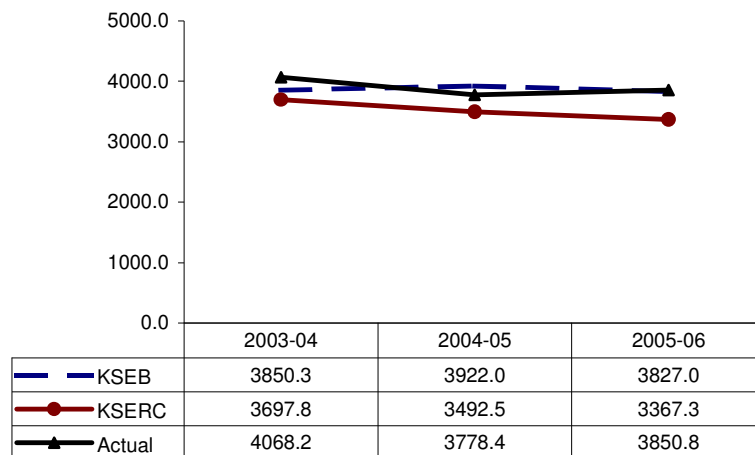
Table 6.38 shows a comparison of elements of ARR (proposed, approved and actual) over the last three years.

Table 6.38 Comparison of proposed, approved and actual ARR over the last three years
(All figures in Rs. Crores)

Particulars	FY 2003-04			FY 2004-05			FY 2005-06		
	KSEB	KSERC	Actual	<i>KSEB</i>	KSERC	Actual	KSEB	KSERC	Actual
Generation of Power	153.3	153.3	143.7	149.0	100.5	119.6	55.9	55.9	48.9
Purchase of power	1858.1	1775.1	1887.1	1729.7	1605.0	1549.3	1492.8	1427.3	1512.1
Interest & Finance charges	721.5	679.3	726.3	723.3	618.3	658.4	617.7	583.6	566.5
Depreciation	334.5	334.5	326.2	382.3	382.3	382.3	430.4	235.7	392.7
Employee cost	693.6	693.6	788.3	736.6	718.5	864.3	939.4	845.9	868.8
R & M	66.7	66.7	63.8	85.3	66.7	85.3	89.1	85.3	89.1
A & G	55.9	55.9	84.7	69.8	68.7	90.6	98.3	90.7	99.5
Other expenses	110.0	76.3	143.4	130.0	50.0	123.7	144.2	50.0	151.5
Gross expenditure	3993.7	3834.7	4163.5	4006.0	3610.0	3873.4	3867.7	3374.3	3729.0
Less: Expenses Capitalized	119.8	119.8	109.1	123.5	123.5	146.3	159.0	138.8	40.7
Less: Interest Capitalized	115.5	108.9	78.1	115.7	99.0	104.1	99.2	85.6	55.0
Net Expenditure	3758.5	3606.0	3976.4	3766.7	3387.5	3623.1	3609.6	3149.9	3633.4
Statutory Return	91.8	91.8	91.8	155.3	105.0	155.3	217.4	217.4	217.4
ARR	3850.3	3697.8	4068.2	3922.0	3492.5	3778.4	3827.0	3367.3	3850.8
Less: Non-tariff income	240.4	240.4	304.7	231.2	231.0	231.2	259.0	269.5	293.3
Less: Revenue from Tariff	2683.9	2901.0	2756.1	2836.7	2965.0	2883.6	3075.7	3046.5	3248.0
Total Income	2924.2	3141.4	3060.8	3067.8	3196.0	3114.8	3334.7	3316.0	3541.3
Revenue Gap	926.1	556.5	1007.4	854.2	296.5	663.5	492.3	51.3	309.5

SOURCE: Tariff orders for various years issued by KSERC and ARR Petition for FY 2005-06 and FY 2006-07

As observed, in each year the approved ARR has been less than the ARR proposed and in each year the expenditure has exceeded the approved amount.

**Figure 6.13** Trend in ARR (Proposed, approved and actual)

Other performance parameters

HT-LT ratio and Number of distribution transformers

Figure 6.14 highlights the HT: LT ratio and number of distribution transformers in the state of Kerala. As observed, while the number of distribution transformers have been increasing in the state the HT: LT ratio in the state has declined over the years. This may be one of the factors towards delay in loss reduction by the Board.

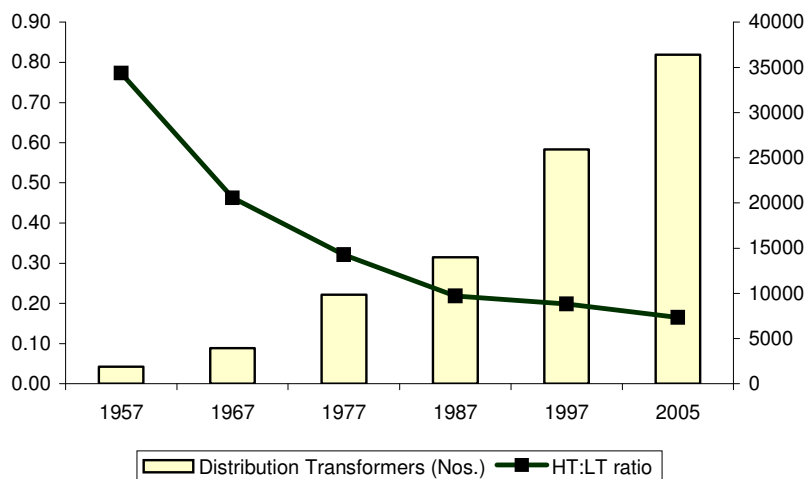


Figure 6.14 No of distribution transformers and HT: LT ratio over the years

SOURCE: ARR Petition for FY 2005-06 and FY 2006-07

Tariff Rebalancing

Tariff rationalization

In tariff order for FY 2003-04, the Commission had directed the Board to furnish the details regarding the cost of service to various categories of consumers, so as to enable the Commission to work out the extent of cross subsidy in the tariff structure. The KSEB was not able to submit the data requested by the Commission.

Despite the limited data available, the Commission by itself initiated an exercise to determine the cost of supply to various categories in FY 2004-05. Annual accounts for FY 2000-01, FY 2001-02, ARR for FY 2004-05 and feeder-metering study conducted by KSEB research section¹ in 1999 were used to calculate the cost of supply. While there were arbitrariness in

¹ For calculating the coincident demand and non-coincident demand for each consumer category

the above analysis due to lack of accurate and reliable data, the study indicated that cross subsidies provided by the subsidizing categories vary from 118% to 159%. The Commission also expressed its concern over the declining HT and EHT consumption due to high level of cross subsidy.

The Commission, therefore, directed the Board to undertake the above study and make the requisite information available to the Commission. It was of the view that any tariff rationalization exercise should be based on a detailed cost to serve study. In accordance with the above, there has been no tariff revision in the state since October 2002¹. Each year the revenue gap has been adjusted against the subsidy to be received from the Government and plea of the KSEB to retain the electricity duty collected by them. During the meetings held with KSERC on 1st and 2nd November 2006, the issue of tariff rationalization was discussed in detail. The Commission highlighted that the Board had been under huge debt burden, which was steadily increasing. As on 31st October 2003 the outstanding debt of the Board stood at Rs.5043 Crore against the net fixed assets of Rs.6100 Crore². Thus, the main consideration of the Commission over the years had been to improve the fiscal situation of the KSEB and to undertake a detailed study to estimate cost to serve to each consumer category³. Consequently, no tariff rationalization exercise was attempted and the tariffs have not been revised since October 2002.

As a result of the above, and other measures like reduction of losses, swapping of loans, restricted borrowings etc. the situation of KSEB has been improving. The Commission during the meeting with TERI team expressed its intent to undertake tariff rationalization and move towards a multi-year tariff framework from FY 2007-08 onwards.

New initiatives in tariff design

Promotion of renewables

In view of the huge potential that exists in the state for generation through non-conventional energy sources, the KSERC has notified regulations on “power procurement from renewable sources by distribution licensee” on 4th July 2006.

¹ It is only on 20th January 2006 that tariff for LT-1 Domestic and LT- VII (A) and (B) Commercial consumers was reduced by 20 paise

² Tariff Order for FY 2003-04

³ As submitted by the Board, it has already taken steps to collect the data required for conducting the cost of service. Due to delay in processing the same by the Board, the Commission has itself initiated a study for “determination of sample load curves for different category of consumers in KSEB system and estimation of typical energy losses at different voltage level”. The study has been commissioned to Central Power Research Institute. The study is to be completed by November 2006.

Due consultation with all stakeholders was undertaken by the Commission before the finalization of these regulations. Some of the important provisions of these regulations are given below.

- Each distribution licensee is to purchase a quantum of 5% from renewable sources expressed as a percentage of its total consumption during a year. The break up of the 5% is 2% from small hydro, 2% from wind and 1% from other sources such as solar, biomass, urban/municipal waste etc.
- The buyers shall indicate the proposed quantum of purchase from renewable sources for the ensuring year in the ARR and ERC (Expected Revenue from Charges) filing
- The buyers shall provide adequate payment security mechanism for the purchase of such power
- The Commission may review the quantum of such purchases once in 3 years

Another important provision of these regulations is that mandatory open access to the Licensee's transmission system and/or distribution system shall be provided to any person generation electricity through renewable sources.

The regulations also detail out the process and the norms to be adopted by the Commission for determination of tariff for renewable energy projects. It also specifies the levelized tariff for small hydro as Rs. 2.44 per unit (for 25 years) and wind as Rs. 3.14 per unit for 20 years.

Initiatives towards demand side management

Demand side management becomes of immense important in a state like Kerala where there is huge difference in the magnitude of peak and off-peak demand. Accordingly, time of day tariff for HT and EHT consumers has been there since 2002. The KSERC vide its order dated 14th January 2005¹ further incentivized the consumer to promote usage of power during off-peak periods. As per the order licensee was directed to work out the savings as well as the revenue shortfall prior to implementation and after the implementation of the incentives indicated in the order and report the same quarterly to the Commission.

¹ The order adopted following modifications in respect of differential pricing method

- i. The maximum permissible demand during the off-peak hours shall be allowed up to 120% of the contract demand in place for the prevailing limit of 105% of the contract demand and incentives for the demand charges shall be worked out on that basis
- ii. For working out the incentives for energy charge, the off-peak consumption in excess of 27.5% of the total consumption shall be taken, instead of the present level of 30%
- iii. The rate of incentive for energy charge shall be 35% instead of the present level of 25%

In the same order, the Commission also detailed out the incentives and penalties¹ that shall be applicable to the HT and EHT categories for power factor above 0.9 and below 0.9 respectively.

As per the discussions with the KSERC, it is now considering extending such features to other consumer categories as well including the domestic category. Sample study is also being undertaken on the use of CFL and its harmonic impacts by the KSEB. Once the results of the same are available appropriate strategies to promote the use of energy efficient appliances shall be undertaken.

Energy Management Centre, an autonomous Centre operating under the Department of Power, Government of Kerala has been designated as the Government Organization to enforce the provisions of Energy Conservation Act 2001. The objectives of the Centre are to facilitate efficient management of all forms of energy, to promote energy efficiency and energy conservation and to develop new sources of energy as well as novel energy technologies with a view to increasing production, improving the quality of life and facilitating the use of energy on a sustainable basis.

Category-wise average tariff

Table 6.39 shows the average realization from tariffs for FY 2003-04, FY 2004-05 and FY 2005-06. It indicates the average realization and sales for various consumers at LT, HT and EHT level.

Table 6.39 Category-wise average tariff in FY 2003-04, FY 2004-05 and FY 2005-06

Category	FY 2003-04			FY 2004-05			FY 2005-06		
	Sales	Revenue	Average	Sales	Revenue	Average	Sales	Revenue	Average
	MU	Rs. Crore	Rs./unit	MU	Rs. Crore	Rs./unit	MU	Rs. Crore	Rs./unit
LT									
Domestic	3927	642	1.63	4125	758	1.84	4540	804	1.77
Industrial	748	316	4.23	795	321	4.04	873	352	4.03
Non Domestic	863	625	7.24	920	661	7.18	974	656	6.73
Agricultural	196	20	1.01	196	17	0.87	202	18	0.92
Street lighting	167	27	1.64	177	35	1.98	188	32	1.70
Others*		25							
<i>Sub total LT</i>	<i>5901</i>	<i>1655</i>	<i>2.80</i>	<i>6213</i>	<i>1792</i>	<i>2.88</i>	<i>6777</i>	<i>1863</i>	<i>2.75</i>
HT									
Industrial	1185	518	4.37	1185	474	4	1241	493	3.97
Non industrial	127	44	3.45	137	57	4.16	150	67	4.45
Commercial	297	107	3.60	352	150	4.26	8	3	3.90
Agricultural	8	1	1.13	8	3	3.75	368	168	4.55
<i>Sub total HT</i>	<i>1617</i>	<i>670</i>	<i>4.14</i>	<i>1682</i>	<i>684</i>	<i>4.07</i>	<i>1767</i>	<i>730</i>	<i>4.13</i>
EHT									

¹ Incentive of 0.15% of energy charge for each 0.01 unit increase in power factor from 0.9 and penalty of 1% energy charge for every fall from 0.9 p.f.

Category	FY 2003-04			FY 2004-05			FY 2005-06		
	Sales	Revenue	Average realization	Sales	Revenue	Average realization	Sales	Revenue	Average realization
	MU	Rs. Crore	Rs./unit	MU	Rs. Crore	Rs./unit	MU	Rs. Crore	Rs./unit
66kV	290	119	4.12	291	112	3.85	267	100	3.76
100kV	839	381	4.54	839	295	3.52	765	276	3.61
<i>Sub total EHT</i>	<i>1129</i>	<i>501</i>	<i>4.43</i>	<i>1130</i>	<i>407</i>	<i>3.60</i>	<i>1032</i>	<i>377</i>	<i>3.65</i>
Railways	50	18	3.62	60	22	3.67	56	20	3.65
Bulk supply	196	58	2.94	207	60	2.90	200	57	2.83
Total**	8893	2901	3.26	9292	2965	3.19	9832	3046	3.10

*Other include temporary connection and irrigation & dewatering

**Unit corresponding to NPG group (8 MU) have not been included, as they have no revenue impact

SOURCE: Tariff orders for various years issued by KSERC and ARR Petition for FY 2005-06 and FY 2006-07

As observed from the Table 6.39, the average realization from various categories has broadly remained constant. However, one striking feature that is demonstrated from the above trends is that the average realization from commercial consumers is extremely high of the order of Rs. 7.00 per unit. Figure 6.15 highlights the trend in tariff for selected consumer categories at the LT level.

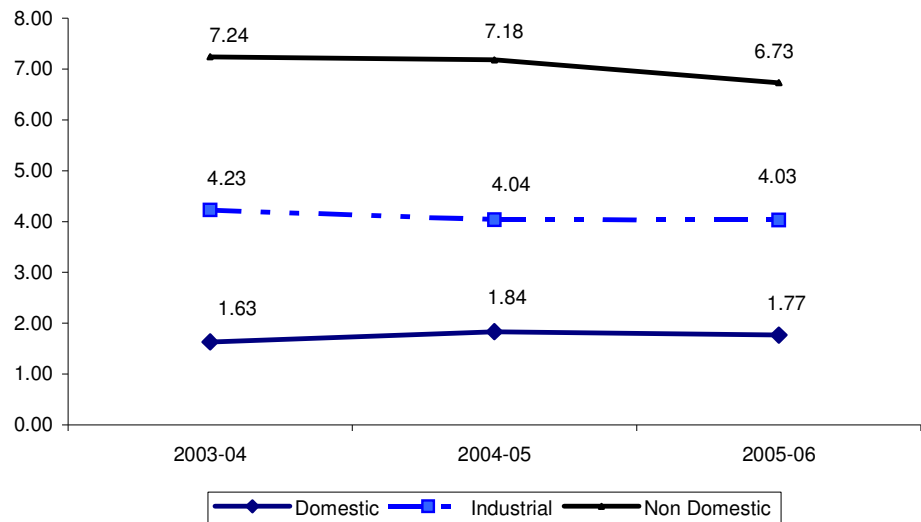


Figure 6.15 Tariff trends for consumer categories at LT level

Cross subsidy

The Commission in its orders has recognised the need for reduction of cross-subsidy and hence tariff rationalization. However, as already state above due to high debt burden of KSEB and due non-availability of requisite data for accurate estimation of the level of cross-subsidy, no tariff rationalization has been undertaken in the state till date.

Table 6.40 Changes in cost recovery for various consumer categories for FY 2003-04, FY 2004-05 and FY 2005-06

Category	FY 2003-04			FY 2004-05			FY 2005-06		
	Average realization	Average Cost	AR/AC	Average realization	Average Cost	AR/AC	Average realization	Average Cost	AR/AC
	Rs./unit	Rs./unit	Rs./unit	Rs./unit	Rs./unit	Rs./unit	Rs./unit	Rs./unit	Rs./unit
LT									
Domestic	1.63	3.89	42%	1.84	3.51	52%	1.77	3.15	56%
Industrial	4.23	3.89	109%	7.18	3.51	205%	4.03	3.15	128%
Agricultural	1.01	3.89	26%	4.04	3.51	115%	0.92	3.15	29%
Non Domestic	7.24	3.89	186%	0.87	3.51	25%	6.73	3.15	214%
Street lighting	1.64	3.89	42%	1.98	3.51	56%	1.7	3.15	54%
Sub total LT	2.8	3.89	72%	2.88	3.51	82%	2.75	3.15	87%
HT									
Industrial	4.37	3.89	112%	4	3.51	114%	3.97	3.15	126%
Non industrial	3.45	3.89	89%	4.16	3.51	119%	4.45	3.15	141%
Commercial	3.6	3.89	93%	3.75	3.51	107%	3.9	3.15	124%
Agricultural	1.13	3.89	29%	4.26	3.51	121%	4.55	3.15	145%
Sub total HT	4.14	3.89	107%	4.07	3.51	116%	4.13	3.15	131%
EHT									
66kV	4.12	3.89	106%	3.85	3.51	110%	3.76	3.15	119%
100kV	4.54	3.89	117%	3.52	3.51	100%	3.61	3.15	115%
Sub total EHT	4.43	3.89	114%	3.6	3.51	103%	3.65	3.15	116%
Railways	3.62	3.89	93%	3.67	3.51	104%	3.65	3.15	116%
Bulk supply	2.94	3.89	76%	2.9	3.51	83%	2.83	3.15	90%
Total	3.26	3.89	84%	3.19	3.51	91%	3.1	3.15	98%

SOURCE: TERI estimates

As observed, domestic, agriculture and street lighting are highly subsidized with cost recovery from these categories being as low as 29% in FY 2005-06. On the other hand, categories like LT Commercial consumers are cross-subsidizing categories with cost recovery as high as 214%. Table 6.40 also highlights that although the overall cost recovery has improved from 84% to 98%, the cross subsidy in the tariff structure has increased.

Convergence index (CI)

Figure 6.16 gives the trend in CI from FY 2002-03 to FY 2005-06.

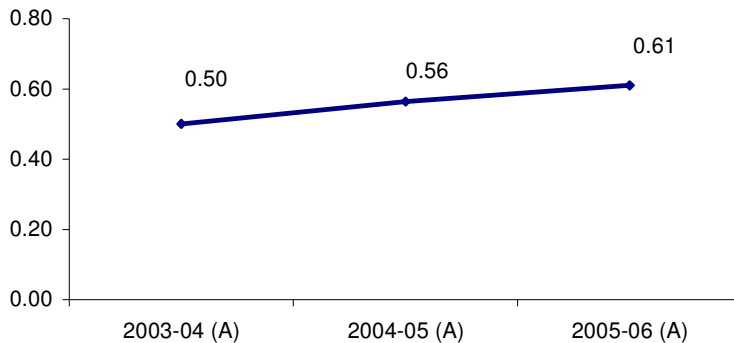


Figure 6.16 Trend in Convergence Index over the years

SOURCE TERI estimation from tariff orders issued by KSERC for FY 2003-04, FY 2004-05 and FY 2005-06

It is seen that in Kerala there has been no improvement in terms of tariff rationalization over the period; instead there is a positive increase in CI, which reflects increase in the level of cross-subsidy.

Subsidy support from the government and treatment of revenue gap

In FY 2003-04, the total ARR approved by the Commission was Rs. 3697.83 Crore as against Rs. 3850.31 Crore proposed by the Board. The expected revenue from tariffs and non-tariff income were Rs. 2901 Crore and Rs. 240.37 Crore leaving a revenue gap of Rs. 556.46 Crore. There was no hike in tariff announced by KSERC. The revenue gap was to be met from concessions and subsidy from the Government of Kerala. This included Rs. 182.56 Crore as exemption from payment of electricity duty under sec 3(1) of the KED Act and allowing duty collected under section 4 as grant to the Board, Rs. 175 Crore as subsidy provided in the budget of the Government of Kerala and Rs. 200 Crore as additional cash subsidy, total amounting to Rs. 557.56 Crore.

In FY 2004-05, the total ARR approved by the Commission was Rs. 3492.46 Crore as against Rs. 3922.02 Crore proposed by the Board. The expected revenue from tariffs and non-tariff income were Rs. 2965 Crore and Rs. 231 Crore leaving a revenue gap of Rs. 296 Crore. Again there was no hike in tariff announced by KSERC. The revenue gap was to be met from concessions and subsidy from the Government of Kerala. This included Rs. 34 Crore as exemption from payment of electricity duty under section 3(1) of the KED Act and Rs. 166 Crore as duty collected

under section 4 to be retained by the Board as grant, the total amounting to Rs. 200 Crore. The remaining gap of Rs. 96 Crore was left unmet for the Government to decide whether it wanted to provide additional subsidy to maintain same tariffs in the state.

In FY 2005-06, the total ARR approved by the Commission was Rs. 3367.32 Crore as against Rs. 3826.97 proposed by the Board. The expected revenue from tariffs and non-tariff income were Rs. 3046.47 Crore and Rs. 269.54 Crore leaving a revenue gap of Rs. 51.31 Crore. The revenue gap being less than 2% of the total revenue requirement, the Commission approved continuance of the tariffs prevailing in the state.

Table 6.41 Revenue gap over the years (Rs Crore)

Description	FY 2003-04	FY 2004-05	FY 2005-06
ARR	3697.8	3492.4	3367.3
Revenue from tariffs	2901.0	2965.0	3046.4
Non-tariff income	240.3	231.0	269.5
Revenue gap	556.4	296.0	51.3
Concessions and subsidy	557.5	200.0	-

SOURCE: Tariff orders for various years issued by KSERC and ARR Petition for FY 2005-06 and FY 2006-07

Release of subsidy by the Government of Kerala

Table 6.42 gives the details of the subsidy receivable from the Government of Kerala.

Table 6.42 Details of the subsidy receivable from the Government of Kerala

Sl No.	Particulars	FY 2003-04	FY 2004-05	FY 2005-06
(i)	Revenue depicts as per Accounts/ estimate	1007.43	342.76	309.50
(ii)	Revenue deficit as per SERC order	556.46	296.00	51.31
(iii)	SERC's order to bridge the Gap			
	(a) Adjustment against electricity duty etc payable by KSEB to GoK	182.56	200.00	0.00
	(b) Payment as subsidy from GoK to KSEB	375.00	96.00	51.31
(iv)	Amount paid as subsidy by GoK	556.46	0.00	0.00
(v)	Balance subsidy remained to be paid by GoK as per SERC order	0.00	96.00	51.31
(vi)	Unbridged revenue gap (i)- (ii)	450.97	46.76	258.19

SOURCE ARR and ERC filing for FY 2006-07

As seen from the above table, the Government is yet to release the subsidy amount recommended by KERC for FY 2004-05 and FY 2005-06. There has been communication between Government, Commission and Board in this regard, however, the amount still remains unsettled.

Under such a situation, the Commission needs to take more active role by rebalancing the tariff to meet the unmet revenue gap until the Government releases the subsidy. This shall also ensure that the financial viability of the utility is not hampered and it is able to supply good quality and reliable power to the consumers in a consistent manner.

Governance

Public participation

In order to undertake public consultation and solicit views of various stakeholders on the petition filed by the KSEB, the Commission after the acceptance of petition approves a public notice that is published in English and Malayalam dailies. In addition, the copies of the petition are made available to the public at a reasonable rate and the documents are posted on the website of the Commission.

Table 6.43: Level of public participation

Year	Time given for filing comments /objections	No. of written objections	No. of participants
FY 2003-04	60 days	20	67
FY 2004-05	45 days	24	44
FY 2005-06	60 days	12	33

SOURCE: Tariff orders for various years issued by KSERC

The major objections have been from the Industrial consumers, associations, chambers of commerce with limited participation from the domestic consumers. One reason for the same may be because no hike in tariff proposed by the KSEB in any of the above years. In FY 2003-04, despite extending the date of submitting the written objections by 15 days, the response from the stakeholders was not very encouraging. In FY 2004-05 also, only 24 written objections were filed. In FY 2005-06, the Commission conducted a workshop on “Effective consumer intervention in ARR”, so as to encourage consumers to participate in the tariff fixation process. The workshop was attended by a number of people including representatives from consumer organisations. Despite, these efforts, the number of objection received remains low.

Timeliness of tariff orders

In finalization of the tariff orders for various years, the Commission has considered written objections by various stakeholders, written and oral submissions of the KSEB, the discussions during the meeting of the State Advisory Committee (SAC) and comments received during the public hearings.

While the EA 03 mandates that the Commission must issue the tariff order within 120 days of the acceptance of the petition, KSERC has exceeded the same in each year. The delay though not substantial has primarily been because of collection of additional information from the KSEB officials and several meetings with both junior and senior officers of KSEB that were required for proceeding with further analysis. Table 6.44 indicates the timeliness of various tariff orders issued by the KSERC.

Table 6.44 Timeliness of tariff orders

Year	Date of filing of petition	Date of acceptance of petition	Date of Issuance of Order	Days from filing to acceptance	Days from acceptance to issuance
FY 2003-04	01-Aug-03	16-Aug-03	31-Dec-03	15 days	137 days
FY 2004-05	15-Dec-03	16-Dec-03	16-Apr-04	1 day	121 days
FY 2005-06	15-Nov-04	17-Nov-04	23-Mar-05	2 days	126 days

SOURCE: Tariff orders for various years issued by KSERC

Consumer advocacy and redressal mechanism

The KSERC has notified the regulations for "Consumer Grievance Redressal Forum and Electricity Ombudsman" on 6th October 2005. In accordance with these regulations, KSEB has constituted a consumer grievance redressal forum in each region i.e. Southern (Kottarakara), Central (Ernakulam) and Northern (Kozhikode) with Chairperson of the rank of Deputy Chief Engineer. Nature of complaints received by these forums includes conversion of phase of supply, supply interruption, voltage fluctuation, billing problems etc.

As regards Ombudsman, the Commission has already notified the relevant regulations and demarcated the chairperson and space for setting up of the Ombudsman. An application has been put up for the approval of the State Government in this regard, however no response has been received till date.

Regulatory initiatives

Implementation of Multi-year tariff framework

The Commission has notified the terms and conditions for determination of tariff for distribution and retail sale of electricity under MYT Framework on 12th October 2006 based on the comments received from various stakeholders and discussion during the public hearing.

The regulations state that the Accounts shall be segregated between Distribution and Retail supply business. Till such time there is complete segregation, the ARR of the Distribution Licensee shall be apportioned between the Distribution Business and Retail Supply Business by appropriate methodology. It further states that every Distribution Licensee shall file an application for approval of ARR and ERC along with

Tariff proposal under the MYT framework for the Control Period commencing from FY 07-08. The first control period shall be 3 years.

Discussions were held with KSERC in November 2006 during the visit of TERI team to Kerala. As per these discussions, the KSERC Commission intends to move towards a multi-year tariff framework from 2007-08 onwards.

Open access

The Commission has notified the terms and conditions for open access on 2nd November 2005. As per the regulations, phasing of open access for consumers shall be based on the following schedule.

Table 6.45 Phasing of open access for consumers

Phase	Consumers with maximum demand of	Time
Phase I	10 MW and above	From 1 st December 2005 onwards
Phase II	5 MW and above	From 1 st December 2006 onwards
Phase III	3 MW and above	From 1 st December 2007 onwards
Phase IV	1 MW and above	From 1 st December 2008 onwards

SOURCE; Website of KSERC

Till date, there have been two applications for the open access, first by Indal (Indian Aluminium Company) and second by a Cogeneration plant. The former was granted open access by the KSERC; however it has shifted its smelting plant to Orissa¹. For the latter, the KSERC has written to KSEB for comments on its applications and shall be pursued. Presently, no open access is taking place in the state.

Appeals against orders

No order of the Commission has been challenged in the Court and the Commission has never been given any directive by the Government.

Till date there have been two cases in Appellate Tribunal, first by Corporation of Thrissur against an order passed by KSERC relating to payment of interest/penal interest and second, by Binani Zinc Limited, against an order of the Government of Kerala to enhance tariff for high tension industrial consumers. Although, the latter was prior to the establishment of the KSERC, the tribunal instructed the appellant to refer to the

¹ The Commission has fixed a transmission charge of Rs. 10 paise/kWh to KSEB for the energy delivered at Indal. Also Indal was to compensate KSEB for transmission losses at 3% of the energy injected into the KSEB system for transmission to its premises. Indal was to pay a transmission surcharge of 25 paise per unit of energy delivered to it. This was to be reduced in a phase manner (5 paise per unit every year) to nil by 2009

KSERC, once it was enacted. The Tribunal has already dismissed both the cases¹.

In addition to the above, there have been two suo motto cases both of which have been decided in the favour of KSERC.

Status of annual accounts

The KSEB has been publishing its annual accounts on time. The audit accounts till FY 2004-05 and provisional accounts for FY 2005-06 have already been published.

Staffing

The KSERC operates with a Chairman, two Members and few other officers/ staff². It lacks adequate number of staff for carrying out its day-to-day activities. Table 6.46 indicates the total requirement of officers/staff submitted by the KSERC to the State Government. Out of total of 43 staffs requested by KSERC the State Government sanctioned only 13. Staffing therefore remains a problem with the KSERC.

Table 6.46 Total requirement of officers/staff

S. No.	Posts	Number
1	Advisor	3
2	Secretary	1
3	Director (Tariff)	1
4	Director (Engineering)	1
5	Joint Director (Tariff)	1
6	Joint Director (Engineering)	1
7	Law Officer	1
8	Senior Economic Analyst	1
9	Senior Financial Analyst	1
10	Deputy Director (Engineering)	2
11	Executive Assistant	3
12	System Administrator	1
13	Accounts Officer	1
14	Administrative Officer	1
15	Accountant	1
16	UD Clerk	1
17	Confidential Assistant	6
18	LD Clerk	1
19	Driver	3
20	Peon	3
21	Receptionist	1
22	Sweeper	2
23	Scavenger	1
24	Daffadar	1
25	Security Guard	3
26	Messenger	1

SOURCE: Obtained from KSERC

¹ In the first minor changes were done so as to enable the KSEB to collect arrears at an early stage

² Primarily support staff

Status of the directives issued by KSERC

In the tariff order for FY 2005-06, the KSERC has given several directives to the KSEB. Table 6.47 shows the status of important directives as indicated in the tariff order issued by KSERC in FY 2006-07.

Table 6.47 Status of important directives given by KSERC (based on the replies submitted by KSEB to KSERC)

No.	Summary of Directives	Status based on KSEB's reply										
1.	Completion of computerization of billing and replacement of meters	<p>The billing of HT and EHT consumers has already been computerized. Computerization of billing at LT level is taking more than the scheduled time because of a number of problems faced while moving from manual process to computerization. 183 sections out of the 601 sections are already computerized.</p> <p>Litigation and stay from the Hon'ble High Court on procurement of computer hardware, a necessity to conduct an IT audit on the software in view of the discussions held in the Kerala Legislative Assembly and requirement of huge data collection had delayed the process. The IT audit by C-DAC has now been completed.</p>										
2.	<p>Receivables and Collection efficiency: The Commission recommends the Board to improve collection efficiency to 98-99%. Consumer-wise analysis and efforts made by KSEB to collect the outstanding dues should be given. KSEB should provide correct picture of current level demand and collection and set up of Task Force for collecting outstanding dues.</p>	<p>All the consumers except the connections given under Scheme like "Kutir Jyothi" have been metered. The Board has been taking all efforts to improve the collection efficiency. The collection efficiency of the LT consumers of the Board in the year 2002-03, 2003-04, 2004-05 was 92.29%, 93.28% and 93.5% respectively. During the current year, up to the month of September, the average collection efficiency has been 94.1%.</p> <p>KSEB indicated that the collection efficiency could not be improved further due to non-payment of the electricity charges by the Government Departments, State PSUs and protracted litigations by private consumers. A Task Force for arrear collection has been set up by the Board, which has submitted a detailed report on arrears.</p> <p>The report highlights consumer category-wise arrears pending for various years. Total arrears as indicated in the report are equivalent to five months of revenue from sale of power by the KSEB. The KSEB has categorized all the dues in three categories – cases pending under litigation; cases referred to revenue recovery actions but pending recovery and cases pending with the Government and in the Board for decisions. Appropriate measures are being taken by the Board to expedite the recovery of dues in each of the above category.</p>										
3.	Furnish report on replacement of faulty meters	<p>The KSEB has furnished the details of faulty meter replacement during for the last few years. These are given below: -</p> <table border="1"> <thead> <tr> <th>Year</th> <th>No. of Faulty meter replaced</th> </tr> </thead> <tbody> <tr> <td>2002-03</td> <td>4.21 Lakhs</td> </tr> <tr> <td>2003-04</td> <td>8.67 Lakhs</td> </tr> <tr> <td>2004-05</td> <td>4.35 Lakhs</td> </tr> <tr> <td>2005-06</td> <td>4.20 Lakhs (up to October)</td> </tr> </tbody> </table>	Year	No. of Faulty meter replaced	2002-03	4.21 Lakhs	2003-04	8.67 Lakhs	2004-05	4.35 Lakhs	2005-06	4.20 Lakhs (up to October)
Year	No. of Faulty meter replaced											
2002-03	4.21 Lakhs											
2003-04	8.67 Lakhs											
2004-05	4.35 Lakhs											
2005-06	4.20 Lakhs (up to October)											
4.	The Board shall furnish a detailed action plan for improving the sales to Industrial consumers	<p>As submitted by the KSEB, the Industrial activity in the state is dependent on a large number of socio economic, political & environmental factors including power scenario. With a view to generate additional demand for energy from the Industrial consumers, the Board has inter alia taken the following measures:-</p> <ol style="list-style-type: none"> Waived the minimum demand during the period of lock out etc. of tea estates Allowed installments /time extension to remit the dues by large number of Industrial consumers Introduced one time settlement scheme to pay the arrears and revive connections There is practically no delay in giving new industrial connections The Board has introduced a scheme of incentive for load factor and power factor improvements No upward tariff revision has been proposed since October 2002 <p>Due to the above measures, unlike in the past, in 2005-06, there is an increase of 4% in energy consumption by the industrial consumers. The Board expects that there will be a growth of 5% in</p>										

No.	Summary of Directives	Status based on KSEB's reply
		energy consumption of the industrial consumers in 2006-07
5.	The Board shall furnish the complete data and results in respect of cost of service study latest by 31 st May 2005'	As submitted by the Board, it has already taken steps to collect the data required for conducting the cost of service. Due to delay in processing the same by the Board, the Commission has itself initiated a study for "determination of sample load curves for different category of consumers in KSEB system and estimation of typical energy losses at different voltage level". The study has been commissioned to Central Power Research Institute. The study is to be completed by November 2006.
6.	The Board shall file the segregation of voltage level technical loss and loss reduction plan	As submitted by the Board, it has taken steps for complete metering of transformers under APDRP so that it is able to assess the voltage-wise losses. The Commission however has commissioned its own study as indicated above.
7.	The Board shall file separate ARR& ERC in respect of transmission licensee and distribution licensee. The Board shall file petition for transmission tariff in accordance with the approved ARR&ERC order before 30 th April 2005.'	As submitted by the KSEB, the State Government is in the process of deciding the structure of the Board with reference to the provisions of the Electricity Act-2003. KSEB is still operating as a single entity with the concurrence of the State and Central Government. Segregation of assets and liabilities of Generation, Transmission and Distribution sectors of the Board involve a great deal of study, effort and time. Moreover, the new structure of future setup of the Board will be a deciding factor in this regard. Therefore, the Board had requested the Commission to allow to file the ARR for the year as a single entity.
8.	Commission directed the Board to initiate steps to separate financial and physical functions of LDC	The Board has submitted that the decision of the Government on Separation of the Load Despatch function or formation of a separate load despatch center etc is still awaited and hence no action in this regard has been taken till date.
9.	The Board shall file the proposal on principles of determination of wheeling charges	KSEB has submitted that it is in process of determination of function wise cost, as part of the cost of service study and shall submit the principles for determination of wheeling charges along with the cost of service study results

SOURCE: Tariff orders for various years issued by KSERC

Regulations notified by KSERC

Regulations	Date
KSERC (Terms and Conditions for Determination of Tariff for Distribution and Retail Sale of Electricity under MYT Framework) Regulations, 2006	12 th October 2006
Draft KSERC (Intra-State ABT) Regulations, 2006	29 th September 2006
Draft KSERC (Terms and Conditions of Tariff for Transmission of electricity) Regulations, 2006	6 th March 2006
KSERC (Power Procurement from Renewable Sources by Distribution Licensee) Regulations, 2006	6 th March 2006
KSERC (Terms and Conditions for Determination of Hydro Generation Tariff) Regulations	2005
KSERC Draft (Fees) Regulations	2005
KSERC Business Regulations.	3 rd January 2004
KSERC Tariff Regulations	3 rd January 2004
KSERC (Consumer Grievance Redressal Forum and Electricity Ombudsman) Regulations, 2005	6 th October 2005
Kerala Electricity Supply Code 2005	14 th December 2005
KSERC (First Amendment) Regulations, 2005	
Kerala Electricity Supply Code 2005	2 nd March 2005
KSERC (Procedure for filing appeal before the Appellate Authority Regulations, 2005	7 th October 2005

Regulations	Date
KSERC (Accounting) Regulations, 2005	2 nd April 2005
Kerala State Electricity Grid Code, 2005	13 th January 2006
KSERC Draft (Terms and Conditions of Tariff for Retail Sales Of Electricity) Regulations.2004	2004
KSERC (Terms and Conditions for Open Access) Regulations, 2005	2 nd November 2005
KSERC (Conditions of License for State Transmission Utility) Regulations, 2005	14 th December 2005
KSERC (Conditions of License for Existing Distribution Licensees, Regulations, 2006	23 rd February 2006
Terms and Conditions of Tariff for Retail Sale of Electricity, Regulations, 2006.	23 rd March 2006
KSERC (Licensing) Regulations, 2006	31 st March 2006
KSERC (Licensees' Standards of Performance) Regulations, 2006	9 th May 2006

Power sector rating

As per the performance rating of the state power sector carried out at the instance of the Ministry of Power, GoI, Kerala has been given the following ratings during FY 2003-04, FY 2004-05 and FY 2005-06

Table 6.48 Power sector ratings

	FY 2003-04	FY 2004-05	FY 2005-06
Rank	15	16	9
Score	34.25	31.48	31.63

The state of Kerala moved up six notches from 15th in FY 2003-04 to 9th in FY 2005-06. The ranking report highlighted the following as the reasons for this:

Strengths

- Strong regulatory processes in place with timely filing of revenue requirements and issue of orders
- High level of household electrification
- High metered sales at 74 per cent of the total units input in the system
- Low failure rate of distribution transformers

Conclusion

- KSEB still operates as a vertically integrated utility with no unbundling
- Per unit cost of power (including both the power purchase cost and cost of own generation) is one of the lowest in the country. However, the impact of the same on total ARR is nullified by high level of employee cost and interest cost

- Employee productivity has been decreasing over the years as highlighted by number of indicators like employee cost per unit of sale, revenue per employee etc
- Actual loss level in the state though lower than other states have not reduced much in the past three years
- Consumption per consumer and connected load per consumer in the state seem to be on the lower side. This indicates either misreporting or lack of detailed audit on the part of the utility to assess the actual load
- Arrears to the tune of Rs. 1398 Crore, equivalent to five months revenue from sale of power are yet to be recovered
- Delay in release of subsidy by the Government is another reason for poor financial position of the KSEB over the years
- Financial position though has improved with KSEB restructuring its loan portfolio as per KSERC's directions, there is still further scope of improvement
- Lack of tariff rationalization is one major area of concern. Convergence index and hence the level of cross subsidy has been increasing over the years. This is even more important from the point of view of sustaining the industrial consumers in the state
- High end-tariff to commercial consumers due to non-rationalization is another area of concern. This may also lead to misreporting of their commercial connections by the consumer to avail low domestic tariff
- Tariff orders have been issued on time with only minor deviations
- There has been minimal public participation from domestic consumer in the public hearings. One of the reasons has been no tariff hike proposed by the Board for domestic consumers over the last three years
- Audited annual accounts have been published by the Board on time and there has been no delays in the same
- There is no pending cases and no tariff order has ever been challenged in court
- Most of the regulations are in place and have been already notified by the Commission.

CHAPTER 7 Madhya Pradesh

Introduction

The Madhya Pradesh Electricity Regulatory Commission (MPERC) was constituted by the Government of Madhya Pradesh on 20th August, 1998 under the Electricity Regulatory Commission's Act, 1998. The Electricity Act 2003 enacted by the Parliament came into force w.e.f. 10th June 2003 and the Commission is now deemed to have been constituted and functioning under the provisions of Electricity Act 2003.

The Government of Madhya Pradesh (GoMP) on 31st May, 2005 restructured the functions and undertakings of Generation, Transmission, Distribution and Retail Supply of electricity earlier being carried out by the Madhya Pradesh State Electricity Board (MPSEB or Board) and transferred the same to the following five companies:

1. M.P. Power Generating Company Ltd., Jabalpur (MPPGCL)
2. M.P. Power Transmission Company Ltd., Jabalpur (MPPTCL)
3. M.P. Poorv Kshetra Vidyut Vitaran Company Ltd., Jabalpur (MPPKVVCL)
4. M.P. Madhya Kshetra Vidyut Vitaran Company Ltd. Bhopal (MPMKVVCL)
5. M.P. Paschim Kshetra Vidyut Vitaran Company Ltd., Indore (MPPKVVCL)

With effect from 1st June 2005, the Operation and Management Agreement that existed between MPSEB and the five companies came to end and the three distribution companies started functioning independently as distribution licensees in their respective areas of license.

In June 2006, GoMP effected the transfer and vesting of the functions, properties, interest rights and obligations of the MPSEB relating to the Bulk Purchase and Bulk Supply of Electricity in the State Government and simultaneously re-transferred and re-vested the same to the M.P Power Trading Company ('Tradeco' or 'MP Tradeco'). Since then, MP Tradeco is discharging the responsibilities of procurement of power in bulk and supplying to the three Discoms.

The Commission issued a tariff order for FY 2004-05. The tariff order for FY 2003-04 could not be issued due delay in submission of petition and lack of adequate information in the petition submitted by the extended date of 30th April, 2003 to

file ARR and 31st May 2003 for the tariff proposal. The reasons given by MPSEB for the delay were as follows:

1. With the issue of tariff order on 30th November 2002 by the Commission, several structural changes were made in the tariff, impact of which could be assessed only from February 2003 onwards. Further, MPSEB was of the view that unless the impact is not known it would be difficult for it to project the estimate of sales of energy and thus the revenue in the ARR for FY04
2. MPSEB is in the process of setting up a dedicated tariff and regulatory cell and consequently some more time would be required for filing of the ARR
3. Results of implementing the directions of the Commission are likely to be available after some time, which MPSEB would like to incorporate in the ARR
4. Improvement in the database and MIS
5. Restructuring of MPSEB
6. Delay in bifurcation of assets and liabilities between MPSEB and CSEB (Chattisgarh State Electricity Board).

Though the MPSEB submitted an ARR, it did not submit a tariff proposal to bridge the revenue gap. The Commission gave further time to MPSEB to submit the information gaps identified and a tariff proposal.

On 28th October 2003, the MPSEB requested the Commission to allow it to file a consolidated ARR for FY2003-04 and FY2004-05 and a tariff revision petition for FY2004-05 taking into account the revenue gap of the two years together. The Commission allowed it to file a consolidated ARR for FY2003-04 & FY2004-05 by 15th December 2003. Subsequently, in December 2003, the MPSEB requested the Commission again to extend the last day of filing the ARR by 15 days. The Commission expressed its anguish over frequent requests for time extension for filing ARR and the inability of the Licensee to firm up its revenue requirement for FY2003-04 even in the month of December 2003 and decided to examine the ARR for FY2003-04 with the details available with it. However, the MPSEB submitted its ARR for FY2003-04 & FY2004-05 on 24th December 2003, proposing to bridge the revenue gap for FY2004-05 through tariff revisions and/or government subsidy and to treat the revenue gap for FY2002-03 and FY2003-04 as regulatory asset to be amortised in subsequent years when MPSEB is financially stronger and would require lower tariff hikes.

The Commission, in its order considered issues related to revenue requirement for FY 2004-05 only, as audited accounts for FY 2002-03 and FY 2003-04 were not available.

For FY 2005-06, the Commission issued the detailed tariff order for MPPGCL and MPPTCL; however, only tariff rates were issued for distribution companies, since the companies had not filed separate petitions as required. Accordingly, these have been taken into account in this section. The generation tariff order has been considered to analyse the fuel cost for generation. The petition submitted by the MPSEB has been considered for analysis of all other parameters. The Commission approved annual transmission charges of Rs 462.21 Crore. It also estimated the transmission charges to be paid by short term open access customers as Rs 569.09 per MW per day and transmission charges payable by wind generator as Rs 0.42 per unit transmitted.

All the petitions submitted by the licensees over the years and tariff orders issued by the MPERC are available on the website of the MPERC.

Demand supply gap

The power- supply position in the state has been deteriorating over the years. The state has suffered energy shortages of 13.2% and 13.5% and in FY 2003-04 and FY 2004-05 respectively. The corresponding peak shortages have been 22.10% and 18.50%.

Installed capacity

The existing details of installed capacity are given in Table 7.1.

Table 7.1. Installed capacity in Madhya Pradesh

S.No.	Power Station	Installed capacity (MW)	MP share (MW)
1	Amarkantak I (30+20 MW)	50	50
2	Amarkantak II (2x120 MW)	240	240
3	Satpura I (5x62.5 MW)	312.5	187.5
4	Satpura II (200+210 MW)	410	410
5	Satpura III (2x210 MW)	420	420
6	Sanjay Gandhi, Birsinghpur -I (2x210 MW)	420	420
7	Sanjay Gandhi Birsinghpur -II (2x210 MW)	420	420
	Thermal Power Station	2272.5	2147.5
1	Gandhi Sagar(5x23 MW)	115	57.5
2	Pench, Totladoh(2x80 MW)	160	107
3	Rani Awanti Bai Bargi (2x45 MW)	90	90
4	Ban Sagar I Tons(3x105 MW)	315	315
5	Birsinghpur(1x20 MW)	20	20
6	Rajghat (3x15 MW)	45	22.5
7	Ban Sagar II Silpara(2x15 MW)	30	30
8	Bansagar -III Deolond (3x20 mW)	60	60
9	Bansagar -IV Jhinna (2x10 MW)	20	20
10	Madhikheda (2x20 MW)	40	40

S.No.	Power Station	Installed capacity (MW)	MP share (MW)
	Jawaharsagar & Ranapratapsagar Station of Rajasthan (50% share)		135.5
	Hydro Power Station	895	897.5
	Total	3167.5	3045
	Mini/Micro Hydel	5.45	5.45
	Grand Total	3172.95	3050.45

Source: <http://www.mppgenco.nic.in/mpgenco-install-detail.htm>

Many of the hydro power stations are small in size and most of plants are very old. The average age of thermal power plants is 21 years and thermal is 22 years.

Of the total installed capacity of 3050.45 MW, 70.40% is thermal, 29.42% is hydro and 0.18% is on account of mini and micro hydel plants (September 2006). The installed capacity in FY 2003-04 and FY 2004-05 was 2990.5 MW, of which 2147.5 MW was thermal and balance 843 MW was hydel.

FY 2002-03 in retrospect

As per the ARR submitted by MPSEB for FY2005-06, it had an unmet revenue gap of Rs 871.78 Crore in FY 2002-03 and 270.83 Crore in FY 2003-04, i.e., a deficit of 20% and 6% respectively. There was substantial increase in revenue from sale of power in FY 2004-05 over FY 2003-04 of approximately Rs 300 Crore.

Consumption and access

Sales/Demand estimation

For FY 2004-05, the licensee projected sales based on past trends and further modifying the projections taking into consideration recent developments such as Licensee's efforts to improve power supply quantity and quality, reduction in T&D losses, emerging legal frame work in light of recent enactments and other factors such as market forces, price elasticity, paying capacity and potential for consumption etc.

The Commission reviewed the methodology adopted by the licensee for forecasting sales for FY 2004-05 and approved sales of 16885 MU as against 16724 proposed by the licensee. The details are given in Table 7.2.

Table 7.2. Sales for FY 2003-04, FY 2004-05 and FY 2005-06 (MU)

	Proposed	Approved	Actual
FY 2003-04	15996	NA	15996
FY 2004-05	16724	16885	17106
FY 2005-06	18022	NA	NA

Source:

- (i) Tariff order for FY 2004-05
- (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

For the LT categories, the Commission took into consideration the expected growth in demand in terms of number of consumers, increase in connected load and quality of supply in terms of supply hours likely to be maintained for LT categories. The Commission also reviewed the MIS of sales to consumers maintained by the licensee (April-September 2004) and compared it to corresponding period of the previous year to assess the consumption growth in FY 2004-05.

Category wise sales

A detailed analysis of category wise sales has been summarised in table 7.3.

Table 7.3. Category wise sales

Consumer category	FY 2003-04		FY 2004-05		FY 2005-06
	Actual	Proposed	Approved	Actual	Proposed
	MU	MU	MU	MU	MU
Domestic/SLP	3311	3614	3809	3755	4034
Non-Domestic	688	736	736	805	902
Water Works	163	169	169	195	221
Industrial	651	708	709	678	728
Agricultural	5,342	5,342	5,342	5,320	5,462
Street Lights	127	133	133	124	127
Total (LT)	10282	10702	10898	10877	11473
Railways	1267	1353	1335	1392	1478
Coal	542	564	564	544	554
Steel	148	176	176	248	279
Cement	524	524	524	498	477
Irrigation/Water Works	304	316	316	327	340
Other	2487	2637	2620	2714	2894
RE Co. Society	440	451	451	504	525
Border Villages	3	3	3	2	2
Total (HT)	5714	6022	5987	6229	6549
Total (LT+HT)	15996	16724	16885	17106	18023

Source: (i) Tariff order for FY 2004-05 & (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

The sales have shown an increasing trend over the years. The share of each category in total sales is given in Table 7.4.

Table 7.4. Share of each category in total sales (%)

Category	FY 2003-04	FY 2004-05	FY 2005-06
	Actual	Actual	Existing
Domestic/SLP	21%	22%	22%
Non-Domestic	4%	5%	5%
Water Works LT	1%	1%	1%
Industrial	38%	38%	38%
Agricultural	35%	33%	32%
Street Lights	1%	1%	1%
Total	100%	100%	100%

Source:

(i) Tariff order for FY 2004-05

(ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

The above table shows that there has not been much change in the consumption pattern over the last 3 years except for a slight decline in the share of agricultural consumption and increase in domestic consumption.

The licensee had proposed sales to SLP (Single light Point) consumers as 237.92 MU on the assumption of 25 units of monthly consumption per consumer. The State Government had decided to extend free supply limited to 25 units per month to SC/ST SLP consumers, below poverty line, who will get meters installed at their premises or will give an undertaking to get ammeter installed. In the order, the Commission reiterated its reservations on this assumption and approved average consumption as 46 units per month per consumer and estimated the sales at 433 MUs. This estimate of the MPERC was based on a sample study to assess the consumption for this category. The study was done at 132 divisions out of 135 divisions in the state and a sample of 10 consumers was chosen in each distribution centre and consumption assessed by metering.

For agriculture consumers, the licensee did not propose any change in sales from the FY 2003-04 levels. It however, forecasted the number of consumers to be 1202083 and the connected load to grow at 7.50%. It also expected better supply to agriculture consumers this category and conversion/addition of about 238654 into metered category and assumed the load factor to be 17.54% (1146 kwh/HP/Year).

The Commission's analysis of the data submitted indicated a decline in both connected load and consumers. It did not find the explanation given by the licensee for reduction in connected load on account of poor monsoon as tenable. It also noticed that the licensee has not undertaken any recent study based on statistical techniques to arrive at a reliable estimate of load

factor. However, taking into account the statements of the State Government to the effect that ample supply shall be ensured at all costs for agriculture sector and for rural areas, the Commission did not reduce the quantum of energy estimated by the licensee for agriculture requirement and approved the Licensee's estimates of agricultural consumption at 5342 MU for FY2004-05.

The Commission also directed the Licensee to provide DTR (Distribution Transformer) level metering data to the Commission based on the already installed meters and to ensure that all distribution transformers supplying power predominantly to agriculture users are metered in the shortest time.

Figure 7.1 shows trend in agricultural consumption over a period of ten years from FY 1996-97 to FY 2005-06.

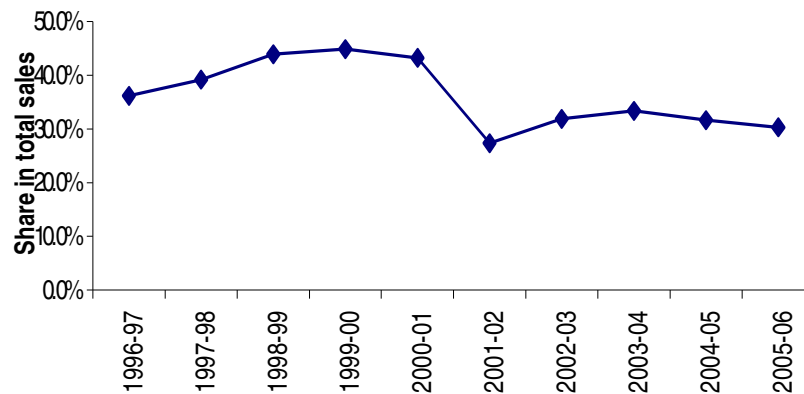


Figure 7.1. Trend in agricultural consumption

Source.

- (i) Annual report (2001-02) on the working of SEBs and Electricity Departments by Power and Energy Division- Planning Commission, Gol,
- (ii) Tariff order for FY 2004-05 &
- (iii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

Till FY 2000-01, the share of agriculture in total sales was as high as 45% and declined to 27% in FY 2001-02. It however increased to 32% in FY 2002-03 and further to 33.4% in FY 2003-04. In FY 2004-05 it dropped to 31% and further declined to 30% in FY 2005-06. This was primarily due to appropriate recognition of T&D losses by regulatory commissions that were being masked in agricultural consumption all across the country.

Number of consumers and connected load

Table 7.5 summarises the number of consumers in each category for FY 2003-04, FY 2004-05 and FY 2005-06.

Table 7.5. Number of consumers

<i>Consumer category</i>	FY 2003-04	FY 2004-05	FY 2005-06
	Actual	Actual	Projection
Domestic/SLP	4643652	4679213	4805945
Non-Domestic	583519	591431	612251
Water Works LT	15802	16331	16906
Industrial LT	84740	82952	83322
Industrial HT	2003	2029	2284
Agricultural LT	1098558	1107082	1158297
Agricultural HT*	172	181	183
Street Lights	14508	14322	14562
Total	6442954	6493541	6693750

*Includes water works HT

Source.

(i) Compendium of Power Statistics, 2004-05, MPSEB

(ii) Tariff order for FY 2004-05

(iii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

The total number of consumers has increased from 6442954 in FY 2003-04 to 6693750 in FY 2005-06, representing a CAGR of 1.93%. There has not been much change in the category wise composition of consumers with domestic category comprising the maximum.

Table 7.6 gives the connected load in each category for FY 2003-04, FY 2004-05 and FY 2005-06.

Table 7.6. Connected Load (kW)

Consumer category	FY 2003-04	FY 2004-05	FY 2005-06
	Actual	Actual	Petition n
Domestic/SLP	1967503	2056988	2134457
Non-Domestic	687060	730514	747322
Water Works LT	97153	100359	102602
Industrial LT	766257	759459	756346
Industrial HT	1863241	1919219	1927237
Agricultural LT	3162857	3192143	3423823
Agricultural HT	85720	87938	88432
Street Lights	48453	51244	55521
Total	8678244	8897864	9235739

*Includes water works HT

Source.

(i) Compendium of Power Statistics, 2004-05, MPSEB

(ii) Tariff order for FY 2004-05

(iii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

The present mix of consumers and connected load is given in Table 7.7.

Table 7.7. Mix of consumers and connected load in FY 2005-06

Category	FY 2005-06	
	Consumer mix	Connected load
Domestic/SLP	71.80%	23.11%
Non-domestic	9.15%	8.09%
Water works and agriculture	17.56%	39.14%
Industry	1.28%	29.06%
Others	0.22%	0.60%
Total	100%	100%

*Includes water works HT

Source. ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

The above data makes it clear that the highest number of consumers is in the domestic category and the highest connected load is in water works and agriculture category. Details of category wise per consumer load are given in Table 7.8.

Table 7.8 Per consumer load (kW/consumer)

Consumer category	FY 2003-04	FY 2004-05	FY 2005-06
	Actual	Actual	Petition
Domestic/SLP	0.42	0.44	0.44
Non-Domestic	1.18	1.24	1.22
Water Works LT	6.15	6.15	6.07
Industrial LT	9.04	9.16	9.08
Industrial HT	930.23	945.89	843.80
Agricultural LT	2.88	2.88	2.96
Agricultural HT	498.37	485.85	483.23
Street lights	3.34	3.58	3.81
Total	1.35	1.37	1.38

*Includes water works HT

Source.

(i) Compendium of Power Statistics, 2004-05, MPSEB

(ii) Tariff order for FY 2004-05

(iii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

The average connected load per consumer in Madhya Pradesh is 1.38 kW, the highest being that in the agriculture and water works combined. The load per consumer in commercial and industrial categories appears to be reported on the lower side and therefore reflects the need to accurately assess the load for all categories.

With regards to revenue, the maximum contribution comes from the industrial consumers. Domestic consumers are about

70% of total consumer base, but their contribution to revenue is only 18%. Figure 7.2 gives the details.

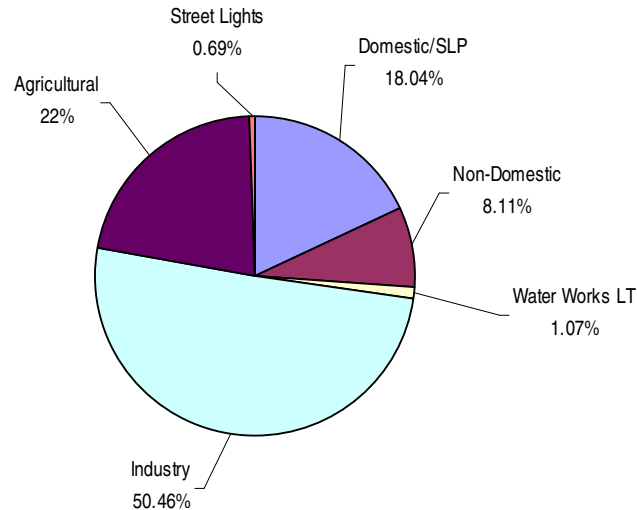


Figure 7.2. Contribution to revenue by major categories (FY 2004-05)

Source. Tariff petition for FY 2005-06

In the petition for FY 2005-06, the licensee submitted that as per the information available till the filing, the above mix would change slightly and the contribution of domestic category would increase to 20.22% and industry will fall to 49.44%.

Table 7.9 gives the revenue per unit of sale for different categories.

Table 7.9. Revenue per unit of sale for different categories

Category	Rs/kWh	Rs/kWh
	FY 2004-05 Actual	FY 2005-06 Petition
Domestic/SLP	2.79	3.09
Non-Domestic	5.85	5.64
Water Works LT	3.18	3.12
Industrial	4.46	4.39
Agricultural	2.23	2.15
Street Lights	3.23	3.48
Total	3.40	3.42

The highest realisation per unit of sale is from the Non domestic (commercial) consumers followed by industrial consumers. The movement in cross subsidy due to tariff realisation is discussed later in this chapter.

Status of rural electrification

Under the Rajiv Gandhi Grameen Vidhyutikaran Yojana (RGGVY) launched by Ministry of Power in April 2005, an amount of Rs.666.86 Crore has been sanctioned to Madhya Pradesh. The scheme covers 48 districts.

Table 7.10 highlights the status of rural household electrification in Madhya Pradesh.

Table 7.10 Rural household electrification

Total number of rural households	Households having electricity	% Electrified households	Unelectrified households	% Unelectrified households
8124795	5063424	62.32	3061371	37.68

Source: www.powermin.nic.in

As far as village electrification is concerned, 3.15% (1643 out of 52117) villages still remain to be electrified in Madhya Pradesh. Under the RGGVY, Madhya Pradesh (NTPC and DISCOMS) have a tentative target of electrifying 100 villages in FY 2006-07¹.

Efficiency improvement

Transmission & distribution (T&D) loss estimation

Table 7.11 gives a comparative view of the loss approved by the MPERC in its tariff orders, vis-à-vis the actual loss had and approved loss in subsequent tariff orders.

Table 7.11. T&D loss reduction targets

	FY 2002-03	FY 2003-04	FY 2004-05	FY 2005-06
% loss level (MPERC approved in FY 2002-03)	44%	40%	37%	34%
Proposed loss in petition (FY 2004-05 & FY 2005-06) ²	NA	43.99%	43.0%	40.50%
Approved in tariff order (FY 2004-05)	NA	NA	40.05%	37*%
Actuals	44.20%%	43.95%	43.08%	NA

Source. Tariff orders issued by MPERC

* Stated by the MPERC in order for FY 2004-05

Table 7.11 makes it clear that the actual reduction in T&D loss is much lower than that approved by the Commission in its tariff orders. Though, the T&D losses have reduced over years, from about 51% in FY 2000-01 to 43.08% in FY 2004-05, the progress is not much. Even the Commission expressed its

¹ Source: Ministry of Power website accessed on November 20, 2006
<http://powermin.nic.in/bharatnirman/progress%20on%20electrification%20of%20villages%20&%20households.pdf>

² The Board in its tariff petition for FY 2004-05 submitted that due to inadvertent mistake in the method of calculation, it was considering, reporting and owning T&D loss taking place outside the periphery of Madhya Pradesh, as its own loss. It further emphasised in this and rectified it in the petition for FY 2005-06. It further submitted that T&D loss excluding external losses was 42.55% in FY 2003-04 and 41.49% in FY 2004-05 and proposed 38.97% for FY 2005-06.

dissatisfaction with the performance of MPSEB in FY 2004-05 order.

Collection efficiency

MPSEB suffers not only from high T&D losses but also from low collection efficiency. The status of collection efficiency for the FY 2000-01 to FY 2005-06 is summarised below in Figure 7.3.

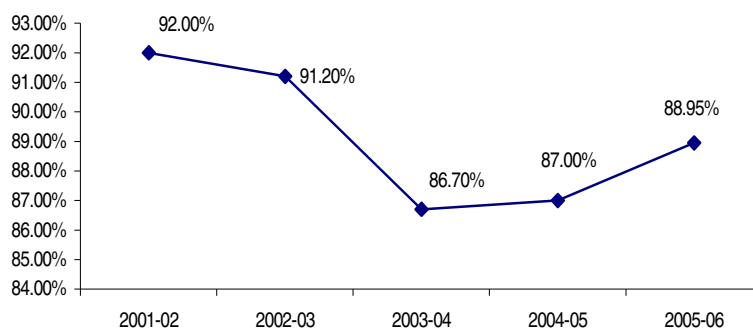


Figure 7.3. Collection efficiency

Source. Tariff order for FY 2004-05

Website of MPERC: <http://mperc.org/collec-eff-annu-0506.html>

The collection efficiency showed a downward trend till FY 2003-04, but is again showing an improvement. As per information available on the website of MPERS, the collection efficiency for the state as on June 2006 was 93.47%.

AT&C loss

The AT&C loss from FY 2001-02 to FY 2004-05 for the three distribution companies is summarised below in Table 7.12. The tariff orders did not have these numbers; therefore they have been sourced from the data available on the website of the APDRP programme.

Table 7.12. AT&C losses

	FY 2002-03	FY2003-04	FY 2004-05	FY 2005-06
	%	%	%	%
Discoms	Actual	Actual	Actual	Approved
MP Poorva KVVCL	34.05	42.68	44.37	31.7
MP Paschim KVVCL	43.41	45.66	38.86	35.5
MP Madhya KVVCL	51.13	57.06	53.17	41.6

Source. http://www.apdrp.com/apdrp/projects/about_apdrp.htm

The Central Discom (Madhya KVVCL) has the highest AT&C losses whereas the West Discom (Paschim KVVCL) has shown the highest improvement. In the order for FY 2006-07, the

Commission gave the following targets for AT&C loss reduction to the companies for the next three years (Table 7.13).

Table 7.13. AT&C loss targets approved by MPERC in order for FY 2006-07

Discoms	FY 2006-07	FY 2007-08	FY 2008-09
	Approved (%)	Approved (%)	Approved (%)
MP Poorva KVVCL	32.5	29.5	26.5
MP Paschim KVVCL	30	27.5	25
MP Madhya KVVCL	37	32	27.5

Source. Tariff order for FY 2006-07

However, considering the past performance of the licensee as far as loss reduction is concerned, it seems unrealistic that these will be achieved.

Metering

At present, all 11 kV meters in Madhya Pradesh are metered. However, only 2% of the total distribution transformers, 3000 out of a total number of 160000 are metered. The status of consumer metering is given in Table 7.14.

Table 7.14. Status of consumer metering (in lakhs)

	Numbers	Metered	Percentage metered
FY 2004-05	64.92	46.50	72
FY 2005-06	64.92	46.50	72

Source. www.powermin.nic.in

In the tariff order for FY 2004-05, the Commission brought out the fact that even though unmetered consumers decreased from FY 2002-03 to FY 2003-04 by almost 31% (33.2% to 22.7%), the unmetered sales as a percentage of total sales have increased from 25.63% in FY 2001-02 to 32.85% in FY 2003-04

DT failure rate

The trend in DT failure in the three Discoms from FY 2004-05 to FY 2005-06 is given in Table 7.15.

Table 7.15: DT Failure/replacement rate (5)

Discoms	Failure/Replacement of distribution transformers	
	FY 2004-05	FY 2005-06
MP Poorva KVVCL	19.13	17.49
MP Paschim KVVCL	21.99	12.65
MP Madhya KVVCL	25.31	22.18

Source: Website of MPERC. www.mperc.org

The above table shows a clear improvement in DT failure/replacement rate.

Fuel cost for own generation

The MPSEB proposed a generation cost of Rs 1479.06 Crore for FY 2004-05, an increase of 18.25% over FY 2003-04. The

Commission approved a higher cost at Rs 1578.34 Crore for FY 2004-05, on account of the following two factors:

1. The MPSEB made an error in calculation transit losses as Rs 21.07 Crore instead of Rs 53 Crore. The generation cost proposed thus became Rs 1511.45 Crore. The Commission pruned down the transit losses to Rs 34 Crore.
2. The Commission considered the availability of the entire generation capacity of STPS- Sarni since the entire generation was being used by MP and the energy account between Rajasthan and MP was reportedly not being settled and had been pending for several years. This led to additional fuel cost incurred for generation in STPS Sarni and a higher assumption of own generation leading to reduced need for power purchase.

Table 7.16 gives the details of fuel cost for power generation over the years.

Table 7.16. Fuel cost for power generation and units generated from FY 2003-04 to FY 2004-05

	FY 2003-04 Actual	FY 2004-05 Petition	FY 2004-05 Approved	FY 2004-05 Actual
Units generated (MU)	14523	14176	14977	15154
Fuel cost for power generation (Rs Crore)	1250.77	1479.06	1578.30	1443.33

Source. Tariff order for FY 2004-05

Website of MPERC: <http://mperc.org/collec-eff-annu-0506.html>

The actual generation cost was much lower than proposed and approved amount at Rs 1443.33 Crore. The source wise break up of generation cost is given in Table 7.17.

Table 7.17. Source wise break up of generation cost (Rs Crore)

Details	FY 2003-04 Actual	FY 2004-05 Petition	FY 2004-05 Approved	FY 2004-05 Actual
Fuel and related expenses				
<i>ATPS Chachai</i>	114.55	135.14	127.89	129.10
<i>STPS Sarni</i>	654.46	770.84	874.58	772.07
<i>SGPTC Bir'pur</i>	437.45	512.75	515.28	481.78
Cost of water	0.33	11.18	11.18	11.175
Cost of lubricating oil, consumables and chemicals	5.01	6.10	6.10	6.10
Station supplies	0.22	0.2	0.2	0.2
Other costs (entry tax etc)	25.68	30	30	30
Cess of auxiliary consumption	13.08	12.85	13.10	12.90
Generation cost	1250.78	1479.06	1578.33	1443.33

Source. Tariff order for FY 2004-05

Website of MPERC: <http://mperc.org/collec-eff-annu-0506.html>

The MPPGCL and MPSEB filed a separate petition for determination of generation tariff for FY 2005-06 on which the Commission issued as order in January 2006. In this petition, the petitioner proposed generation of 14551.91 MU from thermal and hydel plants, and a fuel cost of 1494.76 Crore. The Commission undertook a detailed analysis and approved fuel cost of Rs 1468.93 Crore and net generation of 15488 MU amounting to a per unit fuel cost of 94 paise.

The important parameters like plant load factor, station heat rate and auxiliary power consumption are discussed in the section below.

1. Plant Load Factor (PLF): The details of movement in PLF over the years is given in Table 7.18.

Table 7.18. Details of PLF (%)

	FY 2003-04	FY 2004-05	FY 2004-05	FY 2005-06	FY 2005-06
	Actual	Approved	Actual	Proposed	Approved
ATPS Chachai	45.9%	53.1%	47.2%	50.4%	50.7%
STPS Sarni	76.9%	75.2%	76.8%	76.1%	77.1%
SGTPS Birsinghpr	69.5%	72.7%	74.3%	74.4%	74.8%
	70.2%	71.5%	72.1%	NA	NA

Source. Tariff order issued for MPPGCL and MPSEB by MPERC for FY 2005-06

The overall PLF has shown marginal improvement from FY 2003-04 to FY 2004-05. In FY 2004-05, the Commission had approved the PLF targets as proposed by MPPGCL (then MPSEB). While the performance of PH I and II of ATPS Chachai, PH II of STPS Sarni and PH I of SGTPS Birsinghpur fell short of the target specified, yet due to better performance of other stations, MPPGCL could achieve the overall PLF target (about 0.6% higher than the target specified). However, the overall performance of generating companies continues to be unsatisfactory especially in view of the fact that the MPERC has been allowing R&M expenses as requested for generation in its orders.

2. Auxiliary Power consumption: The MPPGCL has proposed a target of 9.85% for FY 2005-06. For FY 2004-05, the MPSEB projected an auxiliary consumption of 9.51% for its stations but the approved amount was 9.11%. The details are given in Table 7.19.

Table 7.19. Details of auxiliary consumption

	FY 2003-04	FY 2004-05	FY 2004-05	FY 2005-06	FY 2005-06
	Actual	Approved	Actual	Proposed	Approved
ATPS Chachai	11.99%	9.991%	12.37%	12.02%	11.997%
STPS Sarni	9.09%	8.92%	9.15%	9.00%	8.91%
SGTPS Birsinghpr	10.54%	9.24%	10.32%	9.95%	9.79%

Source. Tariff order issued for MPPGCL and MPSEB by MPERC for FY 2005-06

The Commission fixed less stringent norms in FY 2005-06 considering the recommendations of CEA and MPPGCL's request. The Commission decided to give some more time to these units to achieve the benchmark norm as fixed by CERC for units of similar vintage. It directed MPPGCL to carry out the necessary Repairs and Maintenance expenditure and Renovation and Modernisation works.

- 3. Gross Station Heat Rates (SHR):** For FY 2003-04 the actual SHR was 3101 kCal/kWh, which showed only a slight improvement over previous year SHR of 3103 kCal/kWh. For FY 2004-05 the MPPGCL submitted 2972 kCal/kWh as target SHR. The Commission allowed 2934 kCal/kWh and the actual was 3117 kCal/kWh. For FY 2005-06, the Genco proposed 3031 kCal/kWh as SHR but the Commission in its tariff order fixed the SHR at 2850 kCal/kWh.

Power purchase

The various sources of power purchase and the units purchased along with total charges have been summarised in Table 7.20 and Table 7.21.

Table 7.20. Details of power purchase (MU)

Sources	FY 2003-04	FY 2004-05	FY 2004-05	FY 2004-05	FY 2005-06
	Actual	Proposed	Approved	Actual	Proposed
KTPS	2672	2610	2610	2904	3229
VSTPS-I	2572	2776	2776	2895	3049
VSTPS-II	1881	1935	1935	2014	2186
KGPS	1068	860	0	691	840
GGPS	673	800	800	813	788
KAPP	-	-	-	234	633
Inter regional power purchases	2426		2869	2024	1,226
Bilateral purchases	636	673	47.5	702	680
Other sources	2107	2641	2364	3409	3,341
Total	14035	15164	13401	15687	15972

Source.

- (i) Tariff order for FY 2004-05
- (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org
- (iii) Tariff order issued for MPPGCL and MPSEB by MPERC for FY 2005-06

The actual units purchased in FY 2004-05 were 15687 MU, i.e. an increase of 17% over approved units.

Table 7.21. Details of power purchase (Rs Crore)

Sources	FY 2003-04	FY 2004-05	FY 2004-05	FY 2004-05	FY 2005-06
	Actual	Proposed	Approved	Actual	Proposed
KTPS	213	230	230	245	275
VSTPS-I	338	396	396	390	414
VSTPS-II	292	320	320	306	332
KGPS	369	421	82	348	414
GGPS	224	198	198	187	200
KAPP	-	-	-	52	144
Inter regional power purchases	451	613	613	401	250
Bilateral purchases	149	188	2.14	182	177
Other sources	501	533	455	763	651
Transmission charges	143	138	126	138	145
Net	2680	3039	2424	3013	3002

Source:

- (i) Tariff order for FY 2004-05, ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org
- (ii) Tariff order issued for MPPGCL and MPSEB by MPERC for FY 2005-06

The actual power purchase cost in FY 2004-05 was Rs 3013.34 Crore, which is 24 % higher than approved levels.

The share of own generation in total requirement (power purchase and own generation) has not changed much in the last three years, infact, it has declines lightly from 50.855 in FY 2003-04 to 49.14% in FY 2004-05, despite an increase in the absolute number of units generated. The details are given in Table 7.22.

Table 7.22: Share of own generation in power purchase in total requirement (MU)

Source	FY 2003-04	FY 2004-05	2005-06
	Actual	Actual	Proposed
Own generation	14523	15154	15492
Power purchase	14035	15686	15972
Total	28558	30840	31464

Source.

- (i) Tariff order for FY 2004-05
- (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

*Includes water works HT

Trading and UI

Madhya Pradesh has bilateral purchase agreements with Rajasthan, Uttar Pradesh and Maharashtra. Bilateral purchases amounted to 636 MU in FY 2003-04 and 702 MU in FY 2004-05. The corresponding amount was Rs 149 Crore and Rs 182.50 Crore. The total UI purchase in FY 2003-04 was 180MUs amounting to Rs 79.32 Crore (Rs 4.39/kWH). In FY 2004-05,

this became 827 MU and Rs 270.36 Crore (Rs3.27/kWh). This increase in UI transaction reflects poor planning on behalf of the licensee.

Employee cost

The Board proposed an increase of 3.82% in employee costs in FY 2004-05 from actual in FY 2003-04. The Commission undertook a detailed analysis of employee costs and approved Rs 933.7 Crore as compared to proposed amount of Rs 1026.7 Crore.

In FY 2005-06, the employee cost was proposed to increase by 17% from the approved amount in FY 2004-05 and 6.50% over the actual incurred in FY 2004-05.

The details of employee costs have been summarised in Table 7.23.

Table 7.23. Employee costs (Rs Crore)

FY 2003-04	FY 2004-05	FY 2004-05	FY 2004-05	FY 2005-06
Actual	Petition	Approved	Actual	Petition
988.99	1026.73	933.70	1036.41	1093.39

Source. Tariff order for FY 2004-05

ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

Employee productivity

The trend in employee costs as a percentage of total ARR is shown in the table 7.24.

Table 7.24. Employee costs as a percentage of ARR

	FY 2003-04	FY 2004-05	FY 2004-05	FY 2004-05	FY 2005-06
	Actual	Petition	Approved	Actual	Petition
EC as a % of					
ARR	15.35%	14.29%	15.08%	14.81%	14.83%

Source. Tariff orders issued by MPERC

Petition submitted by MPSEB for FY 2005-06

Actual employee costs as a proportion of total ARR shows a consistent trend between 14-15% and not much improvement is seen in this. The employee cost per unit of sale in Madhya Pradesh is given in Table 7.25.

Table 7.25. Employee cost per unit of sale (paise/kWh)

FY 2003-04	FY 2004-05	FY 2004-05	FY 2004-05	FY 2005-06
Actual	Petition	Approved	Actual	Petition
62	61	55	61	61

Source. Tariff orders issued by MPERC
Petition submitted by MPSEB for FY 2005-06

Table 7.25 shows that though Commission approved a lower employee cost per unit of sale in FY 2004-05, the actual was in line with the proposed numbers and even in FY 2005-06, the petitioner proposed an employee cost per unit of sale of Rs 0.61.

Figure 7.4 shows the trend in two parameters of employee productivity:

(c) number of employees per thousand consumers
(d) number of employees per million kWh sold

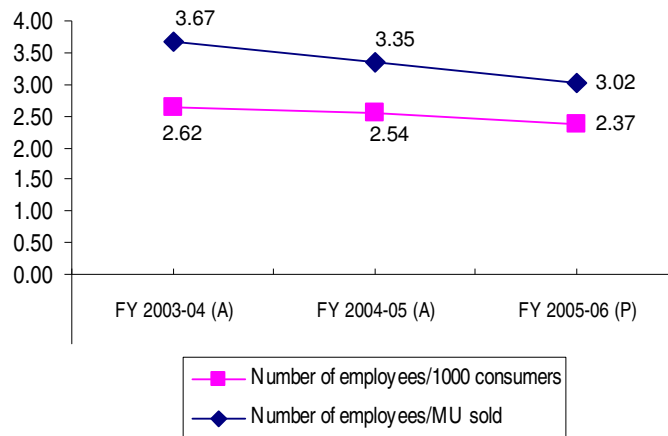


Figure 7.4. Trends in employee productivity

Source. Tariff orders issued by MPERC
Petition submitted by MPSEB for FY 2005-06

Note: Data for FY 2003-04 and FY 2004-05 is based on provisional accounts and FY 2005-06 is based on approved figures

The above parameters show a declining trend which represents improving employee productivity.

Table 7.26 gives the trend in revenue per employee. This parameter shows an increasing trend representing improving productivity.

Table 7.26 Revenue per employee

Year	No of employees	Revenue Rs Crore		Revenue/employee Rs/Employee
FY 2003-04	58774	5998	Actual	1020600
FY 2004-05	57346	6148	Actual	1072088
FY 2005-06	54392	6507	Petition	1196242

Source. Tariff orders issued by MPERC
Petition submitted by MPSEB for FY 2005-06

Repair and Maintenance expenses (R&M expenses)

Table 7.27 summarises the R&M expenses of the Board for FY 2003-04 to FY 2005-06.

Table 7.27. R&M expenses

	FY 2003-04	FY 2004-05	FY 2004-05	FY 2004-05	FY 2005-06
	Actual	Petition	Approved	Actual	Petition
\$	157.32	391.79	261.79	264.63	360.51
% of ARR	2.44%	5.45%	4.23%	3.78%	4.89%

Source: (i) Tariff order for FY 2004-05, & (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

In FY 2004-05, the proposed increase in expenses was 150% but the approved increase was only 66% from the actual expense in FY 2003-04. In FY 2005-06 the proposed increase from FY 2004-05 is 37.71% of approved number and 36% of actual.

The Commission undertook detailed analysis R&M expenditure incurred a percentage of gross block over the years. It also examined the expenses allowed by other Commissions. The Commission noted that the licensee had not incurred the R&M expenses to the extent allowed by the Commission in its previous orders. It further stated that it cannot approve expenses that are not incurred by the Licensee consistently. It also highlighted the need of repairs and maintenance and again urged the licensee to undertake timely repairs and maintenance. As a penalty for poor performance on this front, it pruned the repairs and maintenance expenses for Generation block and T&D block by Rs 50 Crore and Rs 80 Crore respectively.

The Commission also expressed its willingness to take a very favourable view of the expenses incurred by the Licensee and to true up the expenditure undertaken to the extent of 3% of the opening gross block i.e. Rs 311 Crores in its future tariff reviews including the associated financing costs based on actuals.

Figure 7.5 highlights the R&M expenditure as a percentage of the opening gross fixed asset over the years (approved figures)

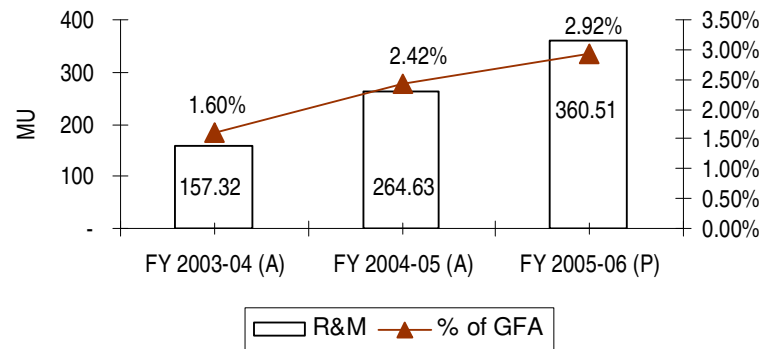


Figure 7.5. R & M expenditure as a percentage of GFA

Source. (i) Tariff order for FY 2004-05, & (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

The level of R&M expenses for ASEB ranges between 2 -3% of opening GFA as approved by the Commission.

Administration and General Expenses (A&G expenses)

For FY 2004-05, the Commission after analysing the A&G expenses in other states, approved Rs 80.60 Crore capitalisation as net A&G expenses. The Commission based this on the level of expenses (Rs 70 Crore) it had approved in FY 2002-03, which resulted in sense of 4.47 paise per unit sale in FY03. The Commission maintained the same level of expenses but with adjustments for increase at the rates of inflation of 5% for FY2003-04 and 7% for FY 2004-05 over the expenses approved in FY03. Table 7.27 summarises the A&G expenses of the Board for FY 2003-04 to FY 2005-06.

Table 7.28. Administrative & General expenses

	FY 2003-04 Actual	FY 2004-05 Petition	FY 2004-05 Approved	FY 2004-05 Actual	FY 2005-06 Petition
A&G expense (Rs Crore)	82.23*	90.37	80.60	79.98	115.08
A&G expense as a % of ARR	1.27%	1.26%	1.30%	1.14%	1.56%

Source.

(i) Tariff order for FY 2004-05,

(ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

* The ARR submitted in FY 2005-06 shows this amount to be Rs 68.85 Crore and the same has been taken to calculate the total actual ARR for FY 2003-04 in this analysis

Since the actual A&G expenses as per the petition submitted for FY 2005-06 is much lower at Rs 68.85Crore, the increase proposed and approved by the MPERC in FY 2004-05 becomes very high at 30% and 17% respectively. Figure 7.6 below gives the A&G expenses as a percentage of sales and as a percentage of total ARR.

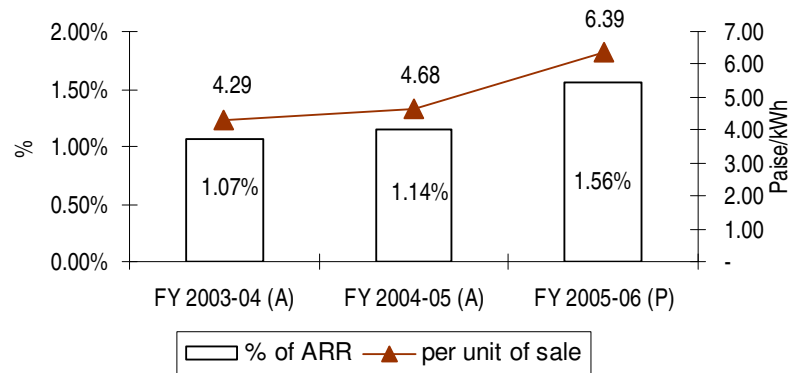


Figure 7.6. A&G expenses as percentage of ARR and per unit of sale (paise/kWh)
Source.

- (i) Tariff order for FY 2004-05
- (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

The A&G expenses have shown a consistent increase over the years increasing from 4.29 paise/kWh in FY 2003-04 to 6.39 paise/kWh in FY 2005-06 (proposed). It was 1.10% of ARR in FY 2003-04 and it has increased to 1.54% in FY 2005-06.

The A&G expense has increased as both per unit of sales and as percentage of ARR. This shows decrease in efficiency improvement of Board in A&G expenses.

Total operating expenditure (Employee costs, R&M expenses and A&G expenses)

The Operation and Maintenance expenditure primarily consists of three major heads, namely employee costs, R&M expenses and A&G expenses. Table 7.29 gives a consolidated picture of the movement in O&M expenditure over the years.

Table 7.29. Operating expenditure over the years

	FY 2003-04 Actual	FY 2004-05 Petition	FY 2004-05 Approved	FY 2004-05 Actual	FY 2005-06 Petition
O&M Expenditure (Rs Crore)	1214.96	1507.62	1276.09	1381.02	1568.98
O&M expenditure as % of ARR	18.86%	20.98%	20.61%	19.73%	21.29%

Source.

- (i) Tariff order for FY 2004-05
- (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

The O&M expenses have been in the range of 18-20% during the period of analysis of this study. The actual has increased from 18.86% in FY 2003-04 to 19.73% in FY 2004-05.

Depreciation

The licensee proposed Rs 476.2 Crore as depreciation in FY 2003-04 and Rs 502.18 Crore for FY 2004-05. The licensee submitted that this was based on norms issued under the Electricity (Supply) Act, 1948 at the rate of 4.85% of the opening gross block of asset for the year.

The Commission utilized the services of an independent CA firm to verify the gross block and depreciation figures submitted by the licensee with the corresponding figures in the Trail Balance maintained by the licensee. The CA firm conducted the verification exercise at Jabalpur, Indore, Birsinghpur and Sirmaur. The firm commented the books and accounts of the licensee were not properly arranged and hence it was difficult for the Licensee to provide proper supporting documents. The Commission again directed the MPSEB to prepare and maintain proper records for assets in a form where the age and physical location of assets are available and to take care to avoid anomalies such as depreciation being charged on the assets beyond 90% of its cost of acquisition.

To estimate the opening gross block for FY2004-05, the Commission took the closing gross block for FY 2001-02 (latest audited statements available at that time) and added the asset additions for the subsequent years and depreciation as submitted by the Licensee. The Commission approved a depreciation rate of 4.85% as proposed by the Board as it was in line with the historic trend of depreciation.

Table 7.30 gives the details of depreciation from FY 2003-04 to FY 2005-06.

Table 7.30. Details of depreciation from FY 2003-04 to FY 2005-06 (Rs Crore)

FY 2003-04	FY 2004-05	FY 2004-05	FY 2004-05	FY 2005-06
Actual	Petition	Approved	Actual	Petition
476.20	502.18	502.18	533.41	599.25
Basis	Norms issued under E(S) Act, 1948			

Source

- (i) Tariff order for FY 2004-05
- (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

The actual depreciation charged to accounts by MPSEB in FY 2004-05 was however higher than the proposed and the approved amounts.

Investment in transmission and distribution segments

In MP most of the power is generated in eastern part but the major consumption is in western part necessitating transmission over long distances. A sound transmission network is also necessary for delivery of reliable and quality power to end-users. The Commission recognising the importance of reliable transmission network has initiated massive investment in this sector with funding from ADB, NABARD & PFC.

A snapshot of the transmission network in MP as on 31st March 2005 is given below in Table 7.31.

Table 7.31. Snapshot of transmission network

Voltage (KV)	Particulars		
	Transmission line (Ckt.KM)	EHV substations No.	MVA
<i>As on 31st March 2004</i>			
400	1723.51	4	2940
220	6740.71	28	7730
132	9842.54	138	9799
66	61	1	20
<i>As on 31st March 2005</i>			
400	2314.31	4	3255
220	6880.22	33	8530
132	10055.04	139	10007.5
66	61	1	20

Source.

- (i) Tariff order for FY 2004-05
- (ii) Transmission Tariff order for FY 2005-06

The expected addition that was to be made in FY 2005-06 is summarised in Table 7.32.

Table 7.32. Transmission capacity addition plan

Particulars of works	2005-06 (Proposed)		
	Rs Crore Tied up works	Rs. Crore Un-tied up works	Rs. Crore Total
400kV Lines	-	-	-
400kV S/s	7.90	-	7.90
220kV Lines	173.30	2.10	175.40
220kV S/s	67.63	1.16	68.79
132kV Lines	107.35	-	107.35
132kV S/s	95.42	7.65	103.07
Total	451.60	10.91	462.51

Source. Transmission tariff order for FY 2005-06

Capital expenditure

Table 7.33 summarises the capital expenditure of licensee during FY 2001-02 to FY 2003-04.

Table 7.33. Capital expenditure

Particulars	FY 2001-02	FY 2002-03	FY 2003-04
	Rs. Crore	Rs. Crore	Rs. Crore
	Actual	Actual	Proposed
Generation	24.8	17.65	304.2
Transmission & distribution	29.41	74.05	445.48
Total	54.21	91.7	749.68

Source. Tariff order for FY 2004-05

The capital expenditure in transmission and distribution segment increased at from Rs 29.41 Crore to Rs 974.05 Crore from FY 2001-02 to FY 2002-03, while that in generation segment declined from Rs 24.8 Crore to Rs 17.65 Crore. Given the severe energy shortages in Madhya Pradesh, greater emphasis needs to be laid on increasing installed capacity within the state.

Sources of funds

The Madhya Pradesh power sector reforms have been funded by ADB and DFID. In the first phase of reforms, the ADB support has two components: (i) a policy loan of US \$150 million, and (ii) an investment loan of US \$200 million. DFID is supporting the Madhya Pradesh Electricity Regulatory Commission, Madhya Pradesh Electricity Distribution companies, Madhya Pradesh Transco, GoMP Energy Department, and MP Power Operating Companies for MIS/IT Accounting and billing.

APDRP

As per the Accelerated Power Development & Reforms Program (APDRP) in Madhya Pradesh, the State of MP is divided into 3 Kshetras consisting of revenue circles. The overall sanctioned amount to the state under the scheme is Rs.663.20 Crore out of which Rs.129.87 Crore has been released as on 30th June 2006. The total amount utilised so far is Rs.215.72 Crore, i.e., 32.53%. Figure 7.7 shows the circle wise status of APDRP scheme in state of MP.

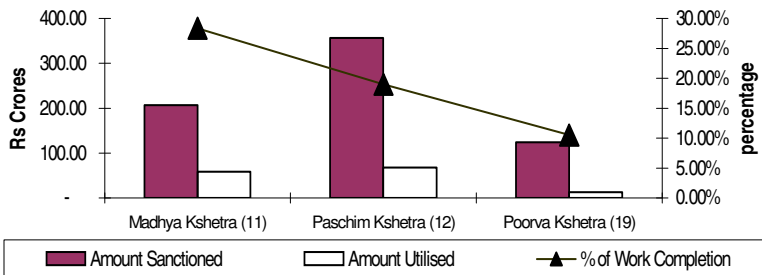


Figure 7.7. Circle wise status of APDRP scheme

Source. www.apdrp.com

Interest and finance charges

The MPSEB proposed Rs 539.78 Crore as interest and finance charges for FY 2003-04 and Rs 369.47 Crore for FY 2004-05 and. It submitted that it had taken a number of steps to reduce its interest liabilities through refinance and restructuring of loans. It submitted that through restructuring and settlement, it had reduced interest liability on account of PFC loan by Rs 84.27 Crore. It further submitted that REC had agreed to waive the liability of Rs 773.65 Crore and it had also entered into agreements and settlements with LIC, HDFC and CAN Fin. Home Finance Ltd. Resulting in benefits of Rs 1.09 Crore, Rs 0.83 Crore and Rs 0.71 Crore respectively.

The Commission did not approve the amount proposed by the Board. It analysed the various components of the debt to verify the interest charges submitted by the licensee. It highlighted the fact that 32% of the debt of the licensee was on account of principal overdue and interest overdue and that the licensee had to pay higher interest rates on account of penalty clauses on overdue components on most loan schemes. The Commission further stated that the licensee has not been able to pay its interest due to poor collection. It did not allow the amount of Rs 124.65 Crore due on account of overdue interest.

The Commission also reduced the interest payable to the extent of Rs 26 Crore that was on account of delay in disbursements to loan from PFC and state government. It also disallowed the formation of regulatory asset of Rs 49.5 Crore proposed by the licensee as the audited accounts for FY2002-03 and FY2003-04 were not submitted. Table 7.34 gives the details of interest and finance cost for FY 2003-04 and FY 2004-05.

Table 7.34. Interest and finance charges (Rs Crore)

S. No	Details	FY 2003-04	FY 2004-05	FY 2004-05
		Actual	Proposed	Approved
1	Govt. borrowings	61.79	107	93.08
2	Other borrowings			
A	PFC	163.04	126.23	114.11
B	REC	270.46	0	0
C	Others	353.72	351.23	351.23
2	Total (Other borings)	787.22	477.46	465.34
3	Interest disallowed on overdue components and regulatory asset			174
4	Finance and bank charges	92.47	59.96	59.96
5	Total	941.48	644.43	444.38
6	Less capitalisation	-401.7	-274.96	-189.60
7	Net interest and finance charges	539.78	369.47	254.78

Source. Tariff order for FY 2004-05

The approved amount by the Commission was 68% of the proposed amount by MPSEB. Table 7.35 gives the details of the proposed, approved and actual cost on account of interest and finance charges from FY 2003-04 to FY 2005-06.

Table 7.35. Interest and finance charges from FY 2003-04 to FY 2005-06 (Rs Crore)

FY 2003-04	FY 2003-04	FY 2004-05	FY 2004-05	FY 2004-05	FY 2005-06
Actual	Actual	Petition	Approved	Actual	Petition
539.78	660.74	369.47	254.78	451.88	525.38

Source. (i) Tariff order for FY 2004-05, & (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

There has been a decline in interest charges in FY 2004-05 from the actual charges in FY 2003-04; however, they still remain higher than the approved figures by MPERC.

Bad debts and prior period charges

Table 7.36 shows the details bad debts and prior period expenses from FY 2003-04 to FY 2005-06.

Table 7.36. Details of bad debts (Rs Crore)

S. No	Details	FY 2003-04	FY 2004-05	FY 2004-05
		Actual	Proposed	Approved
1	Bad debt written off/provided for	301.18	175	20.5
2	Miscellaneous losses and wrote off	1.44	1.44	1.44
3	Net prior period credit/charge	-21.87	-21.87	0
4	Total	280.74	154.56	21.9

Source.

(i) Tariff order for FY 2004-05

(ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

In FY 2004-05, the Commission allowed Rs 20.5 Crore as provision for bad debt written off/ provided for based on the actual write-offs in the past years. It also advised the MPSEB to scrutinise its unrealised dues that are more than one year's sales revenue and formulate a clear and transparent policy for writing off bad debts.

The actual bad debt in FY 2004-05 was Rs 23.97 Crore and MPSEB proposed Rs 24.06 Crore for FY 2005-06. This represents 0.35%, 0.34% and 0.33% of the ARR in the respective years.

Statutory return

For FY 2004-05, the MPSEB proposed Rs 134.43 Crore as return on net fixed assets. The same was approved by the Commission. The actual return that it claimed as per the

petition for FY 2005-06 was Rs 152.36 Crore and it further proposed a return of Rs 175.38 Crore for FY 2005-06. The licensee had proposed that it will change the method of calculation of Rate of Return as a percentage of Net Fixed Assets to a Return on Equity once independent companies file separate tariff petitions. However, since it did not do so in FY 2005-06, it continued with the return on net fixed assets for FY 2005-06 also.

Total Annual Revenue Requirement

The total ARR of MPSEB from FY 2003-04 to FY 2005-06 is given in Table 7.37.

Table 7.37. Total ARR of MPSEB from FY 2003-04 to FY 2005-06 (Rs Crore)

Items	FY 2003-04	FY 2004-05	FY 2004-05	FY 2004-05	FY 2005-06
	Actual	Petition	Approved	Actual	Petition
Power purchase cost	2679.84	3038.73	2423.40	3013.33	3002.30
Fuel cost for power generation	1250.77	1479.06	1578.30	1443.33	1479.06
Employee cost	988.99	1026.73	933.70	1036.41	1093.39
Repairs and maintenance cost	157.32	391.79	261.79	264.63	360.51
Administration and general expenses	68.65	89.10	80.60	79.98	115.08
Interest & finance charges	660.74	369.47	254.78	451.88	525.38
Depreciation	476.20	502.18	502.18	533.41	599.25
Provision for doubtful debts	23.33	154.56	21.90	23.97	24.06
Statutory return/ Return on equity	137.09	134.43	134.43	152.36	175.38
Total expenditure	6442.93	7186.05	6191.08	6999.30	7374.41

Source:

- (i) Tariff order for FY 2004-05
- (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

The ARR approved by the Commission in FY 2004-05 was 86.15% of the ARR proposed. However, the actual ARR, though lower than proposed was higher than the approved figures of MPERC. The actual ARR was 113% the approved ARR in FY 2004-05.

In FY 2005-06, the MPSEB proposed an increase of 19% over the approved ARR of FY 2004-05. This amounted to an increase of 5.29% over the actual ARR for FY 2004-05. Figure 7.8 gives the trend in ARR (without subsidy and non-tariff income) from FY 2003-04 to FY 2004-05)

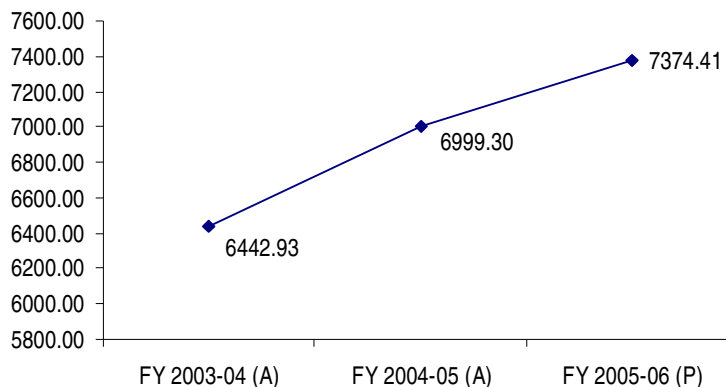


Figure 7.8. Trend in ARR (without subsidy and non tariff income)

Source:

- (i) Tariff order for FY 2004-05
 - (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org
- *A- Approved
P-Proposed

Tariff rationalisation

Approach to tariff determination

The Commission issued a paper on tariff philosophy in December 2003 which discussed issues like cost of supply, cross subsidy, need for tariffs to reflect season dependent cost of power, incentives for metered consumption etc.

In FY 2004-05 order, the Commission gave prime consideration to the 'Cost of Supply' while designing the tariff structure. At the same time, it recognised the need to strike a balance between the affordability to the consumers and reasonable recovery by the licensee.

In the absence of adequate information and cost details with respect to individual consumer classes, the Commission adopted the 'Cost of Supply' for specific consumer categories and voltage levels as determined by the licensee, adjusted to the respective cost details under the ARR as it approved. The Commission decided to analyse the appropriateness of the allocation factors for determining 'Cost of Supply' as and when the Licensee would make the relevant data available. The Cost of Supply as per this is given in Table 7.38.

Table 7.38. Category wise cost of supply for FY 2004-05

Categories	CoS		Average tariff
	Petition	Approved	Approved
FY 2004-05	Rs./kWh	Rs./kWh	Rs./kWh
LT			
Domestic/SLP	4.9635	4.2525	3.14
Non-Domestic	4.9635	4.2525	5.85
Water works	4.9635	4.2525	2.93
Industrial	4.9635	4.2525	4.91
Agricultural	4.9635	4.2525	2.18
Street lights	4.9635	4.2525	3.42
HT			
Railways	1.7492	1.6906	4.49
Coal mines	2.0736	2.0041	5.14
Mini steel plants	2.0736	2.0041	3.68
Cement	2.2899	2.1704	4.51
Irrigation/Water works	2.2899	2.1704	6.86
Other HT consumers	1.9792	2.0469	4.70
RE Co. Society	2.2899	2.1704	2.00
Border villages	2.2899	2.1704	2.52

Source: Tariff order for FY 2004-05

The average cost of supply approved by the MPERC for FY 2004-05 was Rs 3.67/kWh as compared to Rs 4.30/kWh proposed.

In FY 2005-06, the Commission examined the integrated tariff petition activity-wise so that the cost of operation could be ascertained separately for generation, transmission and distribution. However, with the provisional opening balance sheet of the various companies provided by the GoMP, the companies were to file their tariff petition on the basis of the provisional balance sheet. The order of the GoMP also stipulated that these balance sheets shall be provisional for a period of twelve months and during the provisional period. It further states that the GoMP may change the values stated in the opening balance sheets including but not limited to value assigned to the fixed assets, capital expenditure in progress, regulatory assets towards pension liabilities, project specific liabilities, and loan from MPSEB etc.

In view of the above, the Commission considered that no useful purpose will be served at that stage by devoting much time over detailed analysis of the tariff proposal filed by the erstwhile MPSEB as a composite entity particularly in view of the fact that the successor entities are yet to file their tariff petitions. The bulk supply tariff had been fixed on a differential basis to the three Discoms to take care of the consumer mix and prevailing loss levels in the operating areas of these companies. Hence the

retail supply tariff was uniformly applied to the entire State for the FY 2005-06.

However, during the public hearings, consumers brought many issues to the attention of the Commission, which the Commission considered necessary to be taken care of while finalising the Tariff Order for FY 2005-06. Pending filing of the tariff petition by the companies, the Commission decided to continue with the existing tariff structure for different categories of consumers but based on the feedback received during the public hearings, it made some alterations in some categories, subject to such changes, alterations/modifications as may become necessary on the basis of proposals to be filed by the licensees and Generating Company.

Category wise average tariff:

Figure 7.9 shows the category wise average realisation from tariffs for FY 2003-04, 2004-05 and FY 2005-06.

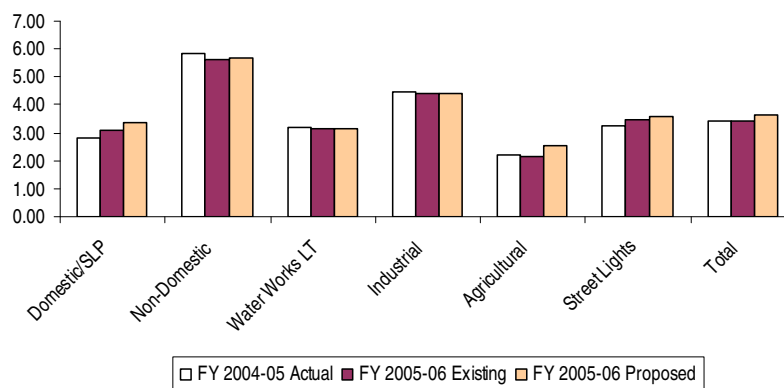


Figure 7.9. Category wise average tariff

Source.

- (i) Tariff order for FY 2004-05
- (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

The licensee proposed an increase of 6% over the existing tariff in FY 2005-06. The tariff order issued did not estimate the revenue implications of the changes the Commission made and therefore the approved numbers are not available. In FY 2004-05, the Commission increased the tariff for agricultural consumers without an energy meter and reduced the tariff for metered consumers. The actual overall average tariff in FY 2004-05 increased to Rs 3.40/kWh from Rs 3.03/kWh in FY 2003-04.

Tariff rationalisation and new initiatives in tariff design

In case of Madhya Pradesh extensive tariff rationalisation was required and it was necessary that tariffs of all consumer categories except for financially weak consumer to reflect minimum 75% of average cost to supply of that category by July 2006.

The various rationalization measures approved by the Commission in FY 2004-05 are given below:

4. Withdrawal of prevailing telescopic tariffs and introduction of non-telescopic tariff structure for domestic and non-domestic consumer category. This means that a domestic consumer shall pay uniform rate against the entire consumption.
5. Introduction of a 'Lifeline consumers' category for domestic consumers consuming upto 30 units a month (metered connections only)
6. Merger of category of 'Licensee Employees' with domestic consumers provide equal treatment to consumers of similar nature.
7. Introduction of consumption-linked/unit-linked fixed charge. The fixed charges applicable to a consumer during the financial year, is determined based on the slab under which the consumer's average monthly consumption during the previous calendar year falls
8. Introduction of fixed kW based charge for water works
9. Introduction of demand based tariff for LT industrial consumers
10. Separate tariff for metered and unmetered agricultural consumers with a higher tariff for unmetered and tariff for metered reduced to encourage metering

Other new initiatives introduced in tariff structure are discussed below:

1. **Time of day and seasonal tariff:** The tariff structures in the state already had **Time of Day tariff (ToD)** and seasonal tariff for HT consumers. However, in the existing schedule in FY 2004-05, TOD tariff was optional for the consumers. The consumers opting for TOD tariff had to pay 130% of the normal charge for energy consumed during the peak hours (from 5 PM to 10 PM). There was no rebate for off peak consumption. Similarly consumers not opting for TOD tariff had to pay 160% of the normal rate for the energy consumed during peak hours and 90 % of the normal rate for the energy consumed during off-peak load period (10 PM to 6 AM next day). The Commission made it mandatory for all the consumers to opt for TOD tariff at single TOD tariff. The surcharge for consumption during the peak hours was reduced from 30% to 15% because the

energy charges of this consumer category were higher than the costliest variable energy purchase allowed by the Commission. A rebate of 5% of the energy charge was given for consumption during the off peak hours in order to incentivise consumers to shift their demand during these hour. In FY 2005-06, the Commission increased this rebate to 7.5%.

2. **Multi year tariff:** The MPERC has issued the regulations for determination of Multi Year tariffs. These regulations specify principles/ norms/ benchmarks for determination of various costs and other relevant parameters for Generation, Transmission and Distribution. The terms and conditions are based on multi year tariff principles applicable for each year of the control period specified for generating company (5 years), transmission licensee (5 years) and distribution licensee (3 years). While drafting the regulation MPERC took into consideration the following principles: (i) Methods and principles used by CERC in framing regulations for Central Sector generating companies and Central sector transmission licensees, (ii) promotion of competition, efficient working of the utilities and consumers' interest, (iii) tariffs to progressively reflects the cost of supply (iv) promotion of generation from renewable resources.

The Commission has already issued the MYT order for transmission and generation for FY 2007-09. The distribution licensees have submitted their petitions for determination of tariff fir the period FY 2007-08 to FY 2009-10 (remaining period of the first control period).

3. **Promotion of renewables:** In the public hearing in FY 2004-05, a submission was made to provide incentives in tariff to those customers who had adopted solarizers and solar water heaters which are electricity saving device. Though the MPSEB agreed that the use of non-conventional renewable energy should be promoted, it stated that such promotions are policy issues and within purview of GoMP. The Commission was in agreement with the proposal for encouraging use of non-conventional sources of energy and promoting energy saving equipment. It has already issued an order on minimum procurement of energy from wind energy sources and has also provided incentives for use of energy efficient devices for agriculture pumps, which aid in demand side management. The Commission stated that it would consider any proposal by the Board for incentives on use of solarizers in future. However, no such incentive was introduced in the FY 2006-07 order also.

Cross subsidy

Cross subsidy levels in Madhya Pradesh have been estimated using both average cost and voltage wise of cost of supply. The trends in these are given in Table 7.39 and Table 7.40.

Table 7.39. Trend in cross subsidy based on average costs (Cross subsidy= Average tariff/Average cots) (%)

Categories	Cross subsidy	Cross subsidy	Cross subsidy
	FY 2004-05	FY 2004-05	FY 2005-06
LT	Approved	Actual	Existing
Domestic	85%	79%	78%
SLP	92%	86%	80%
Non-Domestic	160%	149%	142%
Water Works	80%	75%	79%
Industrial	134%	125%	123%
Agricultural	59%	56%	53%
Street Lights	93%	87%	88%
HT			
Railways	122%	115%	112%
Coal mines	140%	131%	121%
Mini Steel plants	97%	91%	79%
Cement	123%	115%	105%
Irrigation HT	187%	175%	247%
Water Works HT	71%	66%	69%
Other HT consumers	128%	119%	120%
RE Co. Society	54%	51%	51%
Border Villages	68%	64%	63%

Table 7.40. Trend in cross subsidy based on voltage wise cost of supply (%)

Categories	Cross subsidy	Cross subsidy	Cross subsidy
	FY 2004-05	FY 2004-05	FY 2005-06
	Approved	Actual	Existing
LT			
Domestic	73%	64%	63%
SLP	79%	69%	65%
Non-Domestic	138%	121%	116%
Water Works	69%	61%	64%
Industrial	115%	101%	100%
Agricultural	51%	45%	43%
Street Lights	80%	71%	72%
HT			
Railways	266%	222%	214%
Coal mines	256%	233%	211%
Mini Steel plants	177%	161%	138%
Cement	208%	181%	161%
Irrigation HT	317%	275%	381%
Water Works HT	120%	104%	106%
Other HT consumers	229%	188%	184%
RE Co. Society	92%	80%	78%
Border Villages	115%	100%	97%

Note: Category wise CoS for FY 2003-04 is not available

Since the tariff order for FY 2005-06 did not give any details on CoS approved and average tariff approved, the proposed numbers by the licensee have been presented above. From the above tables it is clear that there was tariff rationalisation and reduction in cross subsidy from FY 2003-04 to FY 2004-05. Further, since the Commission did not accept the petition of the licensee, the tariff proposed by them was not accepted and the Commission continued the FY 2004-05 tariffs in FY 2005-06 also with slight modifications. However, the extent to which cross subsidy levels were impacted by this is not available.

Convergence Index (CI)

Figure 7.10 indicates the trend in CI for Madhya Pradesh from FY 2003-04 to FY 2005-06.

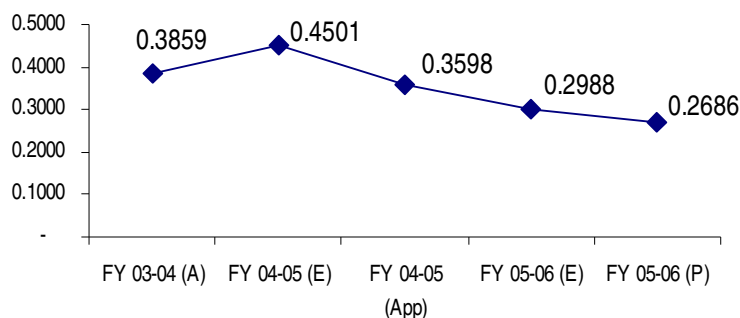


Figure 7.10. Convergence Index

Source. TERI calculations

A : Actual, E : Existing, App : Approved, P : Proposed

Figure 7.10 indicates the trend in CI in Madhya Pradesh FY 2003-04 to FY 2005-06. Again the figures for FY 2005-06 are proposed, as the Commission did not rationalise tariff structure for this year. The CI is improved marginally during the period of the study, though the improvement was higher in the FY 2004-05 than in FY 2005-06.

Subsidy support from Government

Table 7.41 summarizes the position as regards subsidy received from GoMP to bridge the revenue gap.

Table 7.41. Subsidy support from government (Rs Crore)

Particulars	FY 2001-02	FY 2002-03	FY 2003-04	FY 2004-05	FY 2005-06
Balance subsidy due from previous year	1480	348	165	6	6
Subsidy due for the year	543	668	890	778	661
Total subsidy receivable	2023	1016	1055	784	667
Total subsidy received	1676	851	1049	778	-
Balance subsidy receivable	348	165	6	6	667

Source. (i) ARR proposal as filed by MPSEB

(ii) Website of MPERC, www.mperc.org

In FY 2003-04, subsidy due to be received by GoMP was only Rs.890 Crore but the Government paid Rs.1049 Crore or 118% of due amount. The amount due in FY 2004-05 was Rs.778 Crore and amount received was 100% of due amount. In FY 2005-06, amount due was Rs.661 Crore but the received amount was nil. Figure 7.11 shows the trend in subsidy received from GoMP for a ten-year period from FY 1996-97 to FY 2005-

06. It shows a constant increasing trend till FY 2003-04 and then declines in FY 2004-05 and FY 2005-06.

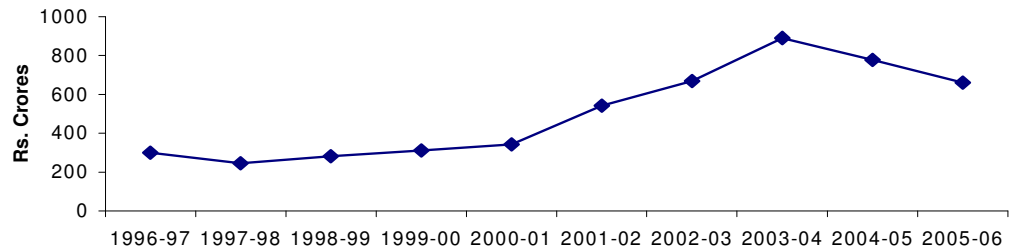


Figure 7.11. Trend in subsidy received

Source: (i) Annual report (2001-02) on the working of SEBs and Electricity Departments by Power and Energy Division- Planning Commission, GoI; (ii) ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

In addition to the above, the State Government also provides capital grant to the Board. The amount of capital grant received by the Board during FY 2001-02 and as proposed to be received in FY 2005-06 is given in the Figure 7.12.

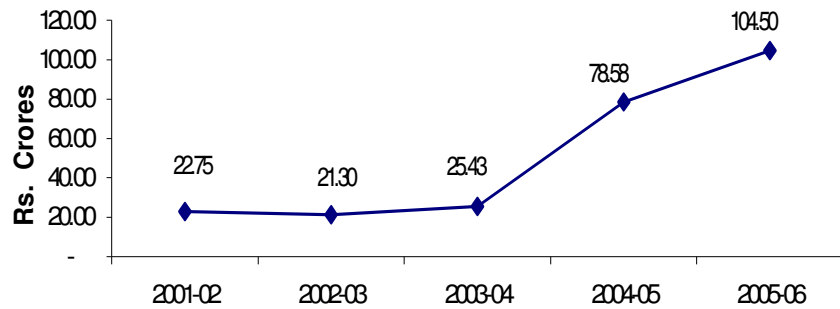


Figure 7.12. Capital grant

Source. ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

Capital grant has also shown an increasing trend from FY 2001-02 to FY 2005-06.

Revenue gap

Table 7.42 summarises the revenue gap for FY 2003-04 to FY 2005-06.

Table 7.42. Revenue gap

	FY 2003-04	FY 2004-05	FY 2005-06
Details	Actual	Actual	Proposed
Total revenue requirement (Rs Crore)	6269.30	7051.57	7485.80
Total revenue (Rs Crore)	5998.47	6147.99	6873.90
Revenue gap (Rs Crore)	-270.83	-903.57	-611.90
Revenue gap (%)	-6%	-18%	-10%

Source. Tariff order for FY 2004-05, ARR proposal as filed by MPSEB, Website of MPERC, www.mperc.org

The revenue gap has gone up from Rs 270.83 Crore in FY 2003-04 to Rs 903.57 Crore in FY 2004-05. This clearly shows that not only has there been no improvement, but also a clear deterioration in the financials of the licensee. The Commission may therefore have to relook the targets set for loss reduction and other costs elements or the state government will have to increase its support.

The licensee proposed that the revenue gap of FY 2002-03 and FY 2003-04 be treated as a Regulatory Asset. It also proposed to amortize this regulatory asset over a period of five years, starting from FY 07, if the hikes required during these years after including the 1/5th amount in respective years do not lead to a tariff shock. In case the hikes required due to inclusion of these expenses leads to a tariff shock, it would submit a separate treatment. Further, the Licensee also submitted that till this “Regulatory Asset” is fully amortized, interest on the same might be permitted, as the Licensee will have to incur the expenses.

The Commission desisted from determining the controllable and non-controllable expenses for FY 2003-04 and FY2004-05 in the order and did not take any decision on the request for creation of regulatory asset. However, it stated that the same may be determined and awarded by the Commission at a later date, as and when the audited accounts are made available by the Licensee or its successor entities and the reason for not obtaining prior approval of the Commission for ARR are explained to the satisfaction of the Commission.

Governance

Timeliness of tariff orders

The tariff petition for FY 2004-05 was finally submitted by the petitioner on August 26, 2004. The order was issued by the Commission on December 10, 2004, i.e., within a period of 105 days. The tariff petition for FY 2005-06 was accepted on March 21, 2005 and the order was issued on June 29, 2005, i.e. in 100

days. The Commission has therefore issued both the orders in time, within the limit of 120 days as given by the Electricity Act 2003.

Public participation

In FY 2004-05, the Commission received 55 objections to the ARR submitted for FY 2003-04 and FY 2004-05. The Commission held a public hearing for all consumers other than agricultural consumers in Bhopal on one day and for agricultural consumers on another day.

In FY 2005-06, the Commission received 104 comments/suggestions/objections on the petition submitted. The hearings were held over 4 days and on the basis of the issues raised, the Commission also approved a few modifications in the tariff rates and structure.

The Commission convened a meeting of its State Advisory Committee before the issue of the tariff orders mentioned above.

Staffing

The state government has sanctioned the revised set up of MPERC in August 2006 and with this the MPERC may not face many problems as far as staffing is concerned. The revised set up consists of 22 officers apart from the Chairman and two members. Also a number of support staff has been approved. The staff strength of the Commission is thus likely to become adequate if officers for all the posts are appointed.

Status of directives issued by MPERC

The Commission in its various tariff orders had given several important directives to the licensee on improvements in operational and financial performance and customer services. The Commission in its Tariff Order of FY 2005-06 also pointed out that the Board has not comprehensively responded to the observations and directives given by the Commission in its earlier tariff orders. Some of the important directives related that it has issued so far relate to the following:

- (a) Maintenance of Asset Registers
- (b) Reduction of T&D Losses
- (c) Estimation of Agriculture category consumption
- (d) Prior Approval of Commission for Power Purchases
- (e) Status of Border Villages
- (f) Manpower Planning
- (g) Arrangements for better consumer care
- (h) Modification of R-15 (Revenue monitoring) formats
- (i) Reduction in transformer failure
- (j) Improvement of Recovery and liquidation of arrears
- (k) DTR metering

- (l) Consumer metering
- (m) Timely intimation to consumers regarding bills by SMS
- (n) Energy Auditing
- (o) Introduction of spot billing
- (p) Appointment of Reporter of Compliance

The Commission has not given the status of compliance of these directives in the FY 2006-07 order. However, it states that it has been regularly monitoring the implementation of these directives but is constrained to point out that all distribution licensees are not moving forward with equal alertness and dedication. The Commission further states that it will consider further delay in ensuring satisfactory compliance as a matter fit for action under the provisions of the Act.

Studies undertaken

The details of the major studies undertaken by the MPERC are given in Table 7.43.

Table 7.43. Studies undertaken by MPERC

S. No.	Purpose of study	Period
1.	Investigation regarding depreciation, interest and finance charges claimed by the Board	One month
2.	To verify that the expenditure items listed by MPSEB for FY-03 & FY-04	One month
3.	Study of load factors of HT/LT industries in the State of M.P.	Two months
4.	Assist Generation Tariff Determination	Two months
5.	In the matter of terms of reference for appointment of an investigator to look into the matter of coal shortages	Five months
6.	To assist the Commission on the issues related to metering and energy accounting	Three months
7.	To assist the Commission on the issues related to metering and energy accounting	Three months
8.	To assist the Commission on the issues related to metering and energy accounting	Three months
9.	Investigation of Employees Expenses incurred by Licensees and Generating Company	124 days

The MPPTCL also carried out a Load Flow Study in 2005.

Consumer advocacy and redressal mechanism

The regulation for the Establishment of Forum and Electricity Ombudsman 2004 was first issued by the Commission in April 2004. This was subsequently amended and the Madhya Pradesh Electricity Regulatory Commission (Establishment of Forum and Electricity Ombudsman for Redressal of Grievances of the Consumers) Regulations, 2004 was finalised after two amendments in September 2006.

The Commission has also issued the Distribution standards performance and for Transmission performance standards. These regulations lay down the parameters to assess the performance and also prescribe the penalty to be paid by the licensees in case of underperformance.

The Ombudsman was appointed by the Commission as per the provisions of section 42 (6) of Electricity Act 2003. The Ombudsman commenced functioning from February 2005 and continued up to September 2005 (charge relinquished). The Commission issued an advertisement in the month of October 2005 for appointment of a new Ombudsman; however, looking to the lack of adequate response, the Commission again issued an advertisement in the month of February 2006. The appointment of Ombudsman has been finalized and it is expected that a new Ombudsman will be soon take over the charge.

The GoMP has implemented most of the aspects required under the Electricity Act. These include setting up of special courts, nomination of assessing officers in the Distribution Companies (Discoms) and the constitution of District Level Committees.

The three distribution licensees have also set up the consumer redressal forums. The details of the cases addressed by the forum (as on March 31st, 2006) are given in Table 7.44.

Table 7.44. Details of the cases addressed by the Consumer Redressal Forum

Distribution Company	Complaints pending on the beginning of the year	Complaint received during the year	Complaint settled during the year	Complaint pending as on 31.3.2006
Poorv Kshetra	124	1211	1141	194
Paschim Kshetra	45	722	651	116
Madhya Kshetra	301	723	813	211

Source. MPERC

Cases and appeals

The Appellate Tribunal has so far issued orders on the following cases with respect to the MPERC.

1. Vikram Cement (Unit of Grasim Industries Ltd.) versus MPERC and Madhya Pradesh Paschim Kshetra Vidut Vitaran Company. In this appeal, the appellant challenged the levy of maintenance charges on feeder line extending to the factory of the appellant on the ground that the same is violative of the provisions of Madhya Pradesh Electricity Supply Code. The Tribunal allowed the order of

the Commission to the extent that it allowed the levy of maintenance charges to be paid to the Board at the rate of 1% per month of the actual cost of the extension is set aside, in respect of the consumers who have paid for the dedicated feeder/feeder line, but the licensee is using the same dedicated feeder/feeder line for supply of energy to other consumers as well and the appeal was disposed of accordingly. This order was issued on September 28, 2006.

2. M.P. Madhya Kshetra Vidyut Vitran Co. Ltd versus MPERC and Anr. This appeal was directed against the order of the MPERC (June 21, 2006) whereby it was held that the tariff schedule, HV-5.4.1 was applicable for determination of tariff of the second respondent. The Tribunal allowed the appeal and set aside the order of the Commission, dated June 21, 2006 and ordered that the second respondent shall be charged as per tariff item 5.4.2 of the tariff schedule HV 5, with effect from the date of implementation of the tariff order dated March 31, 2006
3. Appeal against Tariff Order for 2005-06 was filed by Electricity Consumers Society regarding the truing up exercise with reference to FY 2005-06. The Tribunal ordered the MPERC to afford an opportunity of hearing to the Appellant before arriving at any determination in the truing up exercise. It further ordered that the truing up exercise shall be undertaken by the Commission expeditiously and shall be concluded within three months from the date the data is supplied by the distribution companies to the Commission and that the distribution companies shall be duty bound to supply the data to the Commission within three weeks from the date of the receipt of a copy of the Tribunal's order.

An appeal against Tariff Order dated 31.3.2006 has been filed by Electricity Consumers Society in the Appellate Tribunal, New Delhi hearing on which is in progress in the Appellate Tribunal.

Directives issued by the state government

Details of the directive issued by the State Government in 2006 are as follows.

In the matter of Procurement of Additional Short Term Power by the Distribution Licensees of the State the Commission vide order dated 29th September 2006 fixed the ceiling price of 110% of the highest price of the State sector thermal generation station when the electricity is procured within the State and 110% of the highest price of coal fired thermal power stations of Central Sector when purchase is from sources outside the State.

The State Government had informed vide letter dated 2nd November 2006 that the decision shall adversely affects on the economy of the State due to non-availability of adequate power and unprecedented load shedding may even occur law and order problem in the State. Further the State Government has stated that in the public interest to issue the following directions to MPERC under Section 108 of the Electricity Act, 2003:

1. Remove the price band for purchase of short-term power fixed vide Order-Sheet passed on September 29th 2006.
2. Allow the utilities to purchase the power on short term basis based on the evaluation of the demand-supply projection submitted to the Commission, and
3. Consider the additional expenses incurred by the licensees, due to short-term power purchase, while computing the future ARR.

Anti theft measures

A number of anti-theft measures have been undertaken in the state including setting up of special courts and constitution of anti-theft squads. Other technical measures taken up by the discoms include replacement of LT line with bare conductor by cable, shift of meters from the interior of the building at the entrance point of the building in many cities. However, not much public awareness has been undertaken to encourage the consumers in this regard.

Open access

The Commission issued the open access regulations in June 2005. The regulations detail out the method for determination of open access surcharge and the time frame for phasing of open access as given in Table 7.45.

Table 7.45. Phasing of open access

Phases	Customer category	Date of open access
I	Users requiring 10 MW or above at 132 kV	From 16 th June 2005
II	Users requiring 5 MW or above at 33 kV. or above and situated in industrial growth centers	From 16 th June 2005
III	Users requiring 2 MW or above at 33 KV. or above and situated in industrial growth centers	October 1 st , 2005
IV	Users requiring 5 MW and above and situated anywhere in state	From April 1 st , 2006
V	Users requiring 1 MW and above and situated in industrial growth center	From October 1 st , 2006
VI	Users requiring 2 MW and above and situated anywhere in state	From April 1 st , 2007
VII	Users requiring 1 MW and above and situated anywhere in state	From October 1 st , 2007

As per the regulations, the cross subsidy surcharge has been calculated based on the Draft National Tariff Policy¹. The sample calculation for FY 2005-06 shows that the cross subsidy surcharge for Open Access at 132 KV for other HT industrial consumer would be 94 paise/unit and at 33 kV would be 62 paise per unit. However, the actual surcharge would depend on case to case basis.

Availability of regulated entity related information

The following information circle and division wise for all entities regulated in Madhya Pradesh by the MPERC are available on the website of the MPERC for all stakeholders

1. Geographical Presentation of Transformer
2. Geographical Presentation of Distribution Losses
3. Geographical Presentation of Circle-wise % of Un-Metered consumers, status of employees & collection efficiency
4. Circle-wise Distribution Losses
5. Cumulative Division wise Losses
6. Annual Collection Efficiency
7. Compliance Report of Performance Standards
8. Transmission Performance Reports
9. Quarterly Performance Standards of Discoms
10. Circle-wise Performance Data of utility
11. Accelerated Power Development and Reforms Programme (APDRP)
12. Accelerated Power Development Reform Programme Status
13. Company wise - Work-wise Position of APDRP
14. Daily Transformer Failure Reports of Discoms
15. Break Down/Outage of Generating Units
16. Annual Details of DTR's Failure/Replacement
17. Un-metered Consumers

The above is extremely helpful for all stakeholders to understand the progress being made in power sector reform in the state. This step undertaken by the Commission is commendable. The Commission is also in the process of making a Regulatory Information Management Systems.

¹ The Draft National Tariff Policy states that cross-subsidy surcharge shall be computed as the difference between (i) the tariff applicable to the relevant category of consumers and (ii) the cost of the distribution licensee to supply electricity to the consumers of the applicable class. The draft policy states that in case of a consumer opting for open access, the distribution licensee would be in a position to discontinue purchase of power at the margin in the merit order. Accordingly, the cost of supply to consumer for his purpose may be computed as the aggregate of (a) the weighted average of power purchase costs (inclusive of fixed and variable charges) of top 5% power at margin in the merit order approved by the SERC adjusted for average loss compensation of the relevant voltage level and (b) the distribution charges determined on the principles as laid down for intra-state transmission charges.

Regulations notified by MPERC

The regulations notified by the MPERC are given in Table 7.46.

Table 7.46. Regulation notified by the MPERC

Regulation	Applicable Section	Gazette Notification Date
MPERC (Methods of Recruitment and Condition of service of Officers and employees Regulation'2001)	Sec - 84, 85,89 & 91	2 nd November 2001
MPERC (Recover of Expenses & other charges for providing electric line or plant used for the purpose of giving supply) Regulations, 2006	Sections 46 of the EA 2003 (no. 36 of 2003)	20 th November 2006
Electricity Supply Code 2004	Sec - 43, 47 (1) & (4), 50	16 th April 2004
Establishment of Forum and Electricity Ombudsman 2004	Sec - 42 (5), (6), (7)	30 th April 2004
MPERC (Establishment Of Forum And Electricity Ombudsman for Redressal of Grievances of the Consumers) Regulations, 2004 (2 nd Amendment).	sub-section (5), (6) & (7) of Section 42 read with clauses (r) & (s) of sub-section (2) of section 181	1 st September 2006
Procedure for application for License 2004	Sec - 15(1) (2)	4 th June 2004
Other Business of Transmission Licensee 2004	Sec - 41	11 th June 2004
Appointment of Consultants	Sec - 91(4)	2 nd July 2004
State Advisory Committee 2004	Sec - 87,88	2 nd July 2004
Distribution Performance Standards 2004	Sec - 57, 58, 59	16 th July 2004
Transmission Performance Standards 2004	Sec - 57,58, 59	23 rd July 2004
MPERC (Transmission Performance Standards) Regulations, 2004	-do-	17 th November 2005
Conduct of Business Regulation 2004	Sec - 92	30 th July 2004
Amendments in MPERC (Conduct of Business) Regulation, 2004	-do-	26 th July'2005
Condition of Transmission License 2004	Sec - 16	30 th July 2004
Amendments in "The Conditions of Transmission License for Transmission Licensee (including deemed Licensee)	-do-	26 th July 2005
Addendum to Conditions of Transmission License for Transmission Licensee (Including Deemed Licensee), 2005 (Second Amendment- of 2005)	-do-	28 th October 2005
Condition of Distribution License'04	Sec - 16	30 th July 2004
Procedure for Filing Appeal before Appellate Authority 2004	Sec - 127	17 th September 2004
Levy and collection of fee and charges by SLDC, 2004	Sec - 32	1 st October 2004
Security Deposit Regulation 2004	Sec - 47	1 st October 2004
Eligible Criteria and Grant of trading license, the duties & the terms and condition of trading license'04	Sec - 52	15 th October 2004
Power Purchase & Procurement Regulations, 2004	Sec - 86(1) (b) & (g)	26 th November 2004
MPERC (Power Purchase and Procurement Process) Reg.'04, Revision-1, 2006	-do-	10 th April 2006
Fees, Fines & charges Regulation	Sec - 86(1) (g) read with 181	14 th February 2005
MPERC (guidelines for Reporting of regulatory Compliance) Regulation'05	Sec - 86(i) (k) & 181(1)	13 th May 2005
MP Electricity Grid Code 2004 (MP Electricity Distribution code and Transmission Metering Code)	Sec - 86	20 th August 2004
MPERC (Manner of service and publication of notice) Regulation'04	Sec - 130	31 st December 2004
MPERC (Methods and Principles of Fixation of Charges and	Sec - 45(2) (3)	15 th April 2005

Regulation	Applicable Section	Gazette Notification Date
Schedule of Miscellaneous Charges Recoverable by Distribution License for supply of electricity) (In short Method and principles of Fixing Electricity Charges) regulation '2005		
MPERC (Terms & Conditions for Intra State Open Access in MP) Regulations 2005	Sec - 39(2) (d) 40 (c), 42 (2) (3) & 86 (1) (c)	24 th June 2005
MPERC (Power purchase and other matters with respect to conventional fuel based captive power plants) Regulation 2006	Sub-Sec (b) of Section 86	18 th September 2006
MIS Regulation 2004	Sec - 62 (2) & 181(2)	30 th April 2004
Details to be furnished by Generating Companies and Licensees for Determination of Tariff 2004	Sec - 62(2), 64(1)	13 th August 2004
MPERC (Methods & Principles for Fixation Of Charges Including Miscellaneous Charges Recoverable By Distribution Licensee For Supply Of Electricity) Reg.'06	Sec - 62(5)	25 th February 2006
Procedure for Calculating Expected Revenue from Tariff & Charges, Reg' 2005	Sec - 61, 62(5)	28 th September' 2005
MPERC (Terms and Conditions for Determination of Genco. Tariff) Regulations'2005	Sec - 61, 62(5)	5 th December 2005
MPERC (Terms and Conditions for Determination of Tariff for distribution and retail supply of electricity) Regulations'2005	Sec - 61, 62(5)	5 th December 2005
MPERC (Terms & Conditions for Determination of Tariff for distribution and retail supply of electricity and methods and principles for fixation of charges) Regulations, 2006	Sections 45 and 61 read with Section 181(2) (zd)	26 th October 2006
MPERC (Terms and Conditions for Determination of Transmission Tariff) Regulations'2005	Sec - 61, 62(5)	16 th December 2005
Madhya Pradesh Electricity Distribution Code'2005	Sec - 61, 62(5)	4 th January 2006

Power sector rating

As per the performance rating of the state power sector carried out at the instance of the Ministry of Power, GoI, Madhya Pradesh has been given the following ratings during FY 2003-04, FY 2004-05 and FY 2005-06.

Table 7.47. Power sector rating

	FY 2003-04	FY 2004-05	FY 2005-06
Rank	17	19	20
Score	24.75	24.75	21.97

The ranking of the state fell from 17 in FY 2003-04 to 20 in FY 2005-06. The report mentions the following as the strengths and weakness of the MP power sector.

Strengths

- Sound operating performance of generating plants in the state sector.
- Established regulatory process in the state – four tariff orders passed by the Madhya Pradesh Electricity Regulatory Commission

- Steps taken by the Regulatory Commission to increase the efficiency of the State utilities and reduce cross-subsidy levels
- Unbundling along functional lines; including separation of trading function completed

Weaknesses

- Defaults by MPSEB and its successor entities on state government and external loans
- Low levels of household electrification in the state at about 43 per cent
- Financial statements for 2004-05 not yet audited due to ongoing dispute with Chattisgarh State Electricity Board
- Revenue-cost coverage has declined to 80 per cent in 2004-05 from 83 per cent in 2003-04.
- High dependence on state government for subsidies; estimated to increase in future
- AT&C losses are very high at more than 50 per cent in 2004-05

Conclusion

- Reforms were initiated in the state of Madhya Pradesh in 1998 with the establishment of the Madhya Pradesh Electricity Regulatory Commission
- Generation, transmission and distribution functions have been unbundled
- Much of the progress has also been due to the reform programme funded by funding agencies like ADB and DFID
- The transmission system has been strengthened by ADB loan
- No significant improvement has been made in loss reduction. The actual losses were high at 43.08% in FY 2004-05. The targets, set by the Commission have not been achieved by the licensee
- The collection efficiency showed a downward trend till FY 2003-04, but is again showing an improvement. As per information available on the website of MPERC, the collection efficiency in FY 2005-06 was 88.95% and as for April-June 2006 was 93.47%
- The financial position of licensee has deteriorated in FY 2004-05 with revenue gap increasing to Rs 903 Crore.
- The Annual Accounts are not audited on time
- The status of metering at distribution transformer level is dismal with only 2% of them metered
- The state has high energy and peak shortages 13.5% and 18.50% respectively in FY 2004-05

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- The state's power sector is highly dependent on subsidy from the government
- The state depends highly on short term purchase of power through UI which is very expensive.

CHAPTER 8 Maharashtra

Introduction

Till June 2005, the erstwhile Maharashtra State Electricity Board (MSEB) was the largest SEB in the country supplying electricity to the entire state excluding Mumbai. In June 2005, Maharashtra State Government restructured MSEB into four companies. The companies formed after unbundling are:

- MSEB Holding Company Limited
- Maharashtra State Power Generation Company Limited (MSPGCL)
- Maharashtra State Electricity Transmission Company Limited (MSETCL)
- Maharashtra State Electricity Distribution Company Limited (MSEDCL)

The distribution function of MSEB has been transferred to Mahadiscom. The Mumbai area is served by three power utilities – Tata Power Company Limited (TPCL), Bombay Suburban Electric Supply (BSES)¹ and Brihan Mumbai Electric Supply & Transport (BEST). TPCL and BSES are private utilities while BEST is a municipal undertaking. Maharashtra also has a rural co-operative electricity distribution society - the Mula Pravara Electric Co-operative Society Ltd.

Maharashtra Electricity Regulatory Commission (hereinafter referred to as MERC or the Commission) was set up in August 1998 under the Regulatory Commissions Act, 1998.

Since its inception in 1999, MERC has issued three tariff orders for MSEB. It issued the first tariff order on May 5, 2000. This tariff order reviewed the ARR and tariff petition for FY 1999-2000 and FY 2000-01. The second tariff order was issued on January 10, 2002 (the year of review was FY 2001-02).

The third tariff order for MSEB was issued by MERC on December 1, 2003 for FY 2003-04². Thereafter there were no tariff orders for the subsequent years, i.e., FY 2004-05 and FY 2005-06. This delay in orders has been attributed to the process of unbundling (that took place in June 2005) and the subsequent transfer of assets.

In October 2006, MERC issued an order for MSEDCL for FY 2006-07. This order scrutinises the revenue and expenditure for

¹ BSES is now known as Reliance Energy Limited (REL)

² Though the final order for FY 2003-04 came out in March 2004, the operative part of the order was effective from December 1, 2003.

FY 2004-05 for MSEB and for MSEDCL for FY 2005-06¹, and determines tariffs for MSEDCL only for FY 2006-07.

For the purpose of our study, we have analysed the tariff orders for MSEB for FY 2003-04 and for MSEDCL for FY 2006-07. However, information from FY 2006-07 Order has been used selectively as the period of the study was FY 2003-04 to FY 2005-06. We have taken into account the cost estimates for FY 2004-05 and FY 2005-06, which have been analysed in brief by the Commission in the order. The Commission reviewed the costs for FY 2004-05 and FY 2005-06 and determined tariffs for FY 2006-07. In order to assess the tariff methodology and tariff innovations, we have looked at the tariff determination section in the FY 2006-07 order.

In our study, the actual figures have been taken from the Annual Accounts of MSEB for FY 2004-05 (in which figures for FY 2003-04 and FY 2004-05 are also available). The annual accounts of FY 2005-06 have not been published so far.

Demand supply gap

The demand supply gap in Maharashtra has grown rapidly in recent years. The gap has increased from 13.4% in FY 2002-03 to 18.1% in FY 2005-06. Peak deficit has increased from 19.8% in FY 2002-03 to 23.1% in FY 2005-06.

Movement in installed capacity

Besides its own generation capacity of 10189 MW (including capacity from captive sources), Maharashtra has a share of 2318 MW in Central Generating Stations (CGS) and 3649 MW from private generation plants. The movement in installed capacity by ownership from FY 2000-01 to FY 2005-06 is given in Table 8.1.

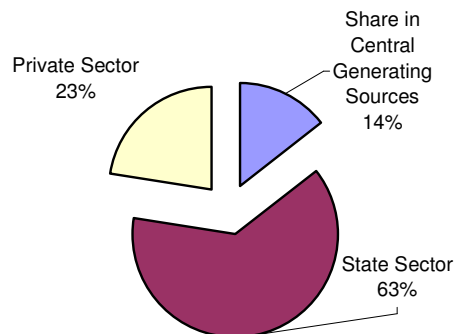
¹ In the tariff order for FY 2006-07, the MERC has stated that it has analysed the expenditure and revenue of MSEB for FY 2004-05 in accordance with the principles enunciated in the FY 2003-04 tariff order. It has considered the audited financial statements of MSEB for approving such expenses and revenues that do not have specific principles mentioned in FY 2003-04 Tariff order. Similarly, in FY 2005-06, MERC has determined the ARR for FY 2005-06 based on FY 2003-04 tariff order principles and the review of auditors (since the annual accounts of MSEDCL for FY 2005-06 are still to be published)

Table 8.1 Installed capacity by ownership (MW)

Particulars	FY 2000-01	FY 2001-02	FY 2002-03	FY2003-04	FY 2004-05	FY 2005-06
State sector	9690.19	9690.19	9770.57	9772.57	9812.57	10189.42
Share in Pench project in MP	53.38	53.38				
Private sector	3167.54	3330.76	3409.80	3409.80	3461.52	3648.92
Total state and private sector	12911.11	13074.33	13180.37	13182.37	13274.09	13838.34
Share in Central sector stations	2027.90	2027.90	2027.90	2027.90	2027.90	2318.39
Total Capacity available	14939.00	15102.00	15208.27	15210.27	15301.99	16156.72

SOURCE Indian Electricity Scenario, Power Sector Profiles, Maharashtra power sector profile, Ministry of Power, Government of India available at http://www.powermin.nic.in/JSP_SERVLETS/internal.jsp

There has been very little capacity addition in recent years in Maharashtra. The installed capacity of Mahagenco has increased at a CAGR of only 1% from FY 2000-01 to FY 2005-06. The share from central generating stations has increased at a CAGR of 2.7% and overall the total capacity available to MSEB has increased at a CAGR of 1.6 % from FY 2000-01 to FY 2005-06. The total capacity available to MSEB has grown by only 1217 MW during this period and Mahagenco's capacity has increased by only around 500 MW. Figure 8.1 gives the source wise break up of installed capacity in Maharashtra as in October 2006.

**Figure 8.1** Source wise break up of installed capacity (October 2006)

SOURCE Indian Electricity Scenario, Power Sector Profiles, Maharashtra Power sector profile, Ministry of Power, Government of India

Net Generation

Table 8.2 and Figure 8.2 give the net generation (net of auxiliary consumption) for MSEB/Mahagenco.

Table 8.2 Generation over the years

Net Generation of MSEB/Mahagenco	MU (net generation)
FY 2002-03	44710
FY 2003-04	46464
FY 2004-05	47245
FY 2005-06	46459

SOURCE Annual accounts for FY 2004-05 and tariff petition of MSEDCL for FY 2006-07
The net generation has increased from 44710 MU in FY 2002-03 to 46459 MU in FY 2005-06 at a CAGR of 1.3%. On the other hand, demand has increased at a CAGR of 5.65%. Figure 8.2 gives the graphical representation of the trend in net generation of MSEB/Mahagenco from FY 2002-03 to FY 2005-06.

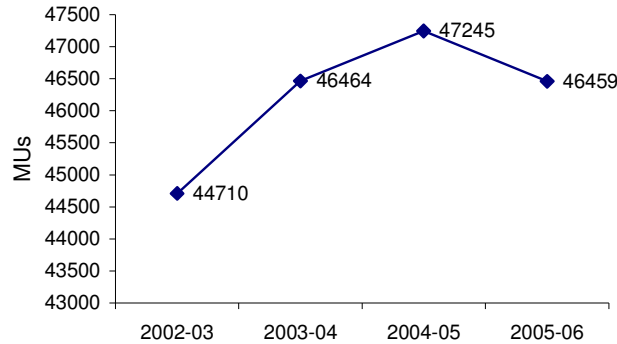


Figure 8.2 Movement in net Generation

SOURCE Annual accounts for FY 2004-05 and tariff petition of MSEDCL for FY 2006-07

The increased demand-supply gap has led to regular load shedding. It has also necessitated purchase of costly power. Table 8.3 gives the load shedding for FY 2004-05 and FY 2005-06.

Table 8.3 Peak Demand Vs Availability and load shedding

Particulars	FY 2004-05 (actuals)	FY 2005-06 (actuals)
Peak Demand	12749	14061
Availability (at the time of peak demand) (MW)	9704	9856
Load shedding (at the time of Peak demand) (MW)	3045	4205
Load shedding (at the time of peak demand) (MU)	38.85	66.5

SOURCE Tariff petition of MSEDCL for FY 2005-06

The Commission in an order issued in August 2005, had stipulated the load shedding protocol, wherein the divisions are categorised as urban and industrial agglomerations, agricultural dominated regions, and other regions, and classified as A, B, C and D group, depending on the distribution and collection loss in the division. This order was modified in January 2006 in view of the need for more load shedding. The hours of load shedding (as per the January 2005 order) are given below. The hours of load shedding has been stipulated with defined ceiling levels of load shedding for the demand supply gap level of 4500

MW. Table 8.4 gives the stipulated hours of load shedding for different categories of consumer.

Table 8.4 Stipulated hours of load shedding

Region	Urban & Industrial agglomerations	Other regions	Agriculture dominated region
Group	Hours	Hours	Hours
A	2.5	4.5	11
B	3	5	11.5
C	3.5	5.5	12
D	4	6	12

SOURCE Tariff order for MSEDCCL for FY 2006-07

The maximum stipulated load shedding is for D category agricultural dominated region, at 12 hours daily, while the least stipulated load shedding is for A category urban and industrial agglomerations at 2.5 hours.

Capacity Expansion plans

Though the state is reeling under major shortages, however, Mahagenco does not have much capacity coming up in the next five years. Around 2500 MW of additional capacity is expected to come up between 2006-10. Mahagenco is depending to a larger extent for around 3445 MW capacity on units of central generating stations planned to come up by 2010-11. Table 8.5 gives the planned capacity expansion in Phase -1 (firmed up plans coming up till 2009-10).

Table 8.5 Capacity addition plan "firmed projects"- phase -1

Existing Capacity	Year of Availability	Capacity in MW	Expected date of commercial operation
MSEB/ Mahagenco			
Utilisation of existing capacity of GTPS	2007-08	792	
Parli TPS Ext Stage-I	2006-07	250	July-06
Paras TPS Exp Stage -1	2006-07	250	November-06
New Parli TPS Exp-II	2008-09	250	October-08
Paras TPS Exp-11	2008-09	250	October-08
Kharperkheda Project	2008-09	500	March-09
Bhusawal TPS Exp Unit 1	2009-10	500	August-09
Bhusawal TPS Exp Unit 2	2009-10	500	November-09
Total MSEB/Mahagenco		2500	
IPP Projects			
RGPPL (DPC)	2006-07	2,210	
Inter-state Projects			
Sardar Sarovar Project	2004-05	392	
Irrigation Project Ghatghar PSS	2006-07	250	

SOURCE Information provided by MahaGenco

In phase –II, the state has outlined many more projects which are planned to become available from FY 2008-09 to FY 2010-11. However most of these projects are still to be firmed up.

Phase –II Projects (MAHAGENCO, IPPs and ultra mega projects)¹

Table 8.6 gives the projects planned under phase -II

Table 8.6 Proposed projects under Phase-II

Proposed projects of Mahagenco	Year of Availability	Capacity (MW)
Uran GTPS Exp	2008-09	1,040
Talegoan Gas project	2008-09	1,400
Chandrapur TPS	2009-10	500
Koardi TPS Exp	2009-10	1,000
Dhopawe Coastal Project	2010-2011	1,600
Total MahaGenco		5,540
IPPS		3,973
Ultra Mega Projects (4800 MW)		4,800
Total planned capacity		14,313

SOURCE Information provided by MahaGenco

In the short-run (atleast in the next five years) the proposed capacity addition of Mahagenco will not be able to meet the growing demand and the state would continue to depend on outside sources and may continue to face shortages.

FY 2002-03 in retrospect

In FY 2002-03, total revenue receipts were Rs 13447.09 Crore and the revenue expenditure was Rs 11045.36 Crore. After taking into account the adjustment related to previous year and the appropriation the net deficit was Rs 254.69 Crore².

Consumption and access

Sales/demand estimation

In FY 2003-04, MSEB had projected total sales of 40515 MU and the Commission allowed only 39707 MU based on its estimation (discussed in detailed subsequently in this section). The actuals were reported at 43575 MU and this shows that both the MSEB and the MERC were short on their estimation of total sales.

In FY 2006-07 Order, the Commission has approved sales for FY 2004-05 and FY 2005-06 based on audited figures.

¹ While the phase-I projects are firmed up, the second phase projects are ,subject to availability of fuel (as per the Mahagenco Website).

² As per information available in the MSEB annual accounts for FY 2004-05

Table 8.7 and Figure 8.3 give the proposed and approved sales for FY 2003-04, FY 2004-05 and FY 2005-06.

Table 8.7 Sales for FY 2003-04, FY 2004-05 and FY 2005-06

MU	FY2003-04	FY2004-05	FY2005-06
Proposed	40515	42948	45956
Approved	39709	46101	48904
Actual	43575	46101	48904

SOURCE Tariff order for MSEB FY 2003-04, tariff order for MSEDC for FY 2006-07

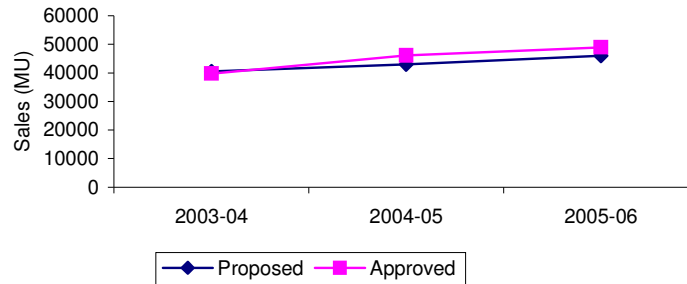


Figure 8.3 Proposed and approved sales for FY 2003-04 to FY 2005-06

SOURCE Tariff order for MSEB FY 2003-04, tariff order for MSEDC for FY 2006-07.

Sales projections for FY2003-04

In FY 2003-04, the sales to metered category of consumers were projected by applying 10 year CAGR over the base sales to the respective category in FY 2002-03, except in cases where no visible trend was noticed or where the sales projected by the Commission were almost the same as those projected by the MSEB. In such cases, the Commission accepted the sales projected by the MSEB. The sales to un-metered category of consumers were projected by multiplying the consumption norm with the projected connected load for that category in FY 2003-04.

Agricultural consumption (FY 2003-04)

A major portion of the consumption in this category is un-metered, and is charged on flat rate basis. The Commission applied the consumption norm of 1300 hours/HP/year to assess the consumption from the un-metered category. This particular consumption norm was arrived at after MSEB undertook an Energy Audit. MSEB projected a certain shift in connected load from the un-metered category to the metered category in FY 2003-04, and also projected the metered consumption on the basis of the existing metered consumption and the additional metered load.

On analysing the consumption projected by MSEB for metered LT agricultural consumers, the Commission found that MSEB had projected substantially higher consumption by the metered consumers, at around 990 hours/HP/year. The average consumption norm of metered agricultural consumers was around 500 hours/HP/year. The Commission considered consumption norm of 500 hours/HP/year to project consumption of metered agricultural consumers.

The flat rate tariffs for agriculture category have been determined such that they reflect the actual consumption pattern. The following two sub-categories within the un-metered category were created:

1. A sub-category comprising circles with a consumption norm lower than the average norm of 1300 hours/HP/year
2. Second sub-category comprising circles with a consumption norm higher than the average norm of 1300 hours/HP/year

Table 8.8 gives the MERC estimate on LT agriculture consumption for FY 2003-04.

Table 8.8 LT Agriculture Category: sub-category-wise consumption

Sub-Category	MERC Estimate
	FY 2003-04 MU
Flat Rate Tariff	6893
Circles with consumption norm < 1300 hours/HP/year	4480
Circles with consumption norm > 1300 hours/HP/year	2413
Metered Tariff	865
Total	7757

SOURCE Tariff order of MSEB for FY 2003-04.

The Commission's sales estimates for FY 2004-05 and FY 2005-06 are based on actuals.

Category wise sales

In the FY 2003-04-tariff order, sales were categorised into two major categories of consumers for MSEB: Low Tension (LT) and High Tension (HT) as described below.

LT Category

- Domestic
- Non-domestic
- LTP-G: (a) LT industrial and (b) power loom category
- Public Water Works (PWW): (a) Urban PWW and (b) Rural PWW
- Agriculture
- Street lighting

HT Category: HTP-I, HTP-II, HTP-III (PWW), HTP-IV (PWW), HTP-V (Railway Traction), HTP-VI, HTP-VII (Agriculture and related categories), Mula Pravara and Inter-State.

The category-wise sales were apportioned to different slabs on the same basis as the average monthly slab-wise sales over the past 4 years, viz. FY 1999-00 to FY 2002-03. The number of consumers in different slabs was projected in the same manner. In case of HT consumers, the sales in different time slots were apportioned to different ToD slots based on the actual ToD consumption pattern exhibited by these categories in FY 2002-03.

Table 8.9 gives the proposed and approved sales for FY 2003-04.

Table 8.9 Category wise movement in sales from FY 2000-01 to FY 2003-04

Category	Proposed	Approved	Diff b/w proposed and approved sales
LT Category			
Domestic (LT1)	7863	8781	11.67%
Non-domestic (LT2)	1763	1954	10.83%
LTP-G (including power loom)	3294	3640	10.50%
Public Water Works	481	481	0.00%
Agriculture	10145	7787	-23.24%
Street Lighting	567	635	11.99%
Sub Total LT	24113	23278	-3.46%
HTP-I	6644	6644	0.00%
HTP-II	6217	6217	0.00%
HTP-III	637	637	0.00%
HTP-IV	394	394	0.00%
HTP-V (Railway Traction)	980	980	0.00%
HT Category			
HTP-VI	310	310	0.00%
HTP-VII (Agriculture)	582	582	0.00%
Mula Pravara	638	667	4.55%
Sub Total HT	16402	16431	0.18%
Grand total (LT + HT)	40515	39709	-1.99%

SOURCE Tariff order for MSEB for FY 2003-04

There is a difference of only 2% between the proposed and approved sales for MSEB for FY 2003-04. In the LT category, MERC approved higher sales for the domestic and commercial category and lower for the agricultural category.

In the HT category, the Commission allowed the proposed estimates of MSEB barring sales to the Mula Pravara

Cooperative. For this category, the Commission allowed 4.5% higher sales than the amount proposed by MSEB.

Category wise sales in FY 2004-05 and FY 2005-06

The sales for FY 2004-05 and FY 2005-06 were approved by the Commission (in its order for FY 2006-07) based on the sales review done by the auditors for these years, i.e. the approved and actual figures are the same. In both cases the approved sales are more than the proposed sales. Table 8.10 gives the category-wise sales for FY 2004-05 and FY 2005-06.

Table 8.10 Category wise sales in FY 2004-05 and FY 2005-06 (proposed and approved/actual¹)

Consumer Category	FY 2004-05			FY 2005-06		
	Proposed (MU)	Approved (MU)	% difference b/w proposed and approved sales	Proposed (MU)	Approved (MU)	% difference b/w proposed and approved sales
Domestic	7,356	7,647	3.96%	7,828	8,029	2.57%
Commercial	1,922	1,966	2%	2,053	2,046	-0.34%
Industrial (Low & medium voltage)	3,792	3,792	0%	4,023	3,900	-3.06%
Industrial high voltage	15,453	16,042	4%	15,991	18,171	13.63%
Public lighting	539	540	0%	558	538	-3.58%
Railway traction	1,068	1,068	0%	1,146	1,096	-4.36%
Irrigation & agriculture	9,955	10,364	4%	11,353	10,785	-5.00%
Public water works	1,477	1,498	1%	1,567	1,486	-5.17%
Bulk supply to others*	1,361	3,157	132%	1,412	2,853	102.05%
Interstate	0	0				
Temporary connections	25	0		25	0	
Total	42,948	46,101	7%	45,956	48,904	6.41%

*Considering net power purchase from TPC

SOURCE Tariff order for MSEDCCL for FY 2006-07

Table 8.11 gives the share of the major consumer categories in the total sales.

Table 8.11 Share of the major categories in total sales

	FY 2003-04 (Actuals)	FY 2004-05 (actuals)	FY 2005-06 (actuals)
Domestic	17.52%	16.65%	16.42%
Commercial	4.12%	4.26%	4.18%
Industrial	39.62%	43.02%	45.13%
Irrigation and agriculture	23.30%	22.48%	22.05%
Total	100.00%	100.00%	100.00%

SOURCE TERI estimates based on actual sales category wise taken from Annual accounts of MSEB in FY 2004-05 and Tariff order for MSEDCCL for FY 2006-07

There has not been much change in the consumption pattern from FY 2003-04 to FY 2005-06 except in case of industrial consumption. Industrial consumption as a percentage of total

¹ The Commission approved the sales for FY 2004-05 based on actuals (information given in FY 2006-07 tariff order for MSEDCCL)

consumption has increased by around 5.5%. Both domestic and agricultural & irrigation consumption (as a percentage of total consumption) has declined marginally by around 1 % over these years. The share of Commercial category consumption as a percentage of total consumption has remained the same at around 4%.

Number of consumers and connected load

Table 8.12 summarises the number of consumers in each category for MSEB for FY 2003-04 and FY 2004-05 and FY 2005-06. The numbers for FY 2003-04 and FY 2004-05 are taken from the Annual Accounts of MSEB for FY 2004-05. The numbers for FY 2005-06 are taken from the Tariff Petition of MSEDCL for FY 2006-07.

As can be seen in the table, the total consumer base shows a decline from FY 2003-04 to FY 2005-06. The total consumer base as given in the Annual Accounts of MSEB does not match the figures given in the MSEDCL petition. The estimated number of consumers by MSEDCL is lesser than the number of consumers given in the Annual Account for MSEB.

This difference may partly be explained by the 'irrigation and water' category. In FY 2005-06, only metered agricultural consumers are given under 'the irrigation and water category'.

Table 8.12 Category wise number of consumers

Category	FY 2003-04 (Actuals)	FY 2004-05 (Actuals)	FY 2005-06 (Petition)
Domestic	9732362	9854816	9955348
Commercial	1116375	1102485	1033878
Public lighting	64683	66668	67179
Irrigation and watering	2274146	2297303	695639
Public water works	44098	44171	41208
Industrial (LT/HT)	299738	290262	295078
Railway Traction	476	472	
Bulk Supply	2	2	
Outside Supplies	4	4	
Misc (military)	514	-	9666
Total	13532398	13656183	12097996

SOURCE Figures for FY 2003-04 and FY 2004-05 are taken from Annual accounts of MSEB for FY 2004-05. Figures for FY 2005-06 are taken from the MSEDCL petition for FY 2006-07.

The domestic category has shown an increase of 2.3% from FY 2003-04 to FY 2005-06. The commercial category has shown a decline of 7.4% and the industrial consumers a decline of 1.5% from FY 2003-04 to FY 2005-06.

Table 8.13 gives the category wise connected load for MSEB in MW for FY 2003-04 and FY 2004-05.

Table 8.13 Category wise connected load (MW)

Category	FY 2003-04 (Actuals)	FY 2004-05 (Actuals)
Domestic	7970	8402
Commercial	1540	1658
Public lighting	333	333
Irrigation and watering	6999	7224
Public water works	420	523
Industrial (LT/HT)	8561	11283
Railway Traction	380	518
Bulk Supply	34	34
Misc (military)	203	
Total	26440	29974

SOURCE Annual accounts of MSEB for FY 2004-05

The total connected grew by 13% from 26440 MW in FY 2003-04 to 29974 MW in FY 2004-05

Table 8.14 gives the consumer mix and the connected load for the major consumer categories for MSEB for FY 2003-04 and FY 2004-05

Table 8.14 Consumer and connected load mix

	FY 2003-04		FY 2004-05	
	Consumer mix	Connected load	Consumer mix	Connected load
Domestic	71.9%	30.14%	72.16%	28.03%
Commercial	8.25%	5.82%	8.07%	5.53%
Industrial	2.21%	32.38%	2.13%	37.64%
Irrigation and watering	16.81%	26.47%	16.82%	24.1%

SOURCE Annual accounts of MSEB for FY 2004-05

Though domestic category constituted around 72% of the total consumer based in FY 2004-05, it constituted only 28% of the total connected load. Industrial consumers comprised only around 2% of the total consumer base in FY 2004-05. However they constituted for around 38% of the total connected load in the same year.

Table 8.15 gives the connected load per consumer across the major categories in FY 2003-04 and FY 2004-05.

Table 8.15 Connected load per consumer (kW)

	FY 2003-04 (Actuals)	FY 2004-05 (Actuals)
Domestic	0.82	0.85
Commercial	1.38	1.50
Industrial	28.56	38.87
Irrigation and watering	3.08	3.14
Total	1.95	2.19

SOURCE TERI estimates based on information from annual accounts of MSEB for FY 2003-04

The connected load per consumer for domestic category at 0.82 kW in FY 2003-04 and 0.85 kW in FY2004-05 is very low. This maybe the result of under-reporting of load by domestic consumers. The average connected load per consumer in the commercial category at 1.38 kW in FY2003-04 and 1.5 kW in FY 2004-05 is also low. The connected load in the industrial category has increased sharply from 28.56 kW in FY 2003-04 to 38.87 kW in FY 2004-05. The total connected load for this category has increased from 8561 kW in FY 2003-04 to 11283 kW in FY2004-05 which shows that the Commission may have taken measures to see that under-reporting of load is curbed. From the annual accounts for FY 2004-05, it is also noted that the number of consumers under the industrial category has declined marginally in FY 2004-05 from FY 2003-04. The connected load per consumer in the irrigation and watering category has increased from 1.95 kW to 2.19 kW.

Table 8.16 gives the category-wise consumption per consumer for the major categories.

Table 8.16 Category-wise average consumption per consumer in kWh (FY 2003-04, FY 2004-05 & FY 2005-06)

	FY 2003-04	FY 2004-05	FY 2005-06
Domestic	784.29	778.71	806.5
Commercial	1607.88	1783.24	1979
Industrial	57593.63	68331.37	74797.17
Irrigation and watering	4465.41	4511.38	-
Total	3320	3376	4042.32

SOURCE annual accounts for MSEB for FY 2004-05 (based on actuals), MSEDCL tariff order and tariff petition for FY 2006-07

The consumption per consumer for the domestic category has increased by only 2.8% from FY 2003-04 to FY 2005-06. The consumption per consumer for the commercial category and for industrial category has increased by 23 %and 30% respectively.

Figure 8.3 (A) gives the revenue realised from sales for MSEB in FY 2004-05. The highest revenue realization was from the industrial category at 48.4% of the total revenue followed by the

domestic category at 16.1%. In the 'others' category Bulk supply to Tata Power constituted around 7.5% of total revenue.

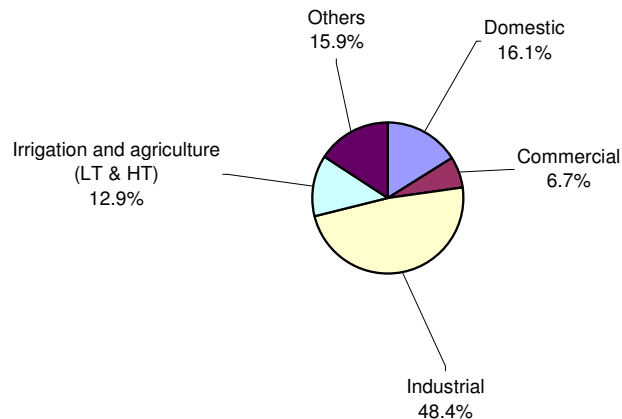


Fig 8.3 (A) Category-wise share in total revenue in FY 2004-05¹

SOURCE Annual accounts for MSEB for FY 2004-05

Table 8.17 gives the revenue realisation per unit of sale for the major categories in FY 2003-04 and FY 2004-05²

Table 8.17 Revenue Realization (Rs/kWh)

Category	FY 2003-04 (Actual)	FY 2004-05 (Actual)
Domestic	2.78	2.96
Commercial	4.92	4.26
Industrial low & medium voltage	3.49	3.43
Industrial high voltage	3.9	3.56
Irrigation and agriculture (HT and LT)	1.41	1.75
Public lighting	2.65	3.08
Total	3.07	3.09

SOURCE Annual accounts of MSEB for FY 2004-05

The highest realisation per unit of sales was from the commercial category at Rs 4.26 per unit in FY 2004-05. The lowest realization was from the irrigation and agriculture category at Rs 1.75 per unit in FY 2004-05

Status of Rural electrification

Under the Rajiv Gandhi Grameen Vidhyutikaran Yojana (RGGVY) launched by Ministry of Power in April 2005, an amount of Rs.84.70 Cr has been sanctioned to Maharashtra. The scheme covers 36 districts. Table 8.18 highlights the status

¹ Actual revenue realization category wise is not available for FY 2005-06.

² The total revenue for each category for FY 2005-06 is not available and hence the comparison is limited to two years.

of rural household electrification in Maharashtra. Around 65% of rural households have been electrified.

Table 8.18 Rural household electrification

Total number of rural Households	Households having Electricity	% Electrified Households	Unelectrified Households	% Unelectrified Households
10993623	7164057	65.17	3829566	34.83

SOURCE Website of Ministry of Power, www.powermin.nic.in

The total number of inhabited villages and towns electrified as on 31 March, 2005 was 35918.¹

Efficiency improvement

Transmission and distribution loss estimation

Table 8.19 gives the proposed, approved and actual T&D losses for MSEB. Since the Commission did not issue any tariff order for FY 2004-05 and FY 2005-06, there are no approved figures for these years.

Table 8.19 T&D losses (Proposed, approved & actual)

	FY 2003-04	FY 2004-05	FY 2005-06	FY 2006-07
Proposed	36.62%	35.1%	33.26%	31.37%
Approved	36.62%	-	-	38.12%
Actual	36.63%	34%	33.26%	NA

SOURCE Tariff order for MSEB for FY 2003-04, ARR and Tariff petition for MSEDCL for FY 2006-07 and Annual Accounts for MSEB for FY 2004-05. Figures for FY 2005-06 and FY 2006-07 are taken from the MSEDCL petition FY 2006-07 but are the aggregate losses for transmission and distribution.

It can be seen from the table that losses declined from 36.63% in FY 2003-04 to 33.26% in FY 2005-06. In FY 2006-07, the Commission approved T&D losses of 38.12%, although MSEDCL has proposed 31.37%. The Commission stated that since no review of T&D losses had been done in FY 2004-05 and FY 2005-06, an assessment could not be made on the reduction in losses. The Commission however was of the view that the losses, especially the distribution losses had been under projected in the previous years.

In FY 2003-04 (after analysing the month-wise Energy Accounting and the Merit Order Despatch) the Commission computed the energy input into the transmission and distribution network. The transmission loss in the system was assessed as the difference between the total energy input as recorded in the Merit Order Despatch data and the summation of the total energy input recorded by the different Divisions. The

¹ Information given in the petition of MSEDCL for FY 2006-07

aggregate transmission loss was then apportioned to the different zones/circles in proportion to their share of energy input. The distribution loss in each zone/circle was computed as the difference between the energy input and the energy billed for that zone/circle. The T&D loss of the zone/circle was computed as the difference between the total energy input into the circle after apportioning the transmission loss, and the energy billed, as a percentage of the total energy input in that zone/circle.

For assessing the zone-wise/circle-wise T&D losses, the circle classification as used in the T&D Loss (TDL) Order had been used to compare the improvements and deterioration across circles. The circles were classified in following groups:

Group I: Circles that reported T&D loss below 26.87% in the TDL Order.

Group II: Circles that reported T&D loss above 26.87% and below 39.49% in the TDL Order.

Group III: Circles that reported T&D loss above 39.49% in the TDL Order.

Table 8.20 gives the estimation of T&D losses for FY 2003-04 as projected by MSEB and as estimated by the Commission

Table 8.20 Energy Input Requirement in FY 2003-04

	MSEB (Projection)	Commission (Approved)
	MU	MU
Sales		
Metered	32112	32818
Unmetered	8403	6893
Total Sales	40515	39710
T&D Losses	23407	22942
Energy Input Requirement	63922	62652
T&D loss as a % of energy requirement	36.62%	36.62%

SOURCE Tariff order of MSEB for FY 2003-04.

Table 8.21 gives the T&D losses proposed and approved for FY 2006-07.

Table 8.21 :T&D losses for FY 2006-07 (Proposed and approved)

	Proposed (%)	Approved (%)
Transmission loss	6%	4.85%
Distribution loss	27%	34.97%
Total T&D losses	31.37	38.12%

SOURCE Tariff order for MSEDCL for FY 2006-07

MSEDCL in its petition for FY 2006-07 had considered transmission losses of 6%. MERC stated that as per Regulation 14 of the MERC (Transmission Open Access) Regulations, 2005,

the energy losses in the intra-state transmission system, as determined by SLDC and approved by the Commission are required to be borne by the Transmission System Users pro-rata to their usage of intra-state transmission system. The Commission thus approved 4.85% as intra-state transmission losses while estimating MSEDCL's energy input requirement for FY 2006-07.

The Commission had the view that in case of non-achievement of target intra-state transmission losses, distribution licensee should not be penalised. The Commission stated that it would true-up for the actual transmission loss levels at the end of the relevant tariff year to safeguard MSEDCL from non-achievement of target.

MSEDCL projected distribution losses for FY 2006-07 at 27%. While assuming 27% distribution losses, MSEDCL assumed that the consumption norm for agriculture in FY 2006-07 would be 2290 hrs/hp/annum¹. The Commission neither accepted the methodology nor the consumption norm proposed by MSEDCL. MERC reassessed the distribution losses based on the revised agricultural consumption norm of 1318 hrs/hp/annum² and sales to agricultural category at 9702 MU. MERC's revised estimates for distribution loss levels worked out to 34.97%. Table 8.22 gives the methodology for estimation of T&D Losses for FY 2006-07 in greater detail.

Table 8.22 Estimation of T&D losses for FY 2006-07

	FY 2006-07 (Proposed)	FY 2006-07 (Approved)
Power purchase	78453	77551
Transmission losses %	6%	4.85%
Transmission loss (MU)	4707	3761
Energy input	73746	73790
Sales		
Metered (excluding agriculture)	38285	38285
Agriculture metered	2619	2516
Agriculture unmetered	12349	7186
Credit billing (on a/c of TPS)	581	-
Total Sales	53835	47987
Distribution loss	19911	25802
Distribution loss %	27%	34.97%

¹ MSEDCL conducted an analysis of the sample energy audit data for FY 2003-04 and FY 2004-05 and arrived at the agricultural consumption of 1559 and 1602 hrs/hp/annum for FY 2003-04 and FY 2004-05 respectively. MSEDCL assumed that the consumption norm would increase from 1602 hours/hp/annum in FY 2004-05 to 1762 hrs/hp/annum and around 2290 hours/hp/annum in FY 2005-06 and FY 2006-07 respectively, using the 'best judgement' approach. The details on the assumptions for arriving at the norms for FY 2005-06 and FY 2006-07 are not given either in the petition or the tariff order.

² The Commission made its own assessment of the consumption norm for agriculture consumers. It based its sample on the recorded consumption of metered consumers for estimating agriculture consumption.

SOURCE MSEDCL Tariff order for FY 2006-07

The T&D losses approved by the Commission for FY 2006-07 at 38.12% are 3-4% more than the losses claimed by MSEDCL for earlier years (FY 2004-05 and FY 2005-06). The Commission was of the view that the loss levels have been under-projected by MSEDCL in the previous years in the absence of consumer metering information and the sample date being non-representative. As a result the Commission was also not able to assess whether MSEDCL had performed better or worse vis-à-vis the loss levels.

The Commission, however, was concerned about the distribution loss level of 32.97% for FY 2006-07. The Commission was of the view that significant proportion of the loss levels was due to commercial losses, including theft of electricity. The Commission asked MSEDCL to introduce staff incentives schemes, i.e. the staff should be made responsible for reduction of loss levels and an incentive scheme should be implemented by MSEDCL to target distribution loss reductions. The utility has taken steps to curb theft in order to control its distribution losses. These are discussed in greater detail in this chapter under the section "Governance".

Collection efficiency

Table 8.23 gives the collection efficiency of MSEB from FY 2001-02 to FY 2004-05.

Table 8.23 Collection efficiency

Year	Collection efficiency
FY 2001-02	89.27%
FY 2002-03	89.13%
FY 2003-04	90.03%
FY 2004-05	88.33%

SOURCE Information provided by Mahadiscom office, Mumbai

Collections have declined marginally from 90.03% in FY2003-04 to 88.33% in FY2004-05. Figure 8.4 represents graphically the trend in collection efficiency for MSEB from FY 2001-02 to FY 2004-05.

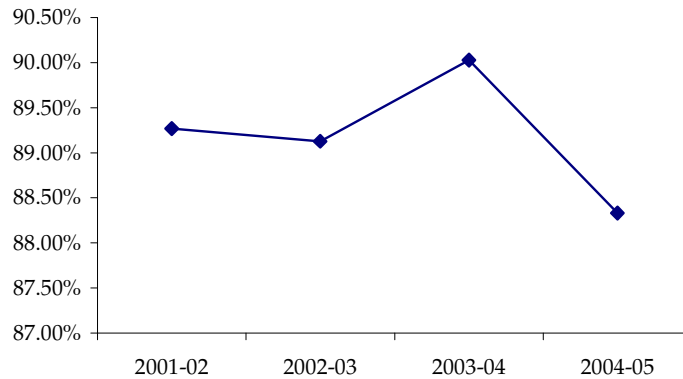


Figure 8.4 Collection efficiency

SOURCE Information provided by Mahadiscom office, Mumbai

AT&C losses

AT&C losses for MSEB for the years FY2001-02 to FY2004-05 are given below in Table 8.24 and Figure 8.5.

Table 8.24 AT&C losses from FY 2001-02 to FY 2004-05

	AT&C loss
FY 2001-02	46.34
FY 2002-03	44.3
FY 2003-04	44.18
FY 2004-05	26.62

SOURCE PFC estimates available at:

www.apdrp.com/apdrp/projects/pdf/AT&C_Loss_of_Power_Uilities.pdf

Table 8.24 shows that the AT&C losses declined very sharply in FY 2004-05. MSEB/MSEDCL has taken some measures to improve metering and curb theft. However such a sharp decline cannot be explained by such measures and the level of An AT&C loss for FY 2004-05 is suspect. MERC issued tariff order only in October for FY 2006-07, almost three years after its last order (for FY 2003-04 issued in December 2003), and therefore was no scrutiny done of the actual level of losses of MSEB/MSEDCL. Also, MERC itself pointed out in the tariff order for MSEDCL in FY FY2006-07 that the distribution losses had been under-projected in the years FY 2004-05 and FY 2005-06. MSEB/MSEDCL has stated its distribution losses for FY 2004-05 and FY 2005-06 as 31% and 29% respectively.

Figure 8.5 gives the graphical representation of AT&C losses from FY 2001-02 to FY 2004-05.

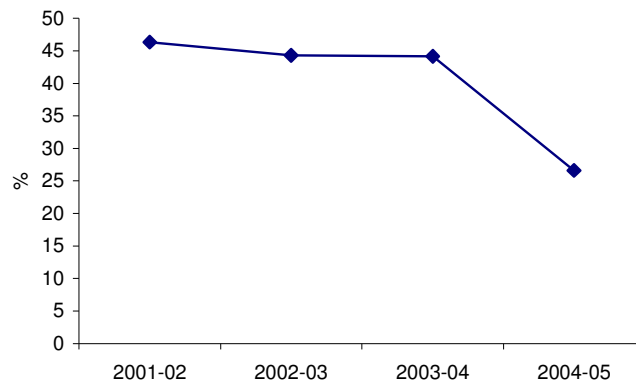


Figure 8.5 AT&C loss

SOURCE PFC estimates available at:

www.apdrp.com/apdrp/projects/pdf/AT&C_Loss_of_Power_Utillies.pdf

Metering

Table 8.25 gives status of metering in FY 2001-02, FY 2004-05 and FY 2005-06.

Table 8.25 Metering status

Particulars	FY 2001-02			FY 2004-05			FY 2005-06		
	Numbers	Metered	%age	Numbers	Metered	%age	Numbers	Metered	%age
11 kV Feeders	7558	7558	100	N.A	N.A	N.A	6148	6148	100
Distribution transformer	N.A	N.A	N.A	186000	50000	27	215241	52923	25
Consumer metering (in lakhs)	129	109	84	N.A	N.A	N.A	135.32	118.12	87

SOURCE Website of Ministry of Power, www.powermin.nic.in

At the consumer level, 87% metering has been attained in FY 2005-06. The 11 kV feeder metering is reported as 100%. Metering at the distribution transformer level is however low at 25%. In case of the flat rate category, all consumers have been metered apart from LT agriculture. As on November 2005, around 9.09 lakh agriculture consumers were metered and 16.65 lakh agricultural consumers remained unmetered. MSEDCL states that all new agriculture connections are released with meters.

Power purchase and own generation cost

MSEB has two sources of firm power: MSEB's own generating stations and purchase from Central Generating Stations. MSEB can buy some infirm power from Tata Power Company (TPC), Power Trading Corporation (PTC) and other sources such as non-conventional sources including co-generation, wind power and surplus power from captive plants. Table 8.26 and Figure

8.6 gives the quantum of generation from Mahagenco and from central generating stations and others.

Table 8.26 Total generation and power purchase (MU)

(MU)	FY2003-04 (Approved)	FY2004-05 (Approved)	FY 2005-06 (Approved)	FY2006-07 (Approved)
Mahagenco	46470	51334	46532	49575
CGS & others	16183	22595	25924	20214
Total	62653	73929	72456	69789 ¹

SOURCE Annual accounts for MSEB for FY 2004-05, Tariff order for MSEDCL for FY 2006-07, Tariff order for MSPGCL for FY 2006-07

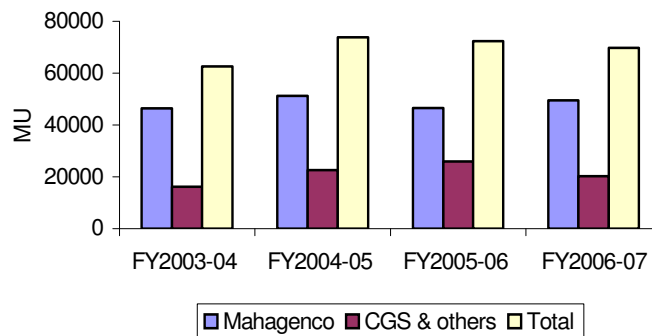


Figure 8.6 Total generation and power purchase (MU)

SOURCE Annual accounts for MSEB for FY 2004-05, tariff order for MSEDCL for FY 2006-07, tariff order for MSPGCL for FY 2006-07

The State's dependence on outside sources of power is increasing. Own generation (MSEB/Mahagenco) comprised around 74% of total power available to MSEB in FY 2003-04. This declined to around 71 % in FY 2006-07. Power from CGS and others has increased its share in the total mix from 25.8% in FY 2003-04 to 28.9% in FY 2006-07.

Cost of Own generation from FY 2003-04 to FY 2005-06

The quantum and the total cost of own generation for FY 2003-04, FY 2004-05 and FY 2005-06 is given in table 8.27. The per unit cost of generation is increased from Rs 0.88 in FY 2003-04 to Rs 1.05 per unit in FY 2005-06.

¹ The total for 2006-07 does not include the 5418 MU which is purchased at a high cost (of above Rs 4 per unit)

Table 8.27 Cost & quantum of own generation in FY 2003-04, FY 2004-05 & FY 2005-06

	FY 2003-04			FY 2004-05			FY 2005-06		
	Total own Generation (MU)	Generation cost (Rs.own Crore)	Per unit cost of Generation (Rs/unit)	Total own Generation (MU)	Total cost of generation (Rs. Crore)	Per unit cost of own generation (Rs/unit)	Total own Generation (MU)	Total cost of generation ¹ (Rs. Crore)	Per unit cost of own generation (Rs/unit)
Proposed	45983	4243	0.93	-NA	4889	NA	46459	4989	1.07
Approved	46470	4111	0.88	51334	4710	0.92	46532	4880	1.05
Actual	46463	4247	0.91	47245	4948	1.05	46459	4997	1.08

SOURCE Tariff order for MSEB for FY 2003-04, tariff order for MSEDCL for FY 2006-07 and tariff order for MSPGCL for FY 2006-07

Table 8.28 gives the station-wise proposed and approved quantum and cost of generation for FY 2003-04.

Table 8.28 Cost & quantum of own generation in FY 2003-04

	Quantum of net generation Proposed (MU)	Quantum of net generation Approved (MU)	Variable cost of Power proposed (Rs. Crore)	Variable cost of power approved (Rs. Crore)
Khaparkheda	4948	5471	508	505
Paras	316	345	38	42
Bhusawal	2899	2802	336	323
Nasik	5303	4680	694	663
Parli	3948	3538	514	454
Koradi	6020	3918	678	720
Chandrapur	14433	15693	1193	1136
Total Thermal	37868	38431	3960	3844
Gas Thermal	4039	3961	282	267
Hydel stations	4077	4079	-	-
Total MSEB	45983	46470	4243	4111

SOURCE Tariff order for MSEB for FY 2003-04

The Commission based its estimate on quantum of generation on the actual generation from April to July 2003 and the month wise generation based on merit order scheduling for months from August 2003 to March 2004. It arrived at a total quantum of 46470 MU. There is a difference of 487 MU between the net generation proposed and approved. Similarly, the Commission estimated the total generation cost for the period April 2003 to July 2003 based on actuals, subject to heat rate and transit loss norms. For generation from August 2003 to March 2004 it looked at the projected generation multiplied by the variable cost based on merit order. The station wise break-up of own generation cost and quantum has not been discussed by MERC for FY 2004-05 and FY 2005-06

¹ Proposed and approved fuel expense for FY 2005-06 (taken from the generation tariff order FY 2006-07).

Power purchase

Cost of power purchase in FY 2003-04, FY 2004-05 and FY 2004-05

In FY 2003-04, MSEB projected Rs 3494 Crore as the power purchase cost and the Commission approved Rs.3132 Crore. Per unit power purchase cost as per MSEB' estimate was Rs. 1.45 while the Commission approved Rs. 1.35.

Table 8.29 gives an overview of the power purchase sources, quantum and costs for FY2003-04.

Table 8.29 Power purchase for FY 2003-04

Particulars (For FY 2003-04)	Quantum	Quantum	Cost	Cost
	(Proposed)	(Approved)	(Proposed)	(Approved)
	MU	MU	Rs. Crore	Rs. Crore
NTPC				
Korba S.T.P.S	4494	4501	351	370
Vindhyachal II S.T.P.S	3046	2727	390	333
Vindhyachal I S.T.P.S	2373	2081	332	301
Gandhar G.P.S	936	818	316	315
Kawas G.P.S	714	457	313	229
Income tax payable	NA	NA	140	95
Sub-total (NTPC)	11563	10515	1842	1643
NPC				
Tarapur A.P.S	1231	1187	127	118
Kakrapar A.P.S	1703	1772	516	541
Sub-total (NPC)	2935	2959	643	659
Eastern region		108		19
Tata Power Company	658	104	165	26
Power Trading Corporation	2304	2127	527	466
Other sources (Non conventional etc)	480	300	152	95
Power Grid Transmission charges	NA	NA	165	180
UI charges	NA	NA	-	44
Total	17940	16183	3494	3132

SOURCE Tariff order of MSEB for FY 2003-04.

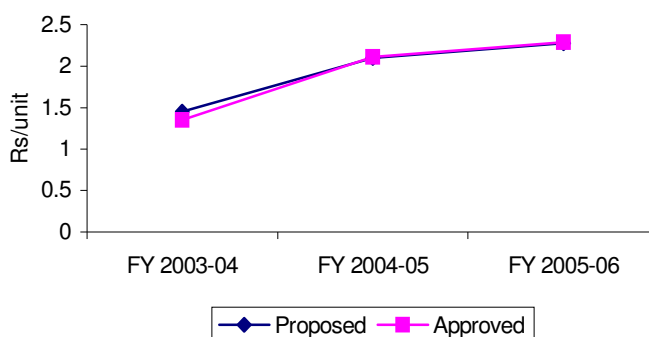
Since the Commission did not issue any tariff order for FY 2003-04 and FY 2004-05, the detailed plant-wise cost of power purchase is not available for these years. The total power purchase cost (proposed, approved and actual) for FY 2003-04, FY 2004-05 and FY 2005-06 is given in table 8.30.

Table 8.30 Cost of power purchase FY 2003-04, FY 2004-05 and FY 2005-06

	FY 2003-04			FY 2004-05			FY 2005-06 ¹	
	Petition	Approved	Actual	Petition	Approved	Actual	Petition	Approved
Power Purchase expenses								
Units purchased (MU)	17940	16183	22296	20023	22595	22595	23272	25924
Power purchase cost (Rs. Crore)	3494	3132	4469	4203	47774	4774.3	5324	5948
Average cost per unit (Rs/kwh)	1.45	1.35	2.00	2.1	2.11	2.13	2.28	2.29

SOURCE Tariff order of MSEB for FY 2003-04 and tariff order for MSEDCL for FY 2006-07.

Figure 8.7 gives the per unit cost of power purchase (proposed and approved) from FY 2003-04 to FY 2005-06. The per unit cost of power purchase has increased from Rs 1.35 (approved) in FY 2003-04 to Rs 2.29 in FY 2006-07

**Figure 8.7** Average per unit cost of power purchase

SOURCE Tariff order of MSEB for FY 2003-04 tariff order for MSEDCL for FY 2006-07

Trading and UI

Table 8.31 gives the quantum of energy trading proposed and approved for FY 2003-04.

Table 8.31 Energy trading for FY 2003-04

Particulars	Proposed (MU)	Approved (MU)
Mula Pravara	638	667
Inter state	0	0
Total energy trading	638	667

SOURCE Tariff order of MSEB for FY 2003-04.

Table 8.32 gives the quantum and cost of trading for FY 2004-05 and FY 2005-06. These costs were not scrutinized by the Commission and have been taken from the MSEDCL petition for FY 2006-07.

¹ The power purchase cost and quantum for FY 2005-06 is derived from the total power purchase cost of discom (given in the discom tariff order for FY 2006-07) minus the own generation cost and quantum given in the MSPGCL Tariff order for FY 2006-07

Table 8.32 Trading quantum and cost

	Quantum (MU)	Total Cost (Rs. Crore)	Average cost (Rs/unit)
FY 2004-05	2677	718	2.68
FY 2005-06	3904	1435	3.68

SOURCE MSEDCL ARR petition for FY 2006-07.

Unscheduled Interchange (UI)

In FY 2004-05 the net energy purchase, as per the petition, was 792 MU (which worked out to about 1.18% of total energy input). The total cost of UI energy received for FY 2004-05 was Rs 224 Crore and the average rate worked out to Rs 2.82 per unit.

In FY2005-06, the petitioner estimated the quantum of energy received based on the actuals for months from April to December 2005 (1187 MU) and for period January to March 2006, it assumed net receipt of 200 MU. The petitioner estimated UI charges considering the actual average rate for the period April to December 2005, which works out to Rs 3.02 per unit. Table 8.33 gives the UI charges for FY 2004-05 and FY 2005-06.

Table 8.33 UI charges

	Quantum (MU)	Total Cost (Rs Crore)	Average cost (Rs/unit)
FY2004-05 (actual)	792	224	2.82
FY2005-06 (estimated in petition)	1387	419	3.02

SOURCE MSEDCL tariff petition for FY 2006-07.

Employee cost

Table 8.34 gives the proposed, approved and actual figures for employee cost for FY 2003-04, FY 2004-05 and FY 2005-06

Table 8.34 Employee cost (Rs. Crore)

	FY 2003-04	FY 2004-05	FY 2005-06
Proposed	1695	1952	2094.28
Approved	1653	1963	2072.66
Actual ¹	1811	2133	NA

SOURCE tariff order and annual accounts for MSEDCL for FY 2003-04, tariff order for MSEDCL, MSPGCL and MSETCL for FY 2006-07

In FY 2003-04, MSEDCL projected employee expenses of Rs. 1695 Crore in FY 2003-04, net of capitalization, with a 5.2% increase

¹ The actuals for FY 2003-04 is not net of capitalisation as are the proposed and approved figures. This may explain the major difference between the proposed and actual employee cost (the annual accounts have clubbed the capitalization for employee cost and A&G expenses – Rs 186.92 Crore.

in most heads of employee expense over the previous year. The total employee expenditure allowed by the Commission was Rs. 1653 crore, net of capitalization, which was 97.64% of the proposed amount. The Commission mentioned that MSEB projected higher employee costs despite reducing trend.

In FY 2004-05, the Commission approved employee cost based on actuals as per the audited accounts. In FY 2005-06 the aggregate employee cost (for generation, transmission and distribution) was Rs 2094.28 Crore and the Commission allowed Rs 2072.66 Crore.

Employee productivity

Table 8.35 (A) and Figure 8.8 gives the employee productivity measured as employee cost per unit of sales and employee cost as a percentage of net ARR.

Table 8.35 (A) Employee productivity (employee cost as % of ARR and employee cost per unit of sales)

Particulars	FY 2003-04		FY 2004-05		FY 2005-06	
	MSEB projection	Commission's approval	MSEB projection	Commission's approval	MSEB projection	Commission's approval
Employee cost per unit of sales (Rs./ kWh)	0.43	0.42	0.45	0.43	0.46	0.42
Employee cost as a % of ARR (%)	12.67	12.37	13.49	13.93	12.39	12.72

SOURCE TERI estimates

The employee cost per unit of sales increased marginally from Rs 0.42 per unit in FY 2003-04 to Rs 0.43 per unit in FY 2004-05 and then came down to Rs 0.42 per unit in FY 2005-06. The employee cost as a percentage of ARR has increased from 12.37% in FY 2003-04 to 13.93% in FY 2004-05. It then declined to 12.7% in FY 2005-06. Figure 8.8 represents graphically the trend in employee cost per unit of sales and as a % of ARR for FY 2003-04, FY 2004-05 and FY 2005-06.

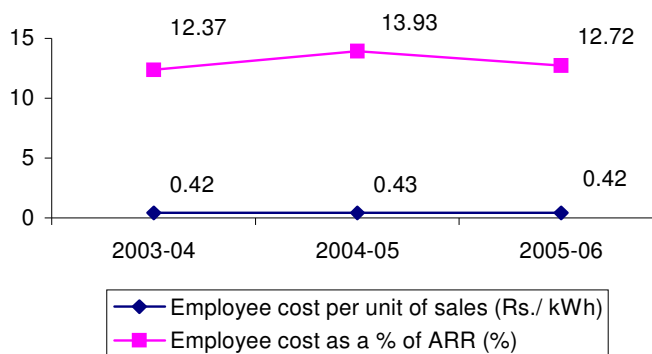


Figure 8.8 Employee productivity

SOURCE TERI estimates

Table 8.35 (B) looks at employee productivity in terms of revenue per employee and the number of employees per 1000 consumers. The number of employees per thousand consumers declined to 8.51 in FY 2004-05 from 8.62 in FY 2003-04. This reflects increased efficiency. The revenue per employee has also gone up by 6.7% in from FY 2003-04 to FY 2004-05.

Table 8.35 (B) Employee productivity

	FY 2003-04	FY 2004-05
No of employees per '000 consumers	8.62	8.51
Revenue per employee (Rs)	1,142,156	1,218,916

SOURCE TERI estimates (based on figures from the Annual Accounts of MSEB FY 2004-05)

Repair and maintenance expenses (R&M expenses)

In FY 2003-04, MSEB projected R & M expenses to the extent of Rs. 737.8 Crore (net of capitalization) which was around 3% of the Gross Fixed Assets (GFA) at the beginning of the year. The Commission agreed for R&M expenses of 3% of opening level of GFA. The R&M expenses have been capitalized at the average capitalization rate observed in the previous three years, which was slightly higher than the capitalization rate assumed by the MSEB. At the rate of 3% of opening level of GFA the Commission estimated R&M expenses of 737.11 Crore for FY 2003-04.

In FY 2004-05, the Commission allowed a higher R&M than the amount proposed by MSEB. While the MSEB had asked for 2.7% of GFA, the Commission allowed (as per prevailing norm) 3%. In FY 2005-06, MSEDCL estimated the R&M expenses as 3.15% of opening GFA for FY 2005-6, amounting to Rs 282

Crore. The Commission estimated that the actual¹ R&M expenses charged over the last five years as a percentage of opening level of GFA was 3.46%. It accordingly allowed R&M expenses of 3.46% of GFA, which worked out to Rs 305 Crore. In FY 2005-06, the aggregate R&M expense proposed by the unbundled utilities was Rs 871.86 Crore and the Commission allowed an aggregate expense of Rs 721.81 Crore. Table 8.36 gives the R&M expenses for FY 2003-04, FY 2004-05 and FY 2005-06 (aggregate for generation, transmission and distribution).

Table 8.36 R&M expenses in FY 2003-04, FY2004-05 and FY 2005-06

Particulars	FY 2003-04			FY 2004-05			FY 2005-06		
	Proposed	Tariff Order	Actual	MSEB	Tariff Order	Actual	MSEB	Tariff Order	Actual
Opening Balance of Gross Fixed Assets (Rs. Crore)	24827	24827	25918	25918	25918	26843	26724	26653	NA
R&M Expenses (Rs. Crore)	737.8	737.11	663	697	770	697	871.86	721.81	NA
R&M expenses as % of GFA	2.97%	3.00%	2.56%	2.70%	3.00%	2.60%	-	-	NA

SOURCE tariff order and annual accounts for MSEB for FY 2003-04, tariff order for MSEDCL, MSPGCL and MSETCL for FY 2006-07

Administration and General (A&G) expenses

Table 8.37 gives the A&G expense for FY 2003-04, FY 2004-05 and FY 2005-06

Table 8.37 A&G expenses* in FY 2003-04, FY 2004-05 and FY 2005-06 (proposed, approved and actual) (Rs Crore)

	FY2003-04	FY2004-05	FY2005-06
Proposed	145	185	193
Approved	139	148	152
Actual ²	187.6	202	NA

*Net after capitalization

SOURCE tariff order and annual accounts for MSEB for FY 2003-04, tariff order for MSEDCL, MSPGCL and MSETCL for FY 2006-07

MSEB projected A & G expenses of Rs. 145 Crore for FY 2003-04, whereas Commission approved only Rs. 138.58 Crore (95.57%). The MSEB had projected A&G expenses for FY 2003-04 based on a 4.2% increase over the actual expenditure in FY 2002-03. As A&G expenses can be controlled, Commission stated that it would not allow an increase over the actuals for

¹ The information is from the tariff order 2006-07, and the information pertain only to the discom. Further the actuals refer to the actuals claimed by MSEDCL in the petition. However the annual accounts of MSEDCL are not available for 2005-06.

² The difference between approved and actual can also be because while the proposed and approved A&G expenses are net of capitalization, the actuals do not take into account the capitalization. (In the annual accounts of MSEB, the capitalization for employee cost and A&G is clubbed together. (Aggregate capitalisation in 2003-04 of A%G and employee cost is Rs 161.9 Crore and in 2004-05 is Rs 186.9 Crore)

the previous but would allow a 4.2% increase over the approved A&G for the previous year.

For FY 2004-05, the Commission estimated A&G expenses considering a 4.2% increase (as in the previous order) on the approved value for FY 2003-04 and arrived at Rs 148 Crore net of capitalization. The actual A&G figures for FY 2004-05, at Rs 202 Crore, were higher but the Commission approved a lower amount in order to urge the Board to curb its expenses.

For FY 2005-06 the aggregate A&G (generation, transmission and distribution) expenses proposed was 192.6 Crore and the Commission allowed Rs 151.5 Crore.

The efficiency improvement in A&G as given in Table 8.38 and Figure 8.9 has been measured by looking at the A&G expenses per units of sales over the years and A&G expenses as % of ARR over the years (FY 2003-04 to FY 2005-06).

Table 8.38 Efficiency improvement in A&G expenses

Particulars	FY 2003-04		FY 2004-05		FY 2005-06	
	Proposed	Approved	Proposed	Approved	Proposed	Approved
A&G per unit of sales(Rs./ kWh)	0.041	0.039	0.047	0.032	0.04	0.030
A&G as a % of ARR (%)	1.21	1.16	1.28	1.05	1.14	0.93

SOURCE TERI estimates based on figures of A&G expenses from tariff order and annual accounts for MSEB for FY 2003-04, tariff order for MSEDC, MSPGCL and MSETCL for FY 2006-07

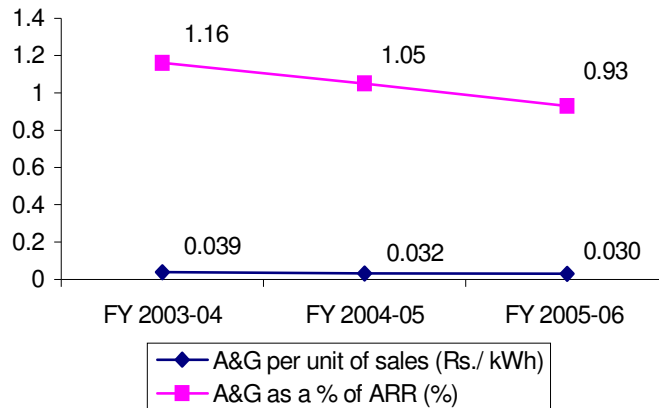


Figure 8.9 Efficiency improvement in A&G expenses

SOURCE TERI estimates based on figures of A&G expenses from tariff order and annual accounts for MSEB for FY 2003-04, Tariff order for MSEDC, MSPGCL and MSETCL for FY 2006-07

The A&G expenses per unit of sales declined from Rs 0.039 in FY 2003- 04 to Rs 0.03 in FY 2005-06. The A&G expenses as a

percentage of total ARR declined from 1.16% in FY 2003-04 to 0.931% in FY 2005-06.

Depreciation

Table 8.39 gives the proposed, approved and actual depreciation in FY 2003-04, FY 2004-05 and FY 2005-06

Table 8.39 Depreciation (Proposed, Approved and actual)

Depreciation (Rs. Crore)	FY 2003-04		FY 2004-05			FY 2005-06		
	Petition	Approved	Actual	Petition	Approved	Actual	Petition	Approved
Opening GFA			25918	25918	25918	26843	26724.37	26653.37
Depreciation expenses	1585	1578	1451.9	1434	1431	1431	1480.78	1572.09
Average depreciation rate (%)	NA	6.36%		5.53	5.52	-	-	-

SOURCE tariff order and annual accounts for MSEB for FY 2003-04, tariff order for MSEDCL, MSPGCL and MSETCL for FY 2006-07

In FY 2003-04, The MSEB projected depreciation expenses as Rs. 1585 Crore. The actual depreciation charged over the previous three years as a percentage of the opening gross block of assets worked out to 6.36% on an average, and the Commission applied this percentage to arrive at the allowable depreciation. The depreciation expenditure allowed by the Commission was Rs. 1578 crore.

The Commission's approved figures for depreciation for FY 2004-05 was based on actual depreciation charged to the profit and loss account as per the audited financial accounts. The Commission took the opening level of GFA as Rs 25918 crore and at a depreciation rate of 5.52% it arrived at a depreciation of Rs 1431 Crore.

In its petition for FY 2005-06, MSEDCL estimated the depreciation expenses at Rs. 541 Crore on the basis of the depreciation rates notified by the Ministry of Power (MoP) vide its circular dated March 29, 1994. The effective depreciation rate was 6.03% for MSEDCL. In line with the method adopted in FY2003-04, the Commission determined depreciation expenses based on "actual depreciation charged over the previous three years as a percentage of the opening gross block of assets". The Commission assessed the opening GFA on the basis of provisional transfer scheme at Rs 8894 Crore (GFA of Rs 8384 as per provisional transfer scheme on March 31, 2004 and net additions of Rs 510 Crore during FY 2004-05 as per the petition). It arrived at a rate of depreciation of 6.59% by looking at the actual depreciation charged over the past three years as a percentage of the opening gross block of assets. The Commission arrived at depreciation expense of Rs 586 Crore for FY2005-06. In Table 8.39, the aggregate depreciation of the generation, transmission and distribution business has been taken in order to compare with previous years figures for MSEB.

The proposed aggregate depreciation was Rs 1480.78 Crore while the Commission approved Rs 1572.09 Crore.

Capital expenditure

Table 8.40 gives the investment planned by the Mahadiscom from 2006-07 to 2008-09.

Table 8.40 Investment planned by Mahadiscom (MSEDCL) Rs Crore

Year	Capital works	R&M works	Total
FY 2006-07	774	1027	1801
FY 2007-08	4343	2000	6343
FY 2008-09	4343	2037	6380
Total	9460	5064	14524

SOURCE information provided by Mahadiscom

MSEDCL capital expenditure plan from FY 2006-07 to FY 2008-09 includes expenditure of Rs 9460 Crore in capital works and Rs 5064 Crore in R&M.

Sources of funds

Table 8.41 gives the status of APDRP as on March 31, 2006, for the entire state and MSEB in particular:

Table 8.41 APDRP status

Particulars	Project cost	Fund release	% of work completion	Utilisation	Utilisation during	Total utilisation upto
				upto 03/2005	2005-06	March, 2006
	Rs. Crore	Rs. Crore	%	Rs. Crore	Rs. Crore	Rs. Crore
Maharashtra	2231.58	349.01	40	325.52	565.80	891.32
MSEB	1376.21	-	38	168.35	347.83	516.18

SOURCE Website of Ministry of Power, www.powermin.nic.in

MSEB has utilised about Rs 516 Crore of funds under APDRP till March 2006.

Interest and finance charges

Table 8.42 gives the interest and finance charges for FY 2003-04, FY 2004-05 and FY 2005-06.

Table 8.42 Interest and finance charges (proposed, approved and actual) (Rs Crore)

	FY 2003-04			FY 2004-05			FY 2005-06 ¹		
	Proposed	Approved	Actual	Proposed	Approved	Actual	Proposed	Approved	Actual
Interest on long term loans	NA	1071	1293.35	878	529	1160.43	726	452.14	NA
Interest on working capital	NA	55	NA	NA	60	NA	310.08	121	NA
Other interest and finance charges	-*	-	NA	119	113	NA	213.42	145.42	NA
Total	1308	1126	1432.57	1305	702	1292.76	1249.5	718.56	NA

*interest on consumer's security deposit was considered in "other expenses" category in FY 2003-04

SOURCE tariff order and annual accounts for MSEB for FY 2003-04, tariff order for MSEDCL, MSPGCL and MSETCL for FY 2006-07

In FY 2003-04, MSEB projected net interest of Rs. 1308 crore including working capital expenses. The Commission approved only Rs. 1126 crore for FY 2003-04 (both figures net of capitalisation). This difference existed on account of following expenditures been disallowed by the Commission:

- On loans taken for investment in the Dabhol Power Corporation (DPC), as the investment was not a part of the regulated business of the MSEB.
- On loans taken to meet MSEB's revenue shortfall apart from the projected capital expenditure, as this method of computation resulted in increasing the revenue gap further.

The Commission considered interest on working capital as Rs 55 Crore at an interest rate of 10% on the total working capital of Rs 546 Crore.

In FY 2004-05, MSEB proposed interest on long-term loans net of capitalization at Rs 878 Crore. The Commission estimated the interest expenses based on the opening balance sheets available in the provisional transfer scheme and based on allowable borrowings and repayments. Since the Commission was not provided information on the interest rates for individual loans, the Commission applied the average interest rate submitted by MSEB on the average of the reworked opening and closing balance. It estimated the net interest on long-term loans as Rs 529 Crore.

The Commission calculated the interest on working capitals as Rs 60 Crore based on the principles followed in FY 2003-04 Tariff order and using the PLR of SBI existing at the time (10.25%) as the interest rate for working capital. The Commission considered interest on security deposit of Rs 55 Crore and the other finance charges at Rs 58 Crore and this aggregated to Rs 113 Crore.

¹ the interest and finance charges for FY 2005-06 are aggregate for generation, transmission and distribution.

In FY 2005-06, MSEDCL had proposed Rs 181 Crore as net interest (net of capitalization) on long term loans on the basis of its actual opening and closing balance of the capital liabilities. The Commission allowed net interest of Rs 99 Crore. The Commission did not consider the actual levels of opening and closing balance of capital liabilities and determined the interest expense based on the approved closing balances of FY 2004-05 and approved borrowings of FY 2005-06. Since there was no information available on interest rates for the approved individual loans, their drawl schedule and the corresponding interest rates, the Commission applied the average interest rate submitted by MSEDCL on the average of the reworked opening and closing balance.

The Commission estimated the interest on working capital as Rs 53 Crore based on the principles of followed in the MSEB tariff order FY 2003-04. The Commission considered interest rate of 10.25% to determine the interest on working capital (PLR of SBI). The proposed figures of MSEDCL for working capital are not available in the tariff order.

In FY 2005-06, other interest and finance charges, includes interest on security deposit and finance charges. The proposed amount under interest on security deposit was Rs 93 Crore. The Commission allowed Rs 65 Crore as interest on security deposit based on the principles followed in the FY 2003-04 Tariff order. The Commission worked out the other finance charges as Rs 34 Crore as against Rs 62 Crore estimated by MSEDCL.

In Table 8.42, for FY 2005-06, the aggregate interest and finance charges of the generation, transmission and distribution business has been considered. The aggregate interest and finance charge expenses proposed was Rs 1249.5 crore and the Commission allowed Rs 718.5 Crore.

Provision for bad and doubtful debt

Table 8.43 gives the provision for bad and doubtful debt for FY 2003-04, FY 2004-05 and FY 2005-06.

Table 8.43 Bad and doubtful debts (Proposed and Approved) (Rs Crore)

FY 2003-04		FY 2004-05		FY 2005-06	
Proposed	Approved	Proposed	Approved	Proposed	Approved
250	181	210	213	219	248

SOURCE Tariff order for FY 2003-04 and tariff order for MSEDCL for FY 2006-07

In FY 2003-04, the total receivables of the MSEB were Rs. 8765 Crore (31st March 2003), which is equivalent to almost 9 months of sales revenue in FY 2002-03. The Commission had set a target for MSEB of reducing the receivables to an equivalent of 5 months of the sales revenue in FY 2001-02. The Commission specified that the MSEB should reduce the

receivables every year in this fashion, and the permissible limit would be only 2 months of receivables. On the contrary, the receivables of the MSEB increased to almost 9 months of sales revenue.

MSEB projected the provision for doubtful debts at Rs. 250 Crore. The Commission allowed a provision equivalent to 1.5% of projected revenue in the year to the extent of Rs. 181 crore in FY 2003-04, considering the revenue from sale of electricity with existing tariffs being applicable for 8 months and revised tariffs being applicable for 4 months in FY 2003-04.

For FY2004-05 and FY2005-06, the Commission allowed 1.5% of revenue as provision for bad debt.

Rate of return

Table 8.44 gives the return on capital base for FY 2003-04, FY 2004-05 and FY 2005-06.

Table 8.44 Return on capital base- proposed, approved and actual (Rs. Crore)

	Proposed	Approved	Actual
FY 2003-04	433	433	658.3
FY 2004-05	461	390	300.4
FY 2005-06	667.28	523.24	-

SOURCE Tariff order and Annual Accounts for MSEB for FY 2003-04, Tariff order for MSEDCL, MSPGCL and MSETCL for FY 2006-07

In FY 2003-04, MERC allowed Rs 433 Crore as surplus was proposed by MSEB. This is based on a rate of 4.5% of NFA at the beginning of the year. The annual accounts for FY 2004-05, however state the actual return on capital employed in FY 2003-04 as Rs 658.3 Crore

In FY 2004-05, the Commission considered the audited financial statements as on 31 March 2004. It considered the opening NFA for MSEB of Rs 12274 Crore. It reduced the consumers' contribution of Rs 3617 Crore to arrive at a capital base of Rs 8657 Crore. At a rate of 4.5%, the Commission allowed a return of Rs 390 Crore in FY 2004-05.

In FY 2005-06, the Commission considered the opening Net Fixed Asset of MSEDCL on the basis of provisional transfer scheme at Rs 3513 Crore and considered a rate of return of 4.5%. Based on this, the Commission approved a return of Rs 158 Crore for FY 2005-06. In Table 8.44, for FY 2005-06, the aggregate return for the generation, transmission and distribution business has been considered. The proposed return for FY 2005-06 was Rs 667.28 Crore and the Commission allowed Rs 523.24 Crore.

Annual Revenue Requirement

Table 8.45 and Figure 8.10 summarise the net ARR for FY 2003-04 FY 2004-05 and FY 2005-06 (proposed, approved and actual) for MSEB.

Table 8. 45 Net ARR for FY 2003-04, FY 2004-05 & FY 2005-06

	FY2003-04	FY 2004-05	FY 2005-06
Proposed	13201	14474	16910
Approved	12309	14087	16297
Actual	14039	14992	NA

SOURCE Tariff order and annual accounts for MSEB for FY 2003-04, Tariff order for MSEDCL for FY 2006-07

For FY 2003-04, MSEB submitted an amount of Rs 13201 Crore as net ARR and the Commission approved Rs 12309 Crore. The actual ARR at Rs 14039 Crore was higher than proposed and approved ARR. In FY 2004-05, the MSEB had proposed Rs 14474 Crore and the Commission approved Rs 14087 Crore. The actuals for FY 2004-05 was Rs 14992 Crore. The net ARR (aggregate for generation, transmission and distribution) proposed for FY 2005-06 was Rs 16910 Crore and the Commission allowed Rs 16297 Crore.

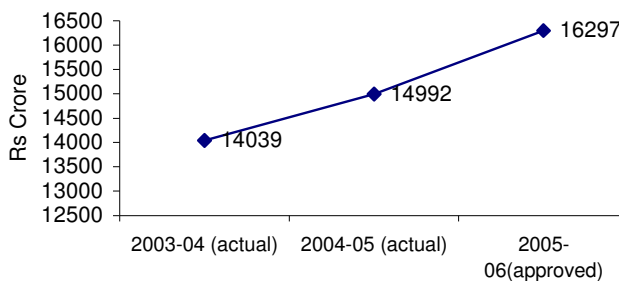


Figure 8.10 Net ARR of MSEB

SOURCE Tariff order for MSEB for FY 2003-04, Tariff order for MSEDCL for FY 2006-07 and Annual accounts of MSEB for FY 2004-05.

Table 8.46 gives the detailed component wise break up of ARR. The figures for FY 2005-06 are aggregate of generation, transmission and distribution in order to compare with previous year figures that are for MSEB.

Table 8.46 Component wise break of ARR for FY 2003-04, FY 2004-05 and FY 2005-06

	Rs Crore								
	FY 2003-04			FY 2004-05			FY 2005-06		
	Proposed	Approved	Actual	Proposed	Approved	Actual	Proposed	Approved	Actual
Generation Expenses	4243	4104	4247	4889	4710	4949	4989	4880	-
Power Purchase expense	3493	3132	4469	4203	4774	4774	5324	5948	-
Employee expenses	1695	1655	1812	1952	1963	2133	2094	2073	-
A&G expenses	145	139	188	185	148	202	193	152	-
R&M	738	737	663	697	770	697	872	721	-
Depreciation	1585	1578	1452	1429	1431	1431	1481	1572	-
Interest & other finance charges	1308	1126	1432.57	1305	703	1293	1250	718	-
Provision for bad debt	250	181	205.48	210	213	-	220	248	-
Other expenses	333*	291*	398.7*	130	24	347	850**	177**	-
Total expenditure	13790	12943	14500	14999	14737	15640	17273	16489	-
Reasonable return	433	433	658	461	390	300	667.24	523.24	-
Gross ARR	14223	13376	15158	15460	15127	15940	17932***	17005***	-
Less: non tariff income	1022	1067	1119	986	1039	949	1022	708	-
Net ARR	13201	12309 ¹	14039	14474	14087	14992	16910	16297	-

* Other expenses in FY 2003-04 include lease rental

** other expenses in FY 2005-06 is aggregate of contribution to contingency reserve, other expense, income tax and lease rental

*** The non-tariff income from the transmission business (Rs 7.6 Crore) has been subtracted from the Gross ARR SOURCE tariff order and annual accounts for MSEB for FY 2003-04, tariff order for MSEDCL, MSPGCL and MSETCL for FY 2006-07

Tariff/rate balancing

In this section, tariffs as determined in FY 2003-04 are discussed in details. In the subsequent years FY 2004-05 and FY 2005-06, there was no determination of tariffs and the tariffs determined in December 2003 carried on till the next review in October 2006 (tariff order for FY 2006-07). The tariff determination process in FY 2006-07 is discussed in this section in order to understand the changes that may have been brought about in the tariff determination process in recent years.

Approach to tariff determination

In FY 2003-04, the Commission adopted certain general principles, which were in continuation of the process of tariff rationalisation initiated in the previous tariff orders, and the provisions of ERC Act, 1998, and the EA 2003. In general, the movement of tariffs towards the average cost of supply was maintained such that inter-class cross-subsidy was reduced. There was also an attempt to ensure that even the intra-class

¹ Here the revenue through FOCA has not been deducted from Gross ARR. The Net ARR would be Rs 12174 if the FOCA amount of Rs 135 Crore is also deducted from Gross ARR

cross-subsidy was reduced. Some of the innovations and important aspects of the tariff determination process in FY 2003-04 and FY 2006-07 are discussed below:

- The rebates/incentives such as power factor incentive, bulk discount and prompt payment incentive were retained at their existing levels in both the tariff order of FY 2003-04 and FY 2006-07.
- In order to incentivize high consumption consumers who contribute a steady load to the MSEB system, a load factor incentive was introduced in FY 2003-04. Under this, consumers having load factor over 75% upto 85% were entitled to a rebate of 0.75% on the energy charges for every percentage point increase in load factor from 75% to 85%. Consumers having a load factor over 85% were entitled to rebate of 1% on the energy charges for every percentage point increase in load factor from 85%. The total rebate under this head was subject to a ceiling of 15% of the energy charges for that consumer. This incentive was limited to HTP-I and HTP-II categories only. This incentive was carried forward in tariff order for FY 2006-07 and the incentive was maintained at the same level.
- The Commission considered an average consumption norm of 1300 hours/HP/year in case of flat rate LT agricultural consumers in FY 2003-04. The attempt to determine the flat rate tariffs for agriculture category was done such that tariffs reflect the actual consumption pattern and that it also incentivises consumers to shift to metered consumption at a faster rate.
- The energy charge to be levied for net sale to the TPC was increased to match the higher cost of power purchase. The tariff applicable for sale to Mula Pravara Electric Co-operative Society (MPECS) was retained at its existing levels.
- In an attempt to increase the recovery from fixed charges (from 35% to 40%), the energy charges were adjusted in such a way that the average realisation from each consumer category approached the average cost of supply, while at the same time ensuring that no consumer category faces a tariff shock.
- Treatment of excess T&D loss: In the Tariff Order issued in January 2002, the Commission had initiated the process of levying the 'T&D loss Charge' for all consumers, in proportion to the average realization from that category. By introducing this charge, the Commission intended to create awareness among the consumers regarding the additional cost of the excess T&D losses. Moreover, the Commission had declared its intent to differentiate between the various circles/zones for the levy of the T & D loss charge, based on the T & D losses exhibited by the circle/zone in question.

- The Commission had initiated the process of levying a 'Reliability Charge', as a component of tariff for the subsidising categories – LT commercial, LTPG, HTP -, HTP II and Railways at 50 paise per unit. The intent of introduction of such charges as a component of tariff was to collect revenue from the consumers, who receive uninterrupted (reliable) power supply. This extra amount was to be used to fund the excess T&D losses and would be returned to these customer categories in future through reductions in tariffs, when the T&D losses reduced. The collection under the Reliability charge from December 2003 to March 2006 is given below in table 8.47.

Table 8.47 Collection of Regulatory Reliability charge

Year	RLC billed (Rs Crore)
FY 2003-04	313.1
FY 2004-05	1054.4
FY 2005-06	1163.8
Total	2531.3

SOURCE ARR and Tariff petition for FY 2006-07

So far nothing from this amount collected has been refunded to the consumers.

FY 2006-07

In the FY 2006-07 order the Commission adopted a methodology through which consumers or regions with lower loss levels and higher collection efficiency were given the benefit of additional power available from costly sources. While determining the average cost of supply and base tariffs, the Commission considered only the power purchase expenses of non-costly sources of power to be recovered from base tariffs, as the power purchase expense of costly power would be recovered through additional supply charge and not through base tariffs.

Tariff rationalization & innovations in tariff design

In the FY 2003-04 order, the MSEB did not propose any reduction/rationalization in the number of categories and slabs. The Commission however made a few changes that are given below:

- **Domestic Category:** The Commission reduced the number of slabs in this category, from four slabs to three slabs, by clubbing two consumption slabs, viz. 31-300 units and 101-300 units.
- **LTP-G Category:** This category had two sub-categories, viz., LT Industrial and Power Loom category. The Commission merged the power loom category with the LT industrial category. The Commission reduced the number of slabs within LTP-G category from three to two, by merging the last two slabs, viz. 1001-15000 units slab and the slab for over 15000 units.

For FY 2006-07, the Commission introduced some more changes in the tariff categories. Some of the important changes are discussed below:

- The Commission introduced two sub-categories in the existing LD-I (Domestic category) - the first comprising of BPL consumers comprising 30 units or less per month and the second sub-category consisting of consumers other than BPL.
- The Commission combined the HTP –I industries (BMR/PMR) and the HTP-II Industries (non BMR/PMR). These categories were earlier differentiated based on their geographical location. They have now been sub-classified based on the nature of industry - continuous and non-continuous industries.
- MERC revised the slabs for un-metered agricultural consumer category. The slabs have been classified based on the consumption norms set by the Commission. The slabs have been revised as Zones with the consumption norm more than 1318 Hours/HP/ Year and consumption norm less than 1318 Hours/HP/Year.

Category wise average tariff & cross -subsidy

The cost recovery (AR/AC) for the important consumer categories for FY 2003-04 and for FY 2006-07 is given in Table 8.48.

Table 8.48 Cost recovery (AR/AC)

	FY 2003-04			FY 2006-07		
	Average realisation ¹ (AR)	Average cost (AC)	AR/AC	Average realisation (AR)	Average cost (AC)	AR/AC
Domestic (LT 1)	2.79	3.07	91%	3.08	3.4	91%
Non Domestic (LT2)	4.41	3.07	144%	4.40	3.4	129%
Agriculture		3.07				
Agriculture LT	1.94	3.07	63%	1.76	3.4	52%
Agriculture HT	1.41	3.07	45%	1.44	3.4	42%
Industry		3.07				
HTP-I (HT industrial –BMR/PMR)	3.59	3.07	117%	3.17	3.4	93%
HTP-II (HT industrial –non BMR/PMR)	3.4	3.07	111%	2.92	3.4	86%
Total	3.08	3.07	100.3%	2.97	3.40	87.3%

Source: TERI estimates based on revenue and cost figures from tariff order of MSEB for FY 2003-04 and tariff order for MSEDCL for FY 2006-07

¹ The average realisation for FY 2003-04 is based on tariff approved in Tariff order 2003-04. The average realization is based on revenue that would be recovered in the four months that the tariffs approved in FY 2003-04 were to be applicable (ie from December 1, 2003 to March 31, 2004).

In FY 2003-04, the cost recovery was highest from the commercial category followed by the industrial categories. These categories were paying more than the average cost of supply. The cost recovery from domestic category was 91%. The recovery was least from the agricultural category at 63% for LT and 45% for HT.

In FY 2006-07 the recovery from the Commercial category continued to be the highest at around 130%. However recovery from industrial category was only 93% and 86% from the BMR/PMR and the non BMR/PMR categories respectively. The recovery from domestic category was 91%. Recovery from agricultural consumers was the lowest at 52% for LT and 42% for HT category.

Convergence Index (CI)

Figure 8.11 gives the moment of convergence index from FY 2003-04 to FY 2006-07¹. The CI for FY 2003-04 has been calculated at the existing tariffs from April 1 –November 31, 2003 and at revised tariffs for December 1 to March 31, 2004. This is because the revised tariffs for FY 2003-04 were applicable from 1st December 2003 and the Commission passed on the revenue gap (ARR-revenue from sales) onto tariffs only to the extent that could be recovered from tariffs applicable for four months (1st December 2003 to 31st March 2004). This is discussed in detail in the subsequent section of “Revenue Gap”.

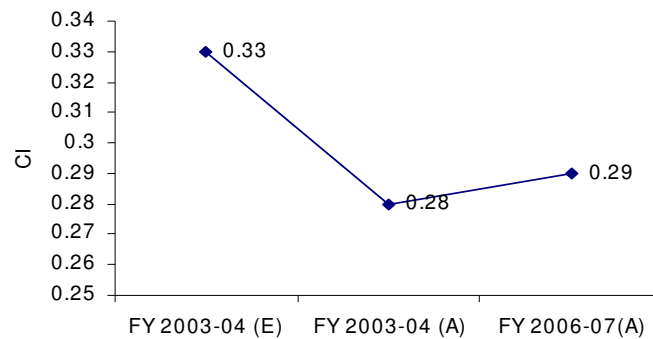


Figure 8.11: Convergence index

SOURCE TERI estimates based on revenue and cost figures from tariff order of MSEB for FY 2003-04 and tariff order for MSEDCL for FY 2006-07

The CI declined by 14% as a result of determination of tariffs in FY 2003-04. This shows that cross-subsidy reduced in FY 2003-

¹ No tariff order was issued for FY 2004-05 and FY 2005-06 and therefore CI for these two years cannot be calculated.

04. However, the CI increased marginally by 3.5% in FY 2006-07 showing that cross-subsidy has increased in FY 2006-07.

Subsidy support

In FY 2003-04, MSEB's tariff proposal did not assume any subsidy from the Government of Maharashtra (GoM). The Commission asked the GoM to indicate its subsidy commitment and the consumer categories that would benefit from it. GoM replied that it could give its commitment to give subsidy only after the Commission determined the tariff. The Commission did not consider any subsidy from the GoM.

There have been differences in the actual payment of subsidy between the Commission and the Maharashtra government. The GOM wanted to adjust the subsidy amount with the dues the MSEB had to pay to the state government. The Commission has ruled "as per the MERC (Terms and Conditions of Tariff) Regulations, 2005, the subsidy has to be paid in the form of a grant in advance. Hence the proposal for adjustment of MSEDCL dues to GOM with the subsidy payable by the GOM to MSEDCL cannot be accepted.¹

Table 8.49 gives the subsidy estimated, received and disbursed given in the ARR and tariff petition for MSEDCL for FY 2006-07.

Table 8.49 Subsidy estimated, received and disbursed (Rs. Crore)

	FY 2003-04			FY 2004-05			FY 2005-06		
	Estimated	Received	Disbursed	Estimated	Received	Disbursed	Estimated	Received	Disbursed
General concession in tariff to agricultural consumers	728.04	728.04	723.39	271.19	237.82	292.35	1012.55	1014.83	0
Additional 33.33% drought concession to agricultural consumers	177.35	177.35	196.8	8.15	0	0			
General concession in tariff to power loom consumers	160.44	160.44	158.12	258.69	313.22	196.12	236.33	236.33	0
Concession in FOCA (agriculture and power loom)	0	0	29.7	0	0	0			
Concession in tariff to metered powerloom consumers as par with concession available to unmetered powerloom consumers during the year 2001-02	35	35	177.69	0	0	0			
Free power for agricultural consumer	0	0	0	1036.27	1002.48	1002.48	314.88	311.32	310.86
Total	1100.83	1100.83	1285.7	1574.3	1553.52	1490.95	1563.76	1562.48	310.86

SOURCE ARR and Tariff petition for MSEDCL for FY 2006-07

Revenue gap

Table 8.50 gives the revenue gap estimated by the Commission from FY 2003-04 to FY 2006-07.

¹ As per order on "State Govt subsidy for providing free electricity supply to agriculture consumers, etc", case no. 28 of 2005.

Table 8.50 Revenue gap (Rs. Crore)

	Petition	Approved	Actual
Revenue Gap/(Surplus) for FY 2003-04		144	47.25
Revenue Gap/(Surplus) for FY 2004-05	513	(137)	519.44
Revenue Gap/(Surplus) for FY 2005-06	1401	(227)	
Revenue Gap/(Surplus) for FY 2006-07	3547	2516	
Aggregate Revenue Gap/(Surplus)	5462	2152	

SOURCE Tariff order for MSEB for FY 2003-04 and tariff order for MSEDCL for FY 2006-07

In FY 2003-04, the net ARR¹ approved by the Commission was Rs 12174 Crore. At the existing tariffs, the revenue worked out to Rs 12030 Crore and therefore, the revenue gap worked out to Rs 144 Crore. However, since the revised tariffs were applicable for only four months (From 1st December 2003 to 31st March 2004), the Commission did not allow the revised tariffs for four months to make up for the whole gap of Rs 144 Crore. While proportionally in the four months tariffs should have covered Rs 48 Crore, the Commission allowed recovery of Rs 62 Crore through tariffs.

In FY 2004-05, the net ARR approved stood at 14087 Crore while the revenue from sale of power (including additional FAC revenue) was Rs 14224 Crore. This resulted in a surplus of Rs 137 Crore according to the Commission. In FY 2005-06, the Commission arrived at a net ARR of Rs 16297 Crore and revenue from sale of power of Rs 16524 Crore. This resulted in a surplus of Rs 227 Crore.

The surplus from both the years was carried forward while determining the revenue gap for FY 2006-07. So while the revenue gap in FY 2006-07 was determined by the Commission at Rs 2516 Crore, it carried forward the surplus of FY 2004-05 and FY2005-06 over to FY2006-07 and finally arrived at a revenue gap of Rs 2152 Crore which was to be considered while determining tariffs for FY 2006-07.

Electricity Duty

Table 8.51 gives the amount collected as electricity duty for FY 2003-04 and FY 2004-05.

Table 8.51 Electricity duty recovered in recent years

Year	Electricity Duty (Rs Cr)	Actual
FY 2003-04		624.68
FY 2004-05		733.34

SOURCE Annual accounts for MSEB for FY 2004-05

¹ Net ARR is the Gross Annual Revenue requirement minus non-tariff income

Governance

Public participation

Tariff order for FY 2003-04

Public Notice was issued in newspapers for inviting suggestions and objections from interested parties. Copies of the MSEB's Petition and its summary were made available for inspection/purchase to members of the public throughout the State of Maharashtra in the MSEB's Executive Engineers' offices and on the MSEB's website. The last date for filing the written objections was 3rd September 2003, giving a period of one month from the date of issuing public notice. The consumers, by a Public Notice, were informed of the dates of the Public Hearings.

The Commission received a large number of written objections expressing concern about the proposed upward revision in the Tariff charges, the working of the MSEB and a host of other issues. In all, the Commission received a total of 792 objections.

Tariff Order FY 2006-07

Based on the instructions from the Commission, a Public Notice was issued in Newspapers on July 21, 2006, giving a period of one month to the public to file their objections. The Public Notice was published in all editions of the leading Newspapers in the

The consultants to the Commission prepared an Approach Paper on key issues for the purpose of public consultation before the hearings. The Commission received written objections expressing concern on high distribution losses, billing and metering complaints, non-availability of power in the rural areas, tariff increase proposed by MSEDCL, and a host of other issues. The Commission received objections/comments from a total of 13,432 objectors. Those objectors, who responded that they would like to be heard in person, were invited for the Public Hearing at locations notified by the Commission. Public hearings were held in five cities, namely, Amravati, Nagpur, Aurangabad, Nashik, Pune and Mumbai.

Timeliness of tariff orders

The Commission had indicated to the MSEB that it should file the Tariff Petition for FY 2003-04, by December 2002. However, the MSEB filed only the ARR Petition in April 2003. The Commission asked for some additional information and the petition was finally accepted in July 2003. The Commission issued the Tariff order for FY 2003-04 in March 2004. The operative part of this order was however effective from 1st December 2003 (i.e. tariffs were determined w.e.f 1st December 2003)

However, no tariff order came out subsequently in FY 2004-05 and FY2005-06. Finally in October 2006, the tariff order for MSEDCL was issued which determined tariffs for FY 2006-07 and scrutinized the Annual Revenue Requirement for FY 2004-05 and FY 2005-06.

The petitioners were asked to file their ARR and tariff petition for FY2006-07 by 31st December 2005. MSEDCL filed the petition for approval of ARR for FY 2004-05, FY 2005-06 and FY 2006-07 on 28th February 2006 before the commission. In the petition, MSEDCL did not submit tariff proposal as required by MERC (Terms and Conditions of Tariff) Regulation, August 2005. After a preliminary review, the Commission directed MSEDCL to submit the tariff petition as well. MSEDCL submitted the tariff proposal for FY 2006-07 on 26th May 2006. The tariff order for FY 2006-07 was issued on 20th October 2006. Table 8.52 gives the sequence of events for the tariff orders of FY 2003-04 and FY 2006-07

Table 8.52 Sequence of events

Event	Order for FY 2003-04	Order for FY 2006-07
Due date of submission of order	December 2002	December 31, 2005
Submission of petition	April 7, 2003	February 28, 2006
Submitting of revised Petition	July 23, 2003	May 26, 2006
Order issued	March 10, 2004	October 20, 2006
Gap b/w submission of revised petition and issue of order	229 days	147 days

SOURCE Tariff order of MSEB for FY 2003-04.

Consumer advocacy and redressal mechanism

In December 2003, MERC issued the MERC (Consumer Grievance Redressal Forum & Ombudsman) Regulations, 2003. These Regulations envisaged a three-tier system for grievance redressal: the first, an internal mechanism; the second consisted of Consumer Grievance Redressal Forums, which were to be established by the licensees, with two of its three members being independent outsiders; the third was appointment of Ombudsman by the Commission.

Under the regulations, the licensees are required to systematise and publicise their internal redressal systems (the first tier), and seek comments from the public with a view to improvement. The Regulations provide that there must be at least one Forum for each area equivalent to the Maharashtra State Electricity Board (MSEB)'s distribution Zones. Apart from necessary directions for redressal of the grievance, the Forum was empowered to direct compensation. The Ombudsman (to whom consumers can appeal against orders of the Forum) was to

consist of one or more persons to be appointed by the Commission.

Subsequent to this, In December 2004, the Commission appointed a retired Secretary to the Government of Maharashtra, as Electricity Ombudsman for the State, with headquarters at Mumbai. The Ombudsman has passed order in over 70 cases since its establishment.

Action taken by MSEB

The MSEB, under the MERC (Consumer Grievance Redressal Forum & Ombudsman) Regulations, 2003, instituted an Internal System for recording and redressal of consumer grievances at O&M's circle level.

The internal grievances redressal committee at Circle Head Quarter (HQ) consists of Executive Engineer (Office) in O&M Circle Office, Accounts Officer/Divisional Accountant and Senior Clerk (GAD), appointed by Superintending Engineer (O&M) and they function at the H.Q. of Circle Office. The grievances are listed at Circle Office and acknowledgement is forwarded to the concerned consumer within seven days. The Executive Engineer (O) at the O&M Circle office replies all applications received by internal redressal unit at O&M Circle level, within two months from the date of receipt.

Anti-theft

As per information available on MSEDCL's website and the MSEDCL tariff petition for FY 2006-07, the utility has taken a number of measures to curb theft. These are listed below:

- Special drives are arranged in theft prone areas.
- The flying squad personnel are specially trained for carrying out these special drives. At present 36 flying squad units are working under the control of V&S Directorate.
- Special squads have been formed recently in 2006 at the Circle & Division level to check theft amongst industrial and commercial consumers. The aim is to have a dedicated team to check theft amongst high energy consuming units. These special squads report directly to the Executive Engineer (O&M). The special squad is also provided with arm guards.
- An incentive scheme has been announced to encourage the general public and the staff of the utility to come up with information on theft and other such irregularity causing loss of revenue to the utility. Such persons are given cash

Award, not exceeding 5% of the amount of the final assessed bill.

Table 8.53 gives the number of theft cases detected and the recovery made by MSEB/MSEDCL

Table 8.53 Cases of anti theft and recovery (January 2005 to December 2005)

No of theft cases detected	Amount assessed (due to theft) (Rs crore)	Theft amount recovered (Rs. Crore)
2176	11.43	8.32

SOURCE Tariff petition for MSEDCL for FY 2006-07

MSEDCL also stated in its tariff petition for FT 2006-07, that it disconnected all consumers found indulging in theft.

Open access

MERC issued regulations for open access in June 2004. As per the regulations open access is to be provided to applicants as per the schedule given in Table 8.54.

Table 8.54 Open access schedule

Contract Demand of Consumer	Date on which open access will be allowed
Not less than 5 MVA	April 1, 2005
Not less than 2 MVA but less than 5 MVA	April 1, 2006
Not less than 1 MVA	April 1, 2007

SOURCE Maharashtra electricity regulatory commission (distribution open access) Regulation issued by MERC in June 2004.

Cross-subsidy surcharge in open access

MERC stated that the state should follow the formula prescribed by the government of India under the National Tariff Policy. The Commission ruled that cross-subsidy surcharge should not be linked to tariffs and calculation of cross-subsidy surcharge should not be undertaken every year. MERC ruled that cross-subsidy surcharge should be calculated for the base years and this surcharge should be reduced progressively and, as far as possible, at a linear rate to a maximum of 20% of the opening level by 2010-11. The methodology for calculation of cross-subsidy surcharge as per MERC is given below:

Box 1: Formula to be adopted for computation of Cross-subsidy surcharge

$$S = T \pm [C (1 + L / 100) + D]$$

Where,

S is the surcharge

T is the Tariff payable by the relevant category of consumers;

C is the weighted average cost of power purchase of top 5% at the margin excluding renewable power and purchase under UI

D is the Wheeling charge

L is the system loss for the applicable voltage level, expressed as a percentage

L should be inclusive of transmission loss. For intra-State transactions, transmission loss prescribed by the Commission for the STU should be considered, while for inter-State transactions, additional loss compensation as provided by CERC in its Open Access Regulations should be considered

Salient features

1. All OA transactions will have to pay the above cross-subsidy surcharge, except in the following cases:
 - For the quantum of power which is not being supplied by the Utility as per the Orders issued by the Commission from time to time. Currently, load restriction of 10% and 20% is applicable to continuous and non-continuous industry. Therefore, consumers in these categories will be permitted to purchase this quantum of energy without payment of cross-subsidy surcharge.
 - Open access consumer's purchasing power from renewable sources of energy.
 - Open access transactions as on the date of effectiveness of the EA 2003
2. Cross-subsidy surcharge should be calculated for the base year of FY 2006-07 and this surcharge should be reduced to 20% of the opening level of cross-subsidy surcharge by 2010-11.
3. New consumers will not be exempted from levy of cross-subsidy surcharge
4. Open access transactions undertaken using liquid fuel based thermal generation will also have to abide by these charges

SOURCE MERC order on "Methodology for computation of cross subsidy surcharge for open access transactions" dated September 2006.

In the tariff order for FY 2006-07, the Commission ruled that the cross-subsidy surcharge would be zero as per the above stated methodology. The Commission stated that the cross-subsidy surcharge worked out to zero, primarily because the weighted average cost of power purchase of top 5% at the margin works out to Rs 4.81 per kWh, after adding the effective intra-state transmission tariff. When grossed up for applicable voltage-wise losses, the power purchase cost further increases. The average realisation of HT categories are lower than the weighted average cost of power purchase cost to top 5% at the margin, (the cross-subsidy surcharge would be negative) and hence the Commission ruled that the cross-subsidy surcharge would be zero.

Appeals against orders

A number of orders of the MERC have been appealed against in the state High Court and in the Appellate Tribunal.

Some of these cases that were appealed against before the High Court are:

- Tata Power –BSES dispute on standby charges
- MERC's jurisdiction in the MSEB-Dabhol power dispute on alleged violation of the PPA between the two parties. This

case was argued before MERC, High Court and Supreme Court.

Some of orders of MERC appealed before the appellate tribunal are:

- Reliance Energy appealed against the MERC order dated July 2003. Reliance Energy appealed that Tata Power was a bulk supply licensee and therefore it could not sell directly to retail costumers. The Appellate Tribunal set aside the MERC order and agreed with REL that Tata Power could not sell to retail costumers.
- MSEDCL appealed against MERC order dated 18th October 2005 in which MSEDCL was asked to refund Rs 227.9 lakh to Llyod Steels
- The Municipal Corporation of Greater Mumbai challenged the tariff order issued by MERC for BEST-dated 9th March 2006. The matter was to do with the electricity distribution business of BEST subsidising its transport business.

Staffing

MERC has a Chairman, two Members and a Secretary. It also has a Director (technical) and one under-secretary. The total staff strength, excluding the above-mentioned officials, is 20.

Directives issued by MERC and their implementation

In the FY 2003-04 order, the Commission stated that MSEB had submitted a compliance statement with respect to directives issued in earlier tariff order and directives issued from time to time.

However, the Commission was of the view that the performance of the MSEB has been very poor. It pointed out a few instances on poor compliance. These are given below:

- MSEB was directed to disconnect supply to consumers who had arrears amounting to over 75 days of average billing and in the Commission's view "MSEB had not implemented this directive in the true spirit".
- Commission had directed MSEB to implement DSM and it was of the opinion that MSEB had only involved MEDA to conduct studies on DSM but had not come up with concrete schemes for implementing DSM
- MSEB had been directed to discontinue average billing but MSEB continued to issue bills based on average consumption.

The Commission stated that due to this poor compliance all the directives issued by the Commission in the previous Tariff

Orders issued in May 2000 and January 2002 were still applicable, and the MSEB has to comply with the same.

In the tariff order for MSEDCL for FY 2006-07, the Commission did not discuss the compliance of directives in previous years (FY 2003-04, FY 2004-05 and FY 2005-06). It issued fresh directives for FY 2006-07.

MSEDCL in its petition for FY 2006-07 gave a detailed account of its compliance of directives issued in FY 2003-04 and in earlier orders. Some of the important directives and their status of compliance (as per MSEDCL petition) are given in Table 8.55.

Table 8.55 Directives issued and their compliance

Directives issued in tariff order FY 2003-04 and from time to time	Status on compliance (as submitted by MSEDCL to MERC in tariff petition for FY 2006-07)												
To install meters for all the flat rate categories, viz. LT and HT agriculture, Power loom and Municipal Councils.	All flat rate category consumers are metered except LT-Agriculture. As on November 2005 9.09 Lakh Agricultural consumers were metered. All new Agriculture connections are released with meter												
To reduce T & D losses to 26.87% -	MSEB stated that it has undertaken efforts to reduce T&D losses through its time bound Internal Reforms Program. The T&D loss level for the last 4 year are as follows: <table border="1"> <thead> <tr> <th>Year</th> <th>T&D losses</th> </tr> </thead> <tbody> <tr> <td>FY 2001-02</td> <td>39.17%</td> </tr> <tr> <td>FY 2002-03</td> <td>38.59%</td> </tr> <tr> <td>FY 2003-04</td> <td>38.2%</td> </tr> <tr> <td>FY 2004-05</td> <td>35.28%</td> </tr> <tr> <td>FY 2005-06 (April to October 2005)</td> <td>32.97%</td> </tr> </tbody> </table>	Year	T&D losses	FY 2001-02	39.17%	FY 2002-03	38.59%	FY 2003-04	38.2%	FY 2004-05	35.28%	FY 2005-06 (April to October 2005)	32.97%
Year	T&D losses												
FY 2001-02	39.17%												
FY 2002-03	38.59%												
FY 2003-04	38.2%												
FY 2004-05	35.28%												
FY 2005-06 (April to October 2005)	32.97%												
To Implement DSM Schemes	There are some measures taken by MSEDCL(erstwhile MSEB) for the Load management such as 1) Single phasing Scheme 2) Gaothan feeder separation scheme 3) High Voltage Distribution System 4) Reactive Power Management(LTLMS) 5) Energy Lighting Programme 6) Gram Urja Bachat Yojana 7) Energy Audit & Water management of lift Irrigation 8) Akshay Prakash Yojana.												
To levy Reliability Charges for HT industry	MSEB has submitted the mechanism for levy of reliability charges to MERC .												
To start maintaining Voltage-level wise asset classification data to enable the computation of the consumer-wise cost to serve.	Voltage wise Asset Classification information was provide in the ARR and tariff petition for MSEDCL for FY 2006-07												
The Commission does not agree with the MSEB's suggestion of focusing on metering target only and directs the MSEB to pursue T&D loss reduction target as well as the metering target.	MSEDCL stated that it had already initiated number of measures to reduce the T&D losses and the directives have already been issued to all the zones and the monitoring is being done on regular basis by the headquarters MSEDCL has completed the DTC metering program and about 51762 DTCs have been metered so far (excluding AG sampling of 6760 DTCs). The Energy Accounting process has also been established for 46642 DTCs as on 30/10/05 and the necessary steps have been initiated for the reduction of DTC losses. All zones are instructed to bring the DTC losses below 25%												

Directives issued in tariff order FY 2003-04 and from time to time	Status on compliance (as submitted by MSEDCL to MERC in tariff petition for FY 2006-07)
<p>To adhere to the deadline for achieving 100% metering. The MSEB may consider innovative solutions like group metering, feeder level metering, etc. to achieve the metering targets.</p>	<p>MSEDCL stated that all 11, 22 & 33 kV feeder's metering has been completed. As on NOV. 05, 9.09 Lakh Agriculture consumers are metered & 16.65 lakh Agriculture consumers remained unmetered. It is proposed to provide meters to all Agriculture consumers by selecting a division per Zone, to be completed in next six month. As per Commission guidelines, a Road Map is prepared to provide meters to all Agriculture consumers. The copy of the road map was provided in the tariff petition for MSEDCL For FY 2006-07 MSEDCL proposed to meter all balance DTC's (about 1,60000) before March 2007. In this regard material procurement is in process</p>
<p>To utilize information available from Energy Audit data on LT-agricultural feeders for assessing unmetered LT-agricultural consumption for future submissions. Further, the MSEB should modify the sample size/ modify quality of sampling in line with statistical sampling norms, to ensure that the results of the energy audit are truly representative of the pattern of agricultural consumption in the entire State. Any abnormal variation in assessment results as compared to LT-agricultural norm should be highlighted and analyzed. The MSEB should monitor 12 month moving average of T&D loss and metered consumption every month.</p>	<p>MSEB has already initiated the process of improving the quality & quantity of samples. The number of samples has been increased from 1701 nos. in 2000-01 to 6760 nos. upto Oct 2005 & balance 1,60000 DTC will be metered before March 2007</p>
<p>MSEB should install ToD meters for all consumers with a connected load of over 20 kW, so that ToD tariffs can be availed by these consumers at their option.</p>	<p>MSEDCL stated that MSEB vide letter no 09777 dtd 7.04.2004 requested MERC to limit application to industrial and commercial consumers only, with connected load in excess of 20 kW. All CT operated meters are static TOD meters which are being installed to LT industrial/ commercial installations. Consumers having load more than 20 kW have TOD meters or are being replaced with TOD meters. Procurement & replacement is a continuous process.</p>
<p>The MSEB should further progress from Energy Accounting (i.e. compilation of data) to Energy Audit (i.e. to utilize Energy Accounting data to reduce the high level of losses on identified feeders).The MSEB has not submitted any concrete action plan to address the high level of losses demonstrated by particular areas. The MSEB should apply the principles of 'ABC Analysis' and identify the areas, which will generate the maximum revenue at the least cost and undertake loss reduction programmes in these areas immediately.</p>	<p>The Energy accounting report is forwarded to all the O&M zones/ Circles/division wise for imitating the steps for reduction of losses. The Managing Director, MSEDCL also conducts review for the reduction of losses from time to time & in the CE's review meeting on monthly basis. Further the internal Reforms program programme is being implemented with the objective of reduction of T&D losses. In this program DTC energy accounting has been undertaken & particularly the targets of loss reduction has been given to Nagpur(u) Zone, Aurangabad Zone, Beed Zone having high losses. DTC loss reduction program is under progress in all the O&M Zones.</p>
<p>Levy of Fixed Charges –MSEB to take all possible measures to maintain the voltages within the prescribed limits, and to limit the load shedding hours to the minimum.</p>	<p>MSEDCL stated: 1) Commission is appraised of the situation from time to time 2) Load shedding is done strictly in accordance with guidelines given in Principle & protocol of Load shedding order</p>
<p>Since the implementation of Availability Based Tariff (ABT) in the country, the grid discipline has improved substantially, and most other States are managing their energy requirements such that the incidence of paying UI charges is minimized. Moreover, there is an opportunity for the MSEB to purchase power at times of high frequency at very cheap rates, and the MSEB should actively explore this option to reduce its costs. The MSEB should maintain grid discipline as envisaged under the ABT regime. The MSEB, on the other hand has been incurring substantial expenditure on account of UI charges, which cannot be allowed in completely. Hence, the</p>	<p>MSEDCL stated that as per directives of MERC , the ABT mechanism is used to meet the energy requirement in the most optimal way & has resulted in improved grid discipline. The practice envisaged by MERC is implemented such that more is power purchased through UI at higher frequency when rates are less (cheaper). However, due to wide gap between generation & demand it is difficult to maintain the normative level of 1% of load energy input requirement.</p>

Directives issued in tariff order FY 2003-04 and from time to time	Status on compliance (as submitted by MSEDCL to MERC in tariff petition for FY 2006-07)
Commission has allowed UI charges at a normative level of 1% of total energy input requirement	

SOURCE ARR and Tariff petition for MSEDCL for FY 2006-07

Regulatory initiatives

Promotion of renewable energy

One of the measures being tried out by MERC to manage the load and reduce the demand supply gap is the promotion of renewable energy. The Commission has determined tariff for renewable energy technologies through Tariff Orders for a number of renewable sources. Tariff orders have been issued for the following renewable sources:

- Non-fossil fuel (bagasse) based co-generation – order dated August 16, 2002
- Non-fossil fuel (bagasse) based non-qualifying co-generation – order dated May 25, 2005
- Wind energy order dated November 24, 2003
- Biomass order dated August 8, 2005
- Small hydel order dated November 9, 2005
- Municipal; solid waste order dated April 6, 2004

MERC was also amongst the first commission to fix the Renewable Purchase Obligation (RPO). In its Order dated 3rd September 2004 on renewable purchase obligation, the Commission stipulated that the RPO for each licensee would be denominated in terms of percentage of 'gross input energy units' handled by the licensee for supplying power to their consumers.

MERC has fixed the “RPS Percentage Specification” and every ‘Eligible Person’ will have to procure electricity generated from eligible renewable energy sources at the percentages specified Table 8.56.

Table 8.56 Renewable Purchase Specification (RPS)

Year	Percentage
FY 2006-07	3%
FY 2007-08	4%
FY 2008-09	5%
FY 2009-10	6%

SOURCE MERC Order on Long term Development of Renewable Energy Sources and associated Regulatory (RPS) Framework dated August 16, 2006

The **Eligible persons** are all existing and future distribution licensees in Maharashtra as well as open access users and captive consumers.

Percentage RPS as stipulated above denotes minimum quantum of purchase from ‘co-generation and generation of electricity from renewable energy sources’

Operating Period: RPS framework would commence from 2006-07 and shall be co-terminus with the first control period of MYT regime, i.e., FY 2009-10. Upon gaining experience during this period, the Commission may decide to review and/or extend applicability of this RPS framework.

Applicable Tariff: The tariff rates and tariff structure as approved under respective Tariff Orders will be applicable.

The order stated that for the purposes of determination of the percentage of RPO, generation from all types of grid-connected renewable energy sources (such as wind energy, bagasse, solar energy or such other sources as approved by the Ministry of Non-Conventional Energy Sources, Government of India as constituting renewable energy) would be considered, with certain exceptions.

The Commission directed the Licensees to together work out detailed modalities, including accounting of energy, and formulate a mechanism for operationalising the RPO, in coordination with MEDA.

Demand Side Management (DSM)

MSEB has initiated pilot schemes for demand side management and energy conservation. Since MEDA (Maharashtra Energy Development Agency) has been designated as the implementation agency to carry out all energy conservation measures in the State of Maharashtra, most of these initiatives were passed on by MSEB to MEDA for implementation. Some of these schemes are¹:

- **Akshya Prakash Yojana:** This is a scheme under which a village (Goathan) can avoid load shedding in the evening by reducing the load voluntarily to 20% of the existing load. About 500 villages in Western Maharashtra have already adopted this scheme and are thus free from load shedding in the evening.
- **Voluntary Load Reduction Scheme in Small Cities:** Under this scheme, during the evening peak, the citizens reduce the load to 33% through self-control measures. When the load decreases to less than 33%, load shedding in the city is removed in the evening.
- **Single Phase Supply in Goathans:** Mainly consumers suffer from load shedding in the evening hours. In order that at

¹ Based on information available on Website of Maharashtra State Distribution Company, www.mahadiscom.in

least basic light is available in the households, single-phase transformers are being fixed in village goathans. Single-phase supply during evening peak has been today made available in about 700 villages.

- Scheme of Separate Feeders for Goathans: With the same purpose of providing evening lighting to village goathans, separate feeders are being set up for the goathans. Under this scheme also about 10,000 villages will be covered.
- Other DSM measures:
 - (a) Encouragement to CFL for saving of electricity.
 - (b) Introduction of capacitors on agriculture pumps and drinking water supply schemes.

In the FY 2006-07 petition, MSEDCL provided information to the Commission on its energy conservations measures in the following: -energy efficient lighting programme, reactive power management and Gram Urja Bachat Yojna. The MSEDCL submitted that under the efficient lighting programme (which includes replacement of GLS with CFL lamp), 3 lakh CFL had been sold in the pilot city of Nashik and a demand saving of 20 MW had been achieved. The utility stated that the programme will be replicated in other districts of Maharashtra in the next three years. Under the Reactive power management programme the aim is to improve existing power factor from 0.7 to 0.95 by installation of capacitors on LT side of distribution transformer.

MSEDCL stated that under the programme on installation of capacitor banks on agricultural pump, pilots schemes would be implemented in Dindori and Sangli districts of Maharashtra. In both districts the tendering process has been completed and work has started. The scheme is aimed to result in demand saving of 114 MVA. The Gram Urja Bachat Yojna would be implemented by MEDA. The scheme will be implemented for 819 Grampanchayat in Aurangabad and 632 Grampanchayat in Osmanabad. The estimated saving per year is Rs 1.27 Crore.

Time of Day Tariff (ToD)

The ToD tariffs for HT industrial categories were introduced in the Tariff Order for FY 2000-01. The introduction of ToD helped to manage the load better for this category and subsequently the Commission extended the ToD tariff for more categories and increased the differential between the peak and off-peak hours. In FY 2006-07 Order, the Commission revised the ToD tariffs by increasing the differential between peak and off-peak tariffs. The new TOD tariffs as per the FY 2006-07 order are given in Table 8.57.

Table 8.57 ToD tariffs in FY 2006-07

Timeslot	Existing ToD tariff based tariff) (Rs/unit)	(w. r. t	Revised ToD tariff (w. r. t based tariff)
2200 hrs-0600 hrs		-0.85	-0.85
0600 hrs-0900 hrs & 1200 hrs-1800 hrs		0	0
0900 hrs-1200 hrs		0.60	0.80
1800 hrs-2200 hrs		1.00	1.10

SOURCE Tariff order for MSEDCL for FY 2006-07

These ToD tariffs are applicable for the following categories- HTI industries, HT III –waterworks, HT VI-Seasonal industry and LT V-General Motive Power.

MYT framework

MERC, in its Regulations for 2005, gave MYT Framework and stated that the Commission shall specify a trajectory for determination of tariff for:

- A generating station,
- A generating company, and/or
- A Licensee in respect of his generation business.

The Utilities were to have submitted their tariff proposal in December 2005 for multi-year tariffs for 2006-07. However, the utilities urged the Commission to give more time to meet the data requirement for setting MYT. The Commission has now urged the utilities to submit ARR and tariff proposal under multi-year for 2007-08, 2008-09 and 2009-10 by November 31, 2006. The Commission is expected to come out with MYT tariffs on 1st April 2007 for the years FY 2007-08 to FY 2009-10.

Regulations issued by MERC

Table 8.58 lists all the important regulations issued by MERC.

Table 8.58 Important regulations issued by MERC

Regulation	Date of issue
Consumer Grievance Redressal Forum & Electricity Ombudsman Regulations, 2006	April 20, 2006
State Grid Code Regulations 2006	February 15, 2006
MERC (Standards of Performance of Distribution Licensees, Period for Giving Supply and Determination of Compensation) Regulations, 2005	January 20, 2005
MERC (Electricity Supply Code and Other Conditions of Supply) Regulations, 2005	January 20, 2005
MERC (Transmission Open Access) Regulations, 2005	April 21, 2005
MERC (Distribution Open Access) Regulations, 2005	June 5, 2005
MERC (Terms and Conditions of Tariff Regulations, 2005	August 23, 2005
MERC (Fees & Charges) Regulations, 2004	December 3, 2004
MERC (Standing Legal Counsels : Terms & Conditions of Appointment) Regulations, 2004	December 3, 2004
Transmission Licence Conditions Regulations 2004	June 10, 2004
Distribution Licence Conditions Regulations 2004	June 10, 2004
Trading Licence Conditions Regulations 2004	June 10, 2004
Procedure for filing appeal before the Appellate Authority Regulations 2004	June 10, 2004

Conduct of Business Regulations 2004	June 10, 2004
Terms and Conditions of Tariff Regulations 2004	June 10, 2004
Guidelines for in-principle clearance of proposed investment schemes	February 9, 2005
Terms and Conditions of Appointment of Consultants Regulations 2004	June 10, 2004
Consumer Grievance Redressal Forum & Ombudsman	December 10, 2003
State Advisory Committee	October 28, 2005

SOURCE Website of MERC - www.mercindia.org.in

Status of annual accounts

The annual accounts for MSEB for FY 2003-04 and FY 2004-05 are available. The Annual accounts for MSEDCL for FY 2005-06 are yet to be published. The delay in the annual accounts for MSEDCL for FY 2005-06 is on account of the unbundling the subsequent transfer of assets of MSEB to three utilities.

Power sector rating

Table 8.59 gives the rating of Maharashtra power sector under the rating exercise of MoP.

Table 8.59 Rating of Maharashtra power sector

	FY 2003-04	FY 2004-05	FY 2005-06
Rank	5	12	8
Score	60	37.25	35.4

The rating given to Maharashtra has been fluctuating. While it was ranked 5th in the rating released in January 2003, it slipped to the 12th position in the rating released in April 2005. Thereafter, in the latest rating exercise released in June 2006, the state has climbed back to the 8th Position.

Strengths

- Good operational performance of generation plants
- Low gearing of the utility
- Interface metering completed

Weakness

- Stagnant generation capacity in the state for last 5 years, leading to huge demand supply gap and load shedding through out the state.
- Free/subsidised power undermines the commercial viability of the power sector.
- Accumulated financial losses of Rs. 19.08 billion as on 31st March 2005.
- Aggregate technical and commercial losses of 26.61% for FY2004-05.
- Low metered sales (52%) of the total units input in the system.
- Delays in filing of tariff orders and average revenue realisation (ARR).

Conclusions

- MSEB was unbundled in June 2005 into three entities for generation, transmission and distribution. The distribution company now also manages trading activity.
- There has been little attention paid to generation capacity addition in recent years while demand has increase. As a result shortages have increased to around 18% in FY 2005-06 while peak shortages have increased to around 23%. These are much higher than the all India shortage level of 8.3% in FY 2005-06 and all India peak shortage of 12.3%.
- There have been differences between the Commission and the Maharashtra government on the disbursement of subsidy. The GOM wants to adjust the subsidy amount with the dues owed by the MSEB/MSEDCL. The regulatory Commission has ruled that the subsidy should be paid in advance and the adjustments cannot be accepted.
- MSEB/MSEDL has claimed that the T&D losses have declined from 38% in FY 2001-02 to 33% in FY 2005-06. Though the Commission did not scrutinize the T&D losses in FY 2004-05 and FY 2005-06, it was of the opinion that the losses, especially distribution losses had been under-projected. For FY 2006-07, the MERC approved T&D losses of 38%.
- Power purchase has increased in the total generation mix from 25.8% in FY 2003-04 to 28.9% in FY 2006-07
- Employee cost as a % of total ARR has increased marginally from FY 2003-04 to FY 2005-06. Employee cost per unit of sales has remained constant in the same period.
- The A&G expenses declined both as a% of ARR and per unit of sales from FY 2003-04 to FY 2004-05.
- Timeliness of issue of tariff orders has received a set back during the process of unbundling. The order for 2003-04 was issued in March 2004. Thereafter, no tariff order was issued in FY2004-05 and FY2005-06. The tariff order for FY2006-07 has come out in October 2006.
- Multiyear tariffs were to be released in April 2006. However on account of the unbundling and the consequent transfer of assets, data availability became an issue and the utility asked for an extension to file a multi-year ARR. Multiyear tariffs would now be issued in April 2007.

CHAPTER 9 Uttarakhand

Introduction

Uttarakhand was carved out of Uttar Pradesh and established as a separate state in November 2000. Uttarakhand Power Corporation Limited (UPCL) was set up in February 2001 to maintain transmission and distribution in the state.

Till June 2004, UPCL was the sole licensee for both transmission and distribution in the state. Thereafter, a separate corporation Power Transmission Corporation of Uttarakhand Limited (PTCUL) was formed to take over the transmission business and now UPCL is the sole licensee for distribution.

Uttarakhand Electricity Regulatory Commission (hereinafter referred to as UERC or Commission) was established in September 2002. UERC issued the first tariff order for UPCL for FY 2003-04 in September 2003. Subsequently, the UERC came out with a supplementary order in December 2003. This supplementary order was passed to resolve matters that had come up due to the division of assets and liabilities between UPPCL (Uttar Pradesh Power Corporation Limited) and UPCL and the policy directions issued by the State Government both of which came out subsequent to the original order¹. In this supplementary order, the cost items of UPCL for FY 2003-04 were reassessed. However, this order did not change the initial order of the Commission and was undertaken as an exercise as per the directive of the High Court.

UERC issued its second tariff order for FY 2005-06 in April 2005. This order determined the tariffs for FY 2005-06 and reviewed the cost estimates of FY 2004-05. The Transmission Company (PTCUL) and the Discom (UPCL) had filed separate petitions, but the Commission came out with a single tariff order, giving separate details for both the licensees.

Demand supply gap

¹ The two corporations, UPPCL and UPCL agreed upon the division of assets and liabilities on 12th October 2003 and the State Government issued the policy directives on 16th October 2003. The tariff order for FY 2003-04 was released by the Commission in September 2003. UPCL appealed to the High court for a re-look at its tariffs after the transfer scheme came into effect. The High Court asked the Commission to review the costs based on the additional information made available by UPCL and on the basis of the transfer scheme.

The peak shortages in Uttaranchal have increased over the years, reaching 13.52% in FY 2005-06 from 5.15% in FY 2004-05. These shortages are, primarily, in the winter months and in summers the state generally has a surplus due to the good performance of its hydel plants. The overall energy shortage in Uttaranchal was 2.9 % in FY 2005-06. Table 9.1 and Figure 9.1 give the details from FY 2003-04 to FY 2005-06.

Table 9.1 Demand/Supply Scenario

Power Supply Position		FY 2003-04	FY 2004-05	FY 2005-06
	Requirement (MU)	4197	4628	5155
	Availability (MU)	4108	4470	5008
Energy (Mus)	Shortage (%)	2.17	3.53	2.9
	Peak Requirement (MU)	777	846	991
	Peak Met (MU)	737	794	857
Peak (MW)	Peak Shortages (%)	5.15	6.15	13.52

SOURCE Monthly review of power sector (executive summary), Central electricity Authority, www.cea.nic.in

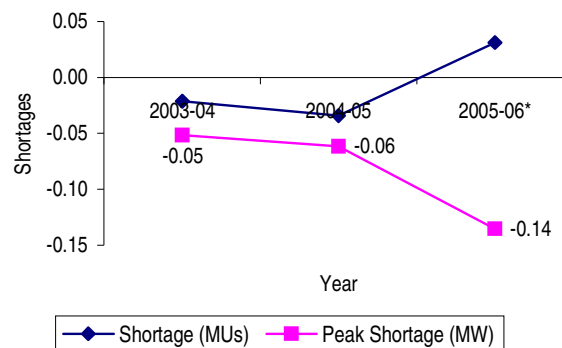


Figure 9.1 Power supply position

SOURCE Monthly review of power sector (executive summary), Central Electricity Authority, www.cea.nic.in

Installed capacity

As on 31st October 2006, the total available capacity in Uttaranchal was 2160 MW. This comprises 1020 MW of state sector, 400 MW of private sector and 740 MW from central generating stations. Table 9.2 and Figure 9.2 give the details of the same.

Table 9.2 Installed capacity for Uttaranchal

Capacity (MW)	FY 2005-06	%
State Sector	1019.71	47%
Private/licensee	400	19%
Share in Central Sector	740.56	34%
Total Available Capacity	2160	100%

SOURCE http://www.powermin.nic.in/JSP_SERVLETS/internal.jsp (as on 31st October 2006), Accessed during May-July 2006

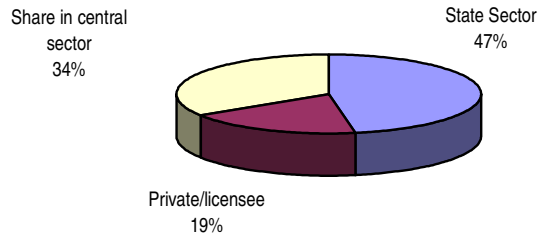


Figure 9.2 Installed capacity MW (ownership)

SOURCE http://www.powermin.nic.in/JSP_SERVLETS/internal.jsp (as on 31st October 2006)

Table 9.3 Installed capacity by fuel

	<i>MW</i>	<i>% share in total</i>
Hydro	1818.16	84%
Thermal	301.05	14%
Renewable	32.77	2%
Nuclear	16.28	1%
Total	2168.26	100%

SOURCE http://www.powermin.nic.in/JSP_SERVLETS/internal.jsp (as on 31st October 2006)

Hydro is the main source of power generation for Uttaranchal. The 14% thermal capacity is on account of the power received from the state's share in central sectors thermal plants. Figure 9.3 gives the fuel mix in Uttaranchal.

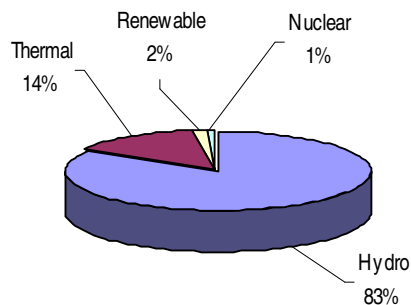


Figure 9.3 Fuel Mix

SOURCE http://www.powermin.nic.in/JSP_SERVLETS/internal.jsp (as on 31st October 2006)

Uttaranchal has a huge potential for hydel power generation. The following box gives a brief on this hydel potential.

Box 9.1 Hydro potential in Uttaranchal¹

The state has an identified hydropower potential of about 15000 MW. Out of this potential, only about 8% has been developed so far. The generation capacity addition plan for the X plan (2002-07) had envisaged an addition in hydropower capacity by 4383 MW. Central sector utilities viz. NHPC and THDC have taken lead in developing hydro projects in State for over 80% of planned capacity addition for X Plan period followed by private sector (9%) and State Sector (7%). However, as per present indications and based on the information so obtained from UJVNL, it is likely to be 2984 MW against 4383 MW for Xth Plan period. The projects slipping in to the XIth Plan period (2007-12) include 400 MW Koteshwar and 1000 MW Tehri II in central sector, being developed by THDC.

Source: Study on "Hydropower Development in India: A Sector Assessment" undertaken by TERI

Uttaranchal is a power surplus state for about 7-8 months in summer (from April to around October –November). This is due to nature of hydro generation and also because the demand for power is higher in the state during the winter months. In these months it under-utilizes the capacity available from the Central Generating Stations (CGS). The state government has allowed UPCL to sell part of its CGS share to other states (trading). The government earns 85% of the margin (profit) and UPCL gets the remaining 15% as service charge.

The generation in the state sector from FY 2002-03 to FY 2005-06 is given in Table 9.4.

Table 9.4 Generation over the years in Uttaranchal state sector only (UJVNL only)

Year	MU
FY 2002-03	3426
FY 2003-04	3392
FY 2004-05	3111
FY 2005-06	3493

SOURCE CEA monthly generation report (actuals)

As can be seen from the table above, generation from UJVNL declined sharply in FY 2004-05. This was on account of lower generation from a number of its plants as compared to other years. The Chibro (240 MW) for instance produced 636 MU in FY 2004-05 compared to 805 MU in FY 2005-06. Similarly the Khodri (144 MW) produced 301 MU compared to 378 MU in FY 2005-06.

¹ Study on "Hydropower Development in India: A Sector Assessment" undertaken by TERI

There has been little capacity addition in the state sector since FY 2001-02. However, this can also be on account of the fact that hydro projects have a longer gestation period than others. Construction work is currently underway for two projects in the state, viz., Pala Maneri (Stage 1 -480 MW) and Maneri Bhali (Stage II- 304 MW). Table 9.5 gives the movement in installed capacity over the years.

Table 9.5 Installed Capacity from FY 2001-02 to FY 2005-06

	FY 2001-02	FY 2002-03	FY 2003-04	FY 2004-05	FY 2005-06
State sector	500	978	986	-	1019

SOURCE Figures for FY 2001-02 to FY 2003-04 are from the SEB report published by Power Line Research, India Infrastructure. The figure for FY 2005-06 is from Monthly review of power sector (executive summary), Central Electricity Authority.

Analysis of tariff orders FY 2003-04 and FY 2005-06

In the following sections, the distribution tariff orders for FY2003-04 and FY 2005-06 have been analysed. It should be noted that in FY 2003-04, for purpose of comparison the approved figures are those that the Commission approved in the original tariff order of FY 2003-04 (issued in September 2004). The revised approved figures for FY 2003-04 (as per the supplementary order issued in December 2003) are discussed briefly in the main chapter. An annex at the end of the chapter discusses these revised figures in greater detail. It should be noted that the revised cost estimates for FY 2003-04 did not have any bearing on the tariffs for FY 2003-04 as they were to be recovered from a 'Transitional Contingency reserve', provision for which was made in the original tariff order of FY 2003-04. The actuals for FY 2003-04 are taken from the audited accounts of UPCL.

In the Tariff order for FY 2005-06, the Commission also discussed some of the costs elements of FY 2004-05. These have been studied for this report to the extent possible depending on the information available. The approved figures for FY 2004-05 are also taken as the actuals for the year as the Commission approved those figures after undertaking a detailed scrutiny of the expenditure (prudence check based on Monthly trial balance and pay bills of UPCL and PTCUL). The audited accounts for FY 2004-05 are not available.

For FY 2005-06, in order to maintain consistency, we have considered cost elements based on the aggregate of both UPCL and PTCUL. The actuals for FY 2005-06 are revised estimates of UPCL and PTCUL combined based on actuals for six months (April-September 2005) and projections for the remaining six months. These actuals (revised estimates) have been taken from UPCL and PTCUL petition for FY 2006-07.

FY 2002-03 in retrospect

UPCL had a surplus of Rs 12.41 Crore in FY 2002-03 as per the Profit & Loss account prepared by the Chartered Accountants.

Consumption and access

Sales/Demand estimation

In the tariff order for FY 2003-04, the Commission did not agree with the method adopted by the petitioner to calculate consumption. UPCL estimated its growth in energy consumption for FY 2003-04 based on its investment plan such that the tariff should recover the additional investment being made. UPCL was also of the opinion that the growth rate for the previous years (FY 2002-03 over FY 2001-02) was not encouraging. UPCL also claimed that its sales forecast for FY 2003-04 was based on an econometric model; however, it did not submit details of this model to the Commission.

The UERC, however, found even the sales growth trend in 2001-02 and 2002-03 as “unsustainable”¹. The Commission then estimated the sales based on the “past trend and adjustments to reflect the effect of known and measurable changes with respect to the number of consumers, the connected load and the energy consumption.” The known and measurable changes included the utility’s plan for expansion of capacity, change in operating conditions and consumer’s price elasticity of demand.

Detailed methodology for sales estimation

The Commission followed a two-step approach for estimating consumption in FY 2003-04. The number of consumers and connected load for FY 2003-04 was estimated by applying trends in growth rates for the past years on the base-year of FY 2002-03 and adjusting it for the other factors. In the second step, to determine the energy requirement for each consumer category, the specific consumption in FY 2002-03 was taken as the base and the trend growth rates for average specific consumption before FY 2001-02 were used.

The difference between the proposed and approved figures is due to the unmetered consumption in agriculture and domestic, a large part of which was not considered by the Commission. Figure 9.4 gives the trend in sales as approved by the Commission.

¹ The Commission argued that the sales (power position) increased due to separation of Uttaranchal from Uttar Pradesh after which most of the hydel stations came to Uttaranchal.

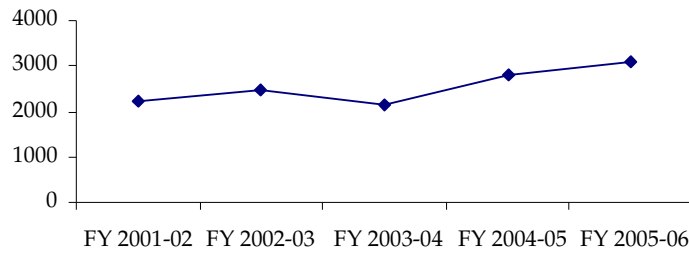


Figure 9.4 Trend in sales (MU)

SOURCE Tariff order for UPCL for FY 2003-04 and FY 2004-05

Method for estimating un-metered consumption (Agriculture)

In the tariff order for FY 2003-04, the Commission did not accept petitioners claim of PTW (Public Tube Well) consumption as 200 units/BHP/month (as against the norm of UP of 68.38 units/BHP/month). The petitioner's claim of 200 units/BHP/month translated into a tube well running for around 9 hours per day for all 365 days against an accepted norm of 3 hours daily.

The following box discusses in detail the procedure followed by the Commission to estimate unmetered consumption.

Box 9.2 Procedure for estimating un-metered consumption FY 2003-04

1. Considered monthly CS-3 statement for financial year 2002-03 filed by petitioner
2. Accepted the petitioner's filing of the proportion of unmetered consumers and residential societies in the domestic category and the unmetered consumption in the commercial category
3. Adopted the same load factor for unmetered domestic and commercial as that of metered category, since both are receiving 24 hours supply
4. The consumption of Private tube wells was estimated assuming a specific consumption of 68.38 units per BHP per month as per Tyagi Committee Report, which implies tube well utilization rate of 1100 hours per kW per year
5. Public lamps consumption calculated on the basis of 12 hours use for urban areas and 10 hours for rural areas
6. State tubewell consumption based on the estimate of 3562 units per pump per month as followed by UPERC (assuming 85% of pump sets are working on an average, average rating of pumps sets of 18.73 BHP and average usage of pump sets of 10 hours per day)

Category-wise sales

Table 9.6 gives the proposed and approved sales for the different categories of consumers for FY 2003-04.

Table 9.6 Category wise movement in sales (MU)

	Consumer Category	Proposed	Approved	Actuals
1	Domestic	1179.32	974.09	987
2	Non-domestic	289.89	236.2	523
3	Public lamps	24.14	27.61	31
4	Irrigation	389.49	145.48	363
a)	Private tube wells	301.49	103.33	269
b)	State tube well	78	30.17	88
c)	Pump canals	10	11.98	6 ³
5	Public water works	171.8	165.2	136
6	LT and HT industry	573.37	588.42	656
a)	LT industry	93.26	87.8	90
b)	HT industry	480.11	500.62	566
7	Temporary supply		0.19	0
8	Bulk supply		1.41	2 ¹
	Total	2628.01	2138.6	2698

SOURCE UPCLTariff order FY 2003-04 for proposed and approved figures and UPCLTariff order FY 2005-06 for actuals

In FY 2003-04, there is a difference of around 18% in the sales approved by the Commission as against the sales proposed by UPCL. Further, there is a difference of around 26% in the total sales approved by the Commission and the actual total sales. The main difference is on account of agricultural consumption, a major proportion of which the commission has not allowed. The actual agricultural consumption is nearly the same as the proposed consumption. There is substantial difference of about 80% between the approved and actual consumption of the Commercial category. Table 9.7 gives the sales for FY 2004-05 and FY 2005-06.

Table 9.7 Sales update for FY 2004-05 and proposed vs. approved sales for FY 2005-06

Consumer Category	Proposed	Approved	Proposed	Approved	Actuals ²	%	%
	FY 2004-05 (1)	FY 2004-05 (2)	FY 2005-06 (3)	FY 2005-06 (4)	FY 2005-06	(1) -(2)	(3) -(4)
Domestic	1056	1045.41	1140.1	1121.25	1077	0.06%	0.89%
Non-domestic	595	595.35	678.54	684.58	686	-21.70%	-34.18%
Public lamps	46	36.02	54.94	36.16	52	-67.23%	-69.85%
Private tube wells	310	101.59	340.49	102.65	139	-63.47%	-67.67%
Government irrigation system	110	40.18	126.43	40.88	37	-0.10%	0.00%
Public water works	143	142.86	150.01	150.01	176	0.01%	0.00%
LT and HT	823	823.1	940.61	940.61	922	0.08%	0.00%

¹ Includes the category of "extra state consumer" with consumption of 2 MU in FY 2003-04.

² Based on six months actual (April-September 2005) given in ARR petition for 2006-07 of UPCL

Consumer Category	Proposed	Approved	Proposed	Approved	Actuals ²	%	%
	FY 2004-05 (1)	FY 2004-05 (2)	FY 2005-06 (3)	FY 2005-06 (4)	FY 2005-06	(1)-(2) ¹	(3)-(4)
industry						-1.00%	-1.65%
LT industry	99	99.08	107.99	107.99	94	0.00%	0.02%
HT industry	724	724.02	832.62	832.82	828		0.00%
Railway	0		11.65	11.65	14		
traction							
Others	11						
Total	3094	2784.51	3442.77	3087.79	3103	-10.00%	-10.31%

SOURCE Tariff order FY 2005-06 for proposed and approved figures and UPCL Tariff petition of UPCL FY 2006-07 for actuals

In both FY 2004-05 and FY 2005-06, there is a difference of about 10% between the sales proposed by UPCL and the total sales approved by the Commission.

In all the years, agricultural sales approved by the Commission were approximately 60-65% lower than the proposed amount. The reason given by the Commission for this was that UPCL was hiding a lot of inefficiencies in its T&D system by accounting it in the unmetered agricultural consumption.

The difference in the proposed and approved consumption in agriculture could be because UERC based its estimates on the Tyagi Committee report (the survey for which was conducted for undivided Uttar Pradesh). In its survey, the Tyagi Committee did not include any hilly area (most of which forms part of Uttaranchal now). In these hilly areas (Uttaranchal), power is available for pumpsets for 24 hours whereas in Uttar Pradesh power is available for pumpsets for only 6-8 hours. The average consumption estimated by Tyagi Committee is based on 6-8 hours of supply available to agricultural consumers in Uttar Pradesh.

The share of each category in total sales for FY 2003-04, FY 2004-05 and FY 2005-06 is given in Table 9.8. The sales for FY 2003-04 are based on actuals while that of FY 2004-05 and FY 2005-06 is based on approved figures.

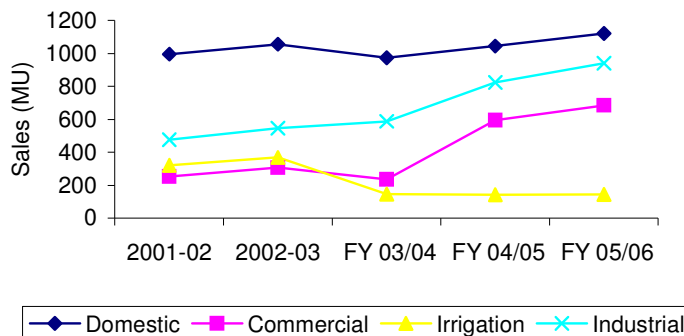
Table 9.8 Share of each category in total sales (%)

Consumer Category	Actual	Approved	Approved
	FY 2003-04	FY 2004-05	FY 2005-06
Domestic	36.58%	37.54%	36.31%
Non-domestic	19.20%	21.38%	22.17%
Public lamps	1.15%	1.29%	1.17%
Private tube wells	9.97%	3.65%	3.32%
Government irrigation system	3.26%	1.44%	1.32%
Public water works	5.26%	5.13%	4.86%
LT and HT industry	24.31%	29.56%	30.46%
LT industry	3.34%	3.56%	3.50%
HT industry	20.98%	26.00%	26.97%
Railway traction	0.00%	0.00%	0.38%
Others	0.26%	0.00%	0.00%
Total	100.00%	100.00%	100.00%

SOURCE TERI estimates based on sales information available in Tariff order FY 2005-06

There is not much change in the consumption pattern over the last 3 years. The difference in agricultural consumption over the years is because the Commission has approved consumption based on its own estimation in FY 2004-05 and FY 2005-06 whereas the consumption for FY 2003-04 is based on the actuals as stated by UPCL. Further difference is in case of HT industrial consumption. The share of this category has increased from 21% in FY 2003-04 to around 27% in FY 2005-06.

Figure 9.5 gives the growth in sales across major categories from FY 2001-02 to FY 2005-06

**Figure 9.5** Growth in sales across major categories

SOURCE Tariff order of UPCL for FY 2003-04 and FY 2005-06

Total sales grew at the CAGR rate of 8.5% from 2001-02 to FY 2005-06. Domestic consumption grew at only 3% and agricultural consumption declined at a CAGR of 18% over the same period. Commercial consumption grew the most at a

CAGR of 28% while industrial consumption grew at a CAGR of 18%.

There is a decline in agricultural/irrigation consumption. This is due to the fact that UERC did not accept the high consumption shown by UPCL on account of agriculture. Industrial and commercial consumption has increased steadily since FY 2003-04.

Number of consumers and connected load

Table 9.9 and Figure 9.6 give the total consumer base and connected load over the years.

Table 9.9 Growth in consumer base over the years

Year	Total Consumer Base (in '000)	Connected load (MW)
FY 2001-02	841	1466
FY 2002-03	868	1548
FY 2003-04	901	1662
FY 2004-05	970	1772
FY 2005-06	1056	2053

SOURCE <http://www.upcl.org/growthsale.html>

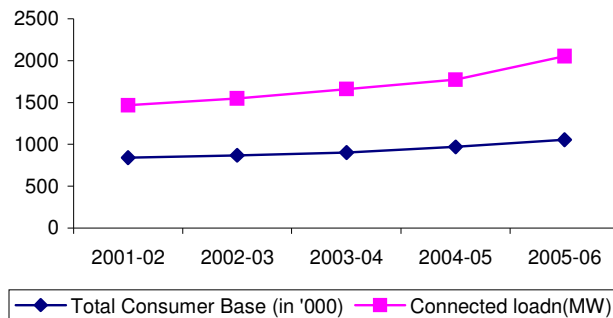


Figure 9.6 Growth in consumer base and connected load (FY 2001-02 to FY 2005-06)

SOURCE <http://www.upcl.org/growthsale.html>

The total consumer base grew at a CAGR of 5.27 % from FY 2000-01 to FY 2005-06 as seen in the graph above. The connected load grew at a CAGR of 8.79% from FY 2001-02 to FY 2005-06.

Consumer Mix

Table 9.10 gives the number of consumers across major categories in FY 2003-04 and FY 2005-06.

Table 9.10 Consumer mix (Number of consumers)

Category	FY 2003-04	FY 2005-06
Domestic	777608	839531
Non-domestic	90648	108692
Agriculture	18116	17293
Industry	8305	5964
Total	901000	1056000

SOURCE UPCL tariff order and UPCL petition for FY 2005-06

The total number of consumers has increased by around 17% from FY 2003-04 to FY 2005-06. Over the two year period, the highest increase has been in the commercial category, i.e., 20% followed by domestic consumers at 8%. In contrast to the above, the number of consumers in industrial and in agricultural categories have shown a decline of 28% and 4.5% respectively.

Table 9.11 gives the connected load in each of the major consumer categories for FY 2003-04 and FY 2005-06.

Table 9.11 Connected load (KW)

Category	FY 2003-04	FY 2005-06
Domestic	974033	997000
Non-domestic	201613	364000
Agriculture	115598.8	112162
Industry	261623	315000
Total	1662000	2053000

SOURCE Tariff order FY 2003-04 and UPCL petition for FY 2005-06

There is an increase of approximately 23% in the overall connected load from FY 2003-04 to FY 2005-06. In the domestic category, the connected load has increased by a marginal 2% while in the agricultural category it has declined by around 3%. In the commercial category, the load has increased by 80% while in the industrial category; it has increased by around 20%. Table 9.12 gives the consumer mix and connected load for FY 2005-06 for the major consumer categories.

Table 9.12 Consumption mix and connected load

Category	Consumer Mix	Connected load
Domestic	79.5%	48.56%
Non-domestic	10.29%	17.73%
Agriculture	1.64%	5.46%
Industry	0.56%	15.34%

SOURCE TERI estimate

In FY 2005-06, the domestic category comprised around 80% of total consumer base and around 48.5% of the total connected load. Industrial category comprises only 0.56% of total consumer base but around 15% of total connected load. Non-

domestic category comprised around 10% of consumer based and around 18% of connected load. Agriculture comprised 1.64% of consumer based and around 5.5% of connected load.

The connected load per consumer across all the major categories for FY 2003-04 and FY 2005-06 is given in Table 9.13.

Table 9.13 Connected load per consumer (KW)

Category	FY 2003-04	FY 2005-06*
Domestic	1.25	1.19
Non-domestic	2.22	3.35
Agriculture	6.38	6.49
Industry	31.50	52.82

*these are based on figures proposed by the Commission

SOURCE Tariff order FY 2003-04 and tariff petition for FY 2005-06

The connected load for domestic consumers at 1.25 kW in FY 2003-04 and 1.199 kW in FY 2005-06 is very low. It should be noted that in case of the domestic category while the number of connected consumers has increased, their average connected load has declined. This could be on account of under-reporting of load by the consumers. In the commercial category, connected load per consumer has increased from 2.22 kW in FY 2003-04 to 3.35 in FY 2005-06, which is a positive sign. Figure 9.6 (A) gives the category wise share in total revenue in FY 2005-06. It can be seen from the figure that the industrial consumers contribute the highest to the total revenue from sales.

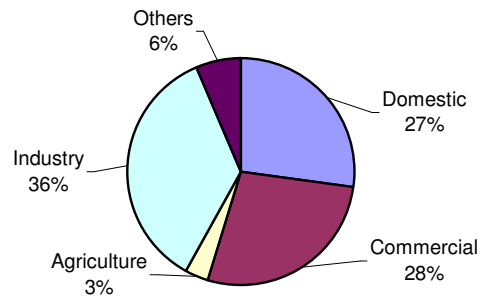


Figure 9.6 (A) Category wise share in total Revenue in FY 2005-06

SOURCE Tariff order for UPCL for FY 2005-06

Table 9.14 gives the average consumption per consumer for various categories is given below.

Table 9.14 Average consumption per consumer

Category	FY 2003-04			FY 2005-06*		
	No of Consumers	Consumption (approved) (MU)	Average Consumption per consumer (KWH)	No of Consumers	Consumption (approved) (MU)	Average consumption per consumer (KWH)
Domestic	777608	974	1252.56	839531	1121.25	1335.57
Non-domestic	90648	236	2603.48	108692	684.58	6298.35
Agriculture	18116	145.5	8031.57	17293	143.53	8299.89
Industry	8305	588.42	70851.29	5964	940	157612.34
Total	90100	2138.6	2373.58	1056000	3087.79	2924.04

* while the sales (consumption) is based on the approved figures, the number of consumers is as per the figures proposed by UPCL

SOURCE Tariff order FY 2003-04 & FY 2005-06 and Tariff petition for UPCL for FY 2005-06

As can be seen, consumption per consumer for each category has increased over the two-year period. The increase is higher in case of commercial and industrial consumers. This increase could partly be explained by improved metering (of consumption) rather than an actual increase.

Status of rural electrification

Village electrification

Table 9.15 gives a status report on the rural electrification in Uttaranchal.

Table 9.15 Status of village electrification

Total numbers of villages in Uttaranchal(Census 2001)	15761
Total number of villages Electrified as on 31/03/2005	13998
Total Number of villages Electrified by UREDA as on 31/03/2005	604
Balance villages to be Electrified	1159
Number of villages proposed under RGGVY scheme	782

SOURCE UPCL website

As per the Table 9.15 around 89% of villages have been electrified in the state. Out of the 1159 villages still remaining to be electrified, 782 or 67% of the villages will be covered under the RGGVY scheme.

Table 9.16 gives the status of household electrification in rural areas.

Table 9.16 Status of household electrification

Total number of rural Households	Households having Electricity	% Electrified Households	Unelectrified Households	% Unelectrified Households
1196157	602255	50.03	593902	49.65

SOURCE www.powermin.nic.in

Around 50% of rural households have access to electricity out of a total of 1196157 households.

Efficiency improvement

Transmission & Distribution (T&D) loss estimation

UPCL in its petition for FY 2003-04, had stated its energy losses as T&D losses without taking into account quantum of energy supplied to other states. It stated that the loss levels in FY 2002-03 were 35.33%, which would reduce to 34.12% in FY 2003-04.

The Commission, however, was of the view that the T&D loss level for FY 2002-03 was actually 46.17%. According to the Commission, this loss level had remained hidden on account of inaccurate representation of the quantum of consumption in the un-metered connections in the PTW, domestic and commercial categories.

The Commission factored in a technical loss reduction of 1% and a target of 3% reduction in commercial losses. Thus, the overall loss reduction target for FY 2003-04 was taken as 4% and target loss level as 42.17% (taking base level losses of previous year at 46.7%). The Commission expected similar levels of loss reduction in the next four years and a total reduction of about 20% in a span of five years. The targeted loss level is the amount of losses that the UERC approves each year.

Table 9.17 Target loss level (%)

Year	Target /Approved loss level
	(%)
FY 2002-03	46.17
FY 2003-04	42.17
FY 2004-05	38.17
FY 2005-06	34.17

SOURCE Tariff order for UPCL for FY 2003-04

In the ARR filing for FY 2004-05 and FY 2005-06, UPCL claimed its T&D losses as given in Table 9.18. It claimed that its losses are based on loss level for sales within the state and assumption of 4% losses external to its system (for power available from CGS station). Table 9.18 gives the loss levels claimed by UPCL from FY 2003-04 to FY 2005-06.

Table 9.18 T&D losses (as claimed by UPCL)

	FY	FY	FY	FY
T & D loss (%) ¹	2002-03	2003-04	2004-05	2005-06
Losses for sales within state	31.50%	30.90%	29.28%	27.30%
Loss external to UPCL system	4%	4%	4%	4%
Total T&D losses	35.5%	34.9%	33.28%	31.3%

SOURCE Tariff order for UPCL for FY 2005-06

The Commission did not accept these low figures and asked UPCL to reduce its losses as per the trajectory given in order of FY 2003-04 with losses at 46.17% in FY 2002-03 as the base level losses. Thus there are still differences between the base level T&D losses as reported by UPCL and as approved by the Commission.

The reason for the higher T&D estimate by the Commission could be on account of sales to agricultural consumers. In FY 2003-04, UPCL had proposed consumption for irrigation (comprising private tubewell, state tubewell and pump canals) as 389.5 MU. The Commission approved only 145.5 MU. This difference of 244 MU could have been accounted as T&D losses by the Commission in its estimates.

Box 9.3 gives some of the initiatives taken by UPCL to reduce commercial losses.

Box 9.3 Measures to reduce commercial losses²

1. Concentrated action on divisions with highest arrears in industrial and commercial categories
2. Formation of pilot groups to resolve disputes and increase realization
3. Drive initiated to replace all electromechanical meters by pilfer proof electronic meters with cubical at commercial and industrial establishments
4. All new connects released with pilfer proof meters
5. Regular checking by utility staff
7. Detailed analysis of revenue information to maximize revenue with optimum efforts

SOURCE Tariff order for UPCL for FY 2003-04

Collection efficiency

Table 9.19 gives the trend in collection efficiency from FY 2001-02 to FY 2004-05.

Table 9.19 Collection efficiency from FY 2001-02 to FY 2004-05

¹ These figures are taken from the Uttaranchal Tariff Order for FY 2005-06. The figures for 2002-03 are actuals, figures for 2003-04 are provisional, figures for 2004-05 are revised figures and figures for 2005-06 are proposed.

² As per the petitioner (Tariff Order 2003-04),

	FY 2001-02	FY 2002-03	FY 2003-04	FY 2004-05 (upto 31 Oct 04)
Opening Balance (Rs Crore)	629.25	682.06	824.78	1009.65
Dues during the year (Rs Crore)	257.48	710.94	846.81	454.67
Total Dues (Rs Crore)	886.73	1393.00	1671.59	1464.32
Collection during the year (Rs Crore)	204.67	541.37	565.02	320.26
Collection as % of total dues	23.08	38.86	33.80	21.87
Collection as % of the dues accrued during the year	79.49%	76.15	66.72	70.44

SOURCE Tariff order of UPCL FY 2005-06

AT&C Loss

Collection efficiency shows a declining trend from FY 2001-02 to FY 2003-04 but has improved marginally in FY 2004-05¹.

AT&C losses increased from 40.74 % in FY 2002-03 to 42.85% in FY 2004-05. This is partly explained by the decrease in collection efficiency from 76% in FY 2002-03 to 70% in FY 2004-05. Table 9.20 gives the trend in AT&C loss from FY 2002-03 to FY 2004-05.

Table 9.20 AT&C losses

	AT&C losses
FY 2002-03	40.74
FY 2003-04	43.38
FY 2004-05	42.85

SOURCE As per PFC estimates

http://www.apdrp.com/apdrp/projects/pdf/AT&C_Loss_of_Power_Uilities.pdf

Metering

Metering at the 11 kV level has been completed in the state. All 11 kV feeders are metered. There is, however, a problem of insufficient metering at the distribution transformer level. Of the 24412 distribution transformers, only 989 are metered and the percentage metering is only 4%. The overall consumer metering as the MoP data is 78% in FY 2005-06 as given in Table 10.21.

Table 10.21 Status of metering (FY 2005-06)

Particulars	FY 2005-06		
	Numbers	Metered	%age
11 kV Feeders	1008	1008	100%
Distribution transformer	24412	989	4%
Consumer metering (in lakhs)	9.87	7.73	78%

SOURCE Website of Ministry of Power, www.powermin.nic.in

¹ It has to be noted that the figure for FY 2004-05 is only for 7 months

Table 9.22 gives the status of metering for different consumer categories as per the UERC.

Table 9.22 Status of Consumer Metering as on 31st December 2005

	Metered	Unmetered	Totals	% of metering
Domestic	839,273	32,830	872,103	96.24%
Commercial	101,087	0	101,087	100.00%
Public lamps	220	0	220	100.00%
Dept employees	124	7,961	8,085	1.53%
Public institutes/govt bodies	2,377	0	2,377	100.00%
State tubewells	689	0	689	100.00%
Private tubewells	5,940	11,858	17,798	33.37%

SOURCE Data provided by UERC

Though metering is high in almost all categories, there are problems of defective meters. UERC has passed directives on a number of occasions urging UPCL to replace defective meters. As per the information with the Commission, Uttaranchal has a total of 51184 consumers with defective meters, i.e., 5% of the total consumer base. Figure 9.7 gives the status of consumer metering.

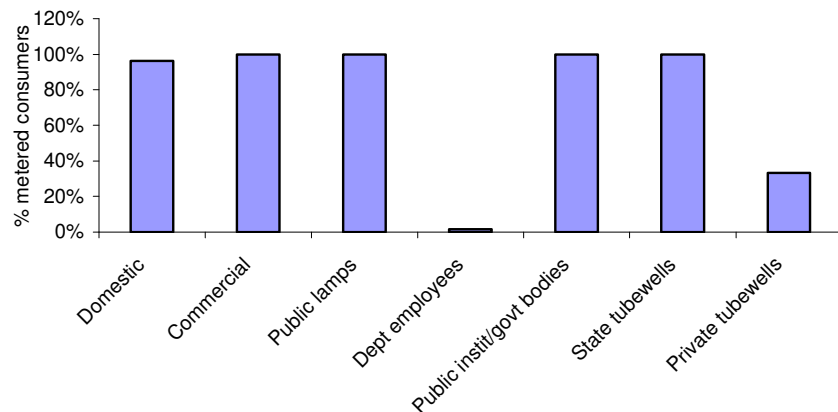


Figure 9.7 Consumer metering
SOURCE Data provided by UERC

Power purchase

Table 9.23 summarises the quantum of power purchase and the cost of power purchase for FY 2003-04, FY 2004-05 and FY 2005-06.

Table 9.23 Power Purchase Cost¹: (Proposed/Approved)

	FY 2003-04		FY 2004-05		FY 2005-06	
Rs Crore	Quantity of power purchase (MU)	Total cost of power purchase (Rs crore)	Quantity of power purchase (MU)	Total cost of power purchase (Rs Crore)	Quantity of power purchase (MU)	Total cost of power purchase (Rs Crore)
Proposed	3989.1	389.8	4667	544.5	5069	615.13
Approved	3900	370.68	NA	503.38	4810.17	535.75
Actuals		585.5 ²			4843	625.7

SOURCE Tariff order for UPCL for FY 2003-04 and FY 2005-06, audited accounts for FY 2003-04 and tariff proposal for UPCL and PTCUL of FY 2006-07.

Table 9.24 gives the trend in quantum of power purchased.

Table 9.24 Quantum of power purchase from firm sources (FY 2003-04 to FY 2005-06)

	FY 2003-04 (Approved)	FY2004-05 (Petition)	FY 2005-06 (Approved)
UJVNL main station (MU)	2957	2573	2934
Total CGS (MU)	872	1825	1809
Total dispatch from firm sources (MU)	3901	4425	4810

SOURCE Tariff order for UPCL FY 2003-04 and FY 2005-06

The sources of power for Uttaranchal are UJVNL (main generating stations-Pathri and Mohammadpur), UREDA (small and micro-hydel) and Central Generating Stations (comprising of generating stations of NTPC, NHPC and NPC). In FY 2003-04, the Commission found discrepancies in the power availability from different sources proposed by UPCL and arrived at the following figures after its own scrutiny.

Table 9.25 Status availability: proposed and approved (MU)

	Proposed	Approved
Availability from UJVNL	2963	3070
Availability from CGS	2039	2155.79
Others	71	72.07
Total	5073	5297.88

SOURCE Tariff order for UPCL FY 2003-04

Based on merit dispatch the Commission apportioned the power available as given in Table 9.26.

¹ includes transmission charge paid to PTCUL

² actuals as per the audited accounts of UPCL for 2003-04

Table 9.26 Availability based on merit order for FY 2003-04

	Total	Required for sale within state	Available surplus
UJVNL	3070	2983	87
CGS	2156	918	1238
Others	72	0	72
Total	5298	3900	1398

SOURCE Tariff order for UPCL FY 2003-04

It can be seen that since UJVNL offered the cheapest source of power, the Commission wanted UJVNL to provide for almost the entire power requirement of the state. It is to be noted that the Commission also did not apportion the category of “others” for own consumption. This “others” category comprised of IPPs and micro-hydel which are much more expensive. Later, however the government directed UPCL to purchase power from micro-hydel ahead of the merit order. The changes as a result of the directive led to changes in cost of power purchase which were settled by the UERC in the supplementary order of FY 2003-04.

Table 9.27 below gives the quantum of energy available in FY 2005-06.

Table 9.27 Availability: proposed and approved (MU) in FY 2005-06

	Proposed	Approved	Actual
Availability from UJVNL	2603.69	2970.88	3370
Availability from CGS	2178.59	2178.59	1633
Others	29.21	29.21	
Under Banking	220.12	10.48	
Total	5031.61	5189.16	5033

SOURCE Tariff order for UPCL FY 2005-06

The power availability from different sources was approved by Commission based on merit dispatch principles. The generation from small hydro stations was considered ahead of the merit dispatch as per the Government directive.

Per unit cost of power from UJVNL

The cost of power from UJVNL stations has been another major issue of contention.

In FY 2003-04, UPCL was purchasing power from UJVNL at a rate of 55 paise/unit and paying a royalty of 5.5 paise/unit taking the total to 60.5 paise per unit. This was based on the tentative price determined by the State Government in its order dated 22nd February 2002. In this order, it was stated that the Commission would review this tentative price subsequently. However, neither UPCL nor UJVNL approached the Commission to review the cost. The Commission was against

this adhoc rate fixed by the Government and stated that there existed an earlier PPA between UP Jal Vidyut Nigam and UPPCL (signed on 18th December, 2000), which laid out the methodology for cost of power purchase from UJVNL. This PPA was to remain in force after the separation of Uttaranchal. The Commission, therefore, found the rate of 60.5 paise per unit without any basis and fixed the power purchase cost at 37 paise per unit (which was prevailing in undivided UP in 2001-02). In addition, the Commission asked UPCL to work out an updated cost of power purchase, which the Commission would then scrutinize.

The Commission also advised the Government to impose a power development cess of about 33 paise unit on generation (to promote hydel development in the state). Along with a royalty charge fixed by government at 10 paise, the cost of power purchase from UJVNL came to 80 paise per unit (37 paise cost of power purchase +33 paise development cess+10 paise royalty charge). In the FY 2005-06 order, UERC utilized tariffs for CGS as those fixed by CERC. In case of UJVNL, the Commission considered tariffs for nine UJVNL stations as per tariffs determined by itself (the tariff for main generating stations of UJVNL was 38.69 paise per unit). The Commission took the tariff of UREDA and other stations on the basis of the proposed estimates as their tariff were not determined by the Commission. It however urged UPCL and UREDA to file its ARR to UERC for these plants as well.

Table 9.28 gives the cost of power purchase from each source.

Table 9.28 Cost of power purchase (Rs Crore)

Cost of Power Purchase	FY 2003-04 (Approved)	FY 2004-05** (Proposed)	FY 2005-06 (Approved)*
Small hydro			13.4
UJVNL main station	239	205.9	234.71
NHPC	34.95	34.53	35.37
NTPC	82.93	245.93	220.55
NPC		20.51	12.43
Total CGS	117.88	300.97	268.35
IPPs		6.71	
Transmission charges	14.15	24.84	19.29
Total power purchase cost	370.68	544.45*	535.75

*The total contains an additional 6 MU (1.72 MU of Tanakpur free power and 4.31 MU of UI charges which has not been shown in the table)

** Figures for FY 2004-05 are those proposed by UPCL for 2004-05 (given in tariff order FY 2005-06) while those for FY 2003-04 and FY 2005-06 are approved figures

SOURCE Tariff order for UPCL FY 2003-04 & FY 2005-06

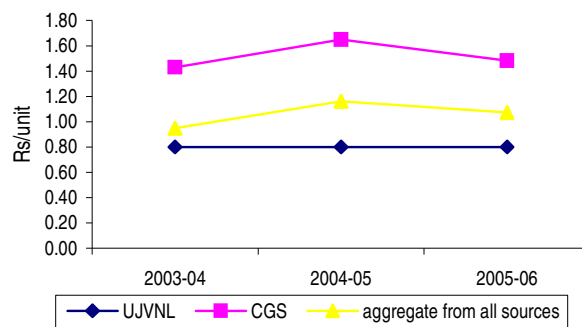
Table 9.29 gives the per unit cost of power purchase.

Table 9.29 Per unit cost of power (Rs/kWh)

Source	FY 2003-04	FY 2004-05	FY 2005-06
UJVNL main station	0.80	0.80	0.80
CGS	1.43	1.65	1.48
Total power purchase cost	0.95	1.16	1.07

SOURCE UPCL tariff order FY 2003-04 and FY 2005-06

The per unit cost of power purchase has risen from Rs 0.95 per unit in FY 2003-04 to Rs 1.07 per unit in FY 2005-06. This difference is primarily on account of increased cost of power purchase from central generating stations as the cost of purchase from UJVNL has remained constant at Rs 0.80 per unit.

**Figure 9.8** Per unit cost of power from FY 2003-04 to FY 2005-06

SOURCE TERI estimates based on total power purchase cost and power purchase quantum given in UPCL tariff order FY 2003-04 and FY 2005-06

Table 9.30 and Figure 9.9 give the cost of power purchase as % of ARR.

Table 9.30 Cost of power purchase as % of ARR

	Total power purchase cost (Rs Crore)	Total ARR (Approved) (Rs Crore)	Power purchase as % of total cost (%)
FY 2003-04	370.68	702.92	52.73
FY 2004-05	503.38	643.61	78.21
FY 2005-06	535.75	756.61	70.81

(based on approved figures)

SOURCE Tariff order for UPCL FY 2003-04 & FY 2005-06

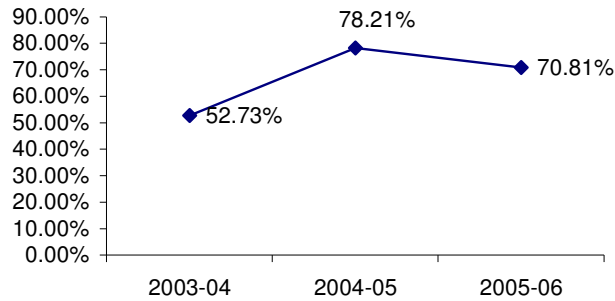


Figure 9.9 Power purchase as % of ARR

SOURCE TERI estimates based on ARR figures from tariff order for UPCL FY 2003-04 & FY 2005-06

As can be seen from Figure 9.9, cost of power purchase as a proportion of total ARR has risen steeply. This is primarily on account of power purchase from the central generating stations. The quantum of power purchase from CGS has more than doubled from 872 MU in FY 2003-04 to 1809 MU in FY 2005-06. At the same time, per unit cost of power purchase from GCS has increased from Rs 1.43 in FY 2003-04 to Rs 1.48 in FY 2005-06. As a result the total cost of purchase from CGS has increased from Rs 117.887 crore to Rs 268.35 crore in FY 2005-06.

Fuel surcharge

The Commission did not allow for any pass-through in tariffs on account of fuel price adjustment. It argued that UPCL had earned substantial surplus revenue. It also argued that the effect on tariffs on account of fuel price adjustment would be very minimal as most of the power comes from hydel sources within the state and only the power from thermal central generating stations would be affected.

Unscheduled interchange charges¹

Table 9.31 gives the details of UI charges and quantum of UI transaction during FY 2003-04, FY 2004-05 and FY 2005-06.

¹ based on the information provided by UERC

Table 9.31 Unscheduled interchange charges

UI Charges	FY 2003-04	FY 2004-05	FY 2005-06
Units injected (LU)	4825.1	3938.43	2884.1
Units drawn (LU)	190.34	353.9	349.86
Amount received (Rs Crore)	55.92	93.62	79.59
Amount to be paid (Rs Crore)	3.27	13.45	9.05
Net amount to be received (Rs Crore)	52.65	80.17	70.55
Average recovery rate for energy injected (Rs/kwh)	1.16	2.38	2.76
Average rate for energy drawn (Rs/Kwh)	1.72	3.8	2.59

SOURCE Data provided by the UERC

Operating expenses

Employee cost

Table 9.32 gives the proposed, approved and actual employee cost from FY 2003-04 to FY 2005-06.

Table 9.32 Employee Cost (Rs Crore)

Employee cost *	Proposed	Approved	Actual
FY 2003-04	164.49	108.22	93.1
FY 2004-05	117.72	106.12	NA
FY 2005-06**	106.26	93.74	102.41

* net of capitalized expense

** for both UPCL and PTCUL

SOURCE: Tariff order for FY 2003-04 and FY 2005-06, audited accounts for FY 2003-04 and tariff proposal for UPCL and PTCUL for FY 2006-07 (for actuals)

In FY 2003-04, the Commission allowed a much lower employee cost than what was proposed by UPCL. The Commission stated that UPCL had projected its expenses by increasing the employee strength by 506 posts. This was not allowed, as UPCL did not provide information on recruitment against these posts.

The Commission approved employee cost for FY 2004-05 based on a scrutiny of the Monthly Trial Balance (MTB) and pay bills of UPCL and PTCUL.

In FY 2005-06, UPCL proposed an increase in employee cost on the basis of a revised basic salary and DA. The Commission argued that the attrition during this time has been more than the induction of new employees and therefore this increase in salary would be made up by the reduction in employees.

Employee productivity

Table 9.33 gives the trend in employee productivity from FY 2003-04 to FY 2005-06.

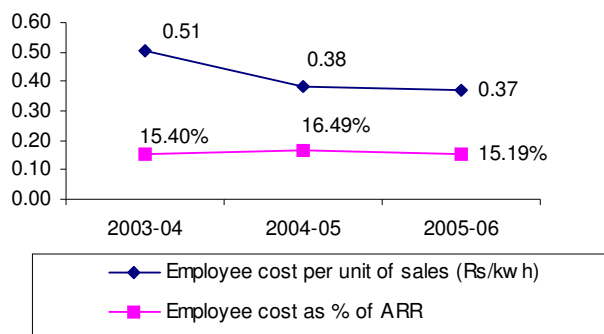
Table 9.33 Employee productivity

Parameter	FY 2003-04	FY 2004-05	FY 2005-06
Employee cost per unit of sales (Rs/kwh)	0.51	0.38	0.37
Employee cost as % of ARR	15.40%	16.49%	15.19%

Based on costs approved by Commission

SOURCE TERI estimates

The employee cost per unit of sales has come down from Rs 0.51 per unit in FY 2003-04 to Rs 0.37 per unit in FY 2005-06. This indicates that employee productivity has increased. However employee cost as a percentage of total ARR has increased in FY 2004-05 and then declined in FY 2005-06. Figure 9.10 gives a graphical representation of the movement in employee productivity.

**Figure 9.10** Trend in Employee productivity

SOURCE TERI estimates

Repair and Maintenance expenses (R&M expenses)

Table 9.34 gives the R&M expenses for FY 2003-04, FY 2004-05 & FY 2005-06.

Table 9.34 R&M expenses (Rs Crore)

R&M expenses	Proposed	Approved	Actuals
FY 2003-04	37.72	17.18	29.67
FY 2004-05**	34.33	30.53	NA
FY 2005-06**	35.63	35.63	51.03

** Aggregate R&M for UPCL and PTCUL

SOURCE Tariff order for FY 2003-04 and FY 2005-06, audited accounts for FY 2003-04 and tariff proposal for UPCL and PTCUL for FY 2006-07 (for actuals)

In FY 2003-04, the Commission initially approved R&M expenses based on the GFA of Rs 1058.18 Crore at the rate of 1.5% of opening balance of GFA for transmission works and 2.5% of opening balance of GFA for distribution works. In the supplementary order, the Commission reviewed its R&M estimates. The revised value of GFA as on April 1, 2003 was Rs 1147.16 Crore and accordingly the total R&M worked out to Rs

25.24 Crore (Rs 5.16 Crore for transmission and Rs 20.08 Crore for distribution).

For FY 2004-05, UPCL claimed Rs 34.33 Crore (aggregate for UPCL and PTCUL). The Commission accepted Rs 30.53 based on its own scrutiny. In FY 2005-06, the Commission approved the proposed R&M estimate of Rs 35.63 Crore. It should be noted that R&M expenses (as approved by the Commission) have grown at approximately 15-20% in these years. Figure 9.11 (A) gives the trend in R&M expenses.

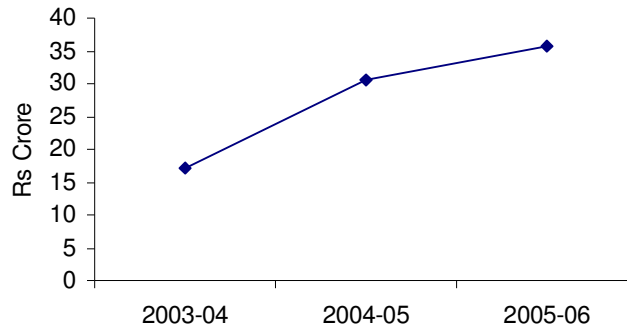


Figure 9.11 (A) Trend in R&M expenses (based on approved figures)
SOURCE Tariff order for UPCL FY 2003-04 & FY 2005-06

Figure 9.11 (B) gives R&M as a percentage of opening level of GFA (approved) for FY 2003-04, FY 2004-05 and FY 2005-06.

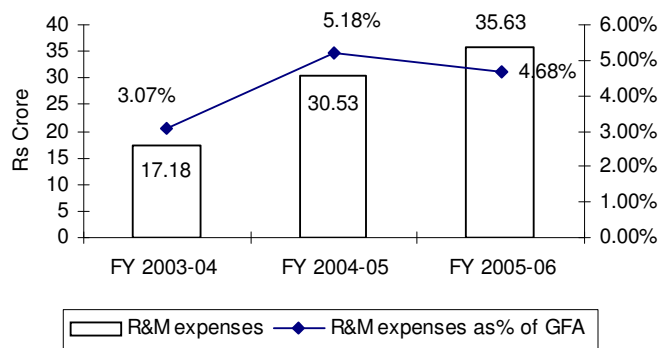


Figure 9.11 (B) R&M expenses (based on approved figures) as percentage of GFA
SOURCE Tariff order for UPCL FY 2003-04 & FY 2005-06

Interest costs

For FY 2003-04, UPCL proposed interest liabilities as given in Table 9.35.

Table 9.35 Interest Cost

Component	Proposed
Interest on liabilities arising out of transfer scheme	50.37
Interest on fresh loans from FI	13.07
Interest on loan from past CPSU liabilities	49.94
Interest due on loans from govt of Uttaranchal	19.29
Total	132.67

SOURCE Tariff order for Uttaranchal FY 2003-04 & FY2005-06

In the FY 2003-04 order, the Commission did not allow most of these loan liabilities. The Commission argued that during the time of the tariff determination for FY 2003-04, the transfer scheme was still being negotiated; and therefore the interest costs on this account could not be taken as an expense for that year. Further, bonds had been issued for CPSU dues under a Tripartite Agreement between GOI, GoU and the RBI and it was not clear at that time whether the Government of Uttaranchal or UPCL would serve the interest liability. Therefore this cost was not allowed in FY 2003-04. The amount claimed by UPCL as fresh loans from FI's was not considered as UPCL did not get them scrutinized by the UERC. Similarly the loans from Government of Uttaranchal were also not allowed as the UPCL did not get it scrutinized by UERC. In all, the Commission approved Rs 5.5 Crore as interest payment. This was allowed for interest liability under the APDRP and PMGY schemes.

However in the supplementary order of FY 2003-04, the Commission agreed to look into the new investments based on information available on planned projects from the State Government. Apart from Rs 150 Crore loans availed till November 2001 by UPCL, the utility also projected borrowing of another Rs 156.7 Crore for FY 2003-04. Accordingly the total liability worked out to Rs 307 Crore and the interest worked out to Rs 22.74 Core.

Table 9.36 gives the interest cost for FY 2003-04.

Table 9.36 Interest cost: FY 2003-04 (Rs Crore)

FY 2003-04	Proposed	Approved in tariff order 2003-04	Approved in Supplementary order FY 2003-04	Actual
Interest costs	132.67	9.01	22.74	162.5

SOURCE Tariff order for Uttaranchal FY 2003-04 & FY2005-06, Supplementary order for 2003-04 and audited accounts for FY 2003-04.

The interest charges for FY 2004-05 were approved at Rs 26.73 Crore as against Rs 115.71 Crore proposed by UPCL. These are

interest charges net of capitalization. Table 9.37 gives the details.

Table 9.37 Interest charges for FY 2004-05 (Rs Crore)

Proposed	Approved	Actual
115.71	26.73	NA

SOURCE Tariff order UPCL for FY 2005-06

For FY 2005-06, the Commission allowed interest payment towards GoU loan as Rs 28.38 against the Rs 31.69 Crore proposed. Amongst the interest due as per the transfer scheme, the Commission allowed Rs 11.85 Crore as REC loan payment as proposed. The Commission did not approve Rs 10.17 Crore that UPCL proposed as interest towards GPF dues as these had been taken over by UP Government. Similarly, it did not allow interest of Rs 48.62 Crore claimed as interest on CPSU dues. These have been taken over by GoU. Overall in FY 2005-06, the UERC allowed interest expenditure of Rs 48.8 Crore against Rs 127.22 Crore proposed by UPCL as given in the Table 9.38.

Table 9.38 Interest expenditure in FY 2005-06¹

Loan (Rs Crore)	FY 2005-06		
	Proposed	Approved	Actual
Government of Uttaranchal loan	31.68	28.38	-
Transfer Scheme loans	101.84	Nil	-
Total*	127.22	48.48	60.56

*Interest net of capitalization

SOURCE Tariff order for Uttaranchal FY 2005-06 and ARR& Tariff proposal of UPCL and PTCUL for FY 2006-07 (for actuals)

Administrative & General expenses (A&G expenses)

For FY 2003-04, UPCL proposed a 10% increase over the FY 2002-03. The Commission considered this to be very high and allowed for an increase of only 3% over the previous years. In FY 2004-05, UPCL proposed Rs 17.75 Crore while the Commission allowed Rs 13.11 Crore. In FY 2005-06, UPCL again proposed a 10% hike over the base year (FY 2004-05). The Commission allowed only a 4% increase. The details of the A&G expenses (proposed, approved and actual) are given in Table 9.39.

¹ These include interest expenditure of both UPCL and PTCUL since at that time apportionment of loans between UPCL and PTCUL had still not been done.

Table 9.39 Administrative and General Expenses (Rs Crore)

A & G Expenses	Proposed	Approved	Actuals
FY 2003-04	16.08	10.84	59.8
FY 2004-05	17.75	13.11	
FY 2005-06*	18.3	13.15	20.8

**Aggregate for UPCL and PTCUL

SOURCE Tariff order for UPCL for FY 2003-04 & FY 2005-06, audited accounts for of UPCL for FY 2003-04 and ARR and Tariff proposal for UPCL and PTCUL for FY 2006-07 (for actuals)

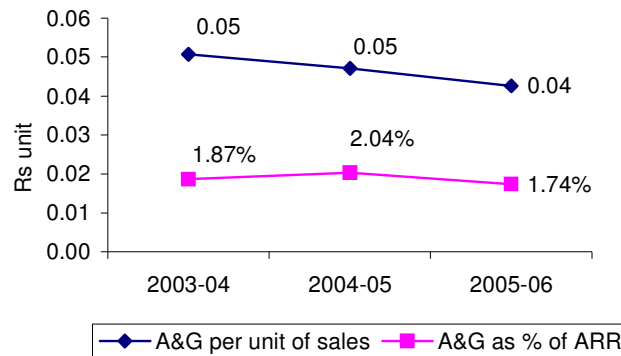
Table 9.40 gives the A&G per unit of sales and A&G expenses as a percentage of ARR.

Table 9.40 Efficiency improvement in A&G

Particulars	FY 2003-04	FY 2004-05	FY 2005-06
	Approved	Approved	Approved
A&G per unit of sales (Rs/unit)	0.05	0.05	0.04
A&G as % of ARR	1.61%	2.04%	1.74%

Based on approved figures

SOURCE TERI estimates

**Figure 9.12** A&G expenses (approved) per unit of sales and as % of ARR

SOURCE TERI estimates

Taking into account the approved figures, it is seen the A&G expenses per unit of sales and A&G expenses as percentage of ARR came down. The actuals for A&G expenses were however higher than approved figures. In FY 2003-04, the actual A&G expense was Rs 59.8 Crore which was higher than both proposed and approved figures (actual is per the audited figures for FY 2003-04). The actual A&G expenses for FY 2005-06 were also higher, though, marginally from the proposed and approved figure.

Depreciation

In FY 2003-04, UPCL claimed expenditure of Rs 83.7 Crore towards depreciation for FY 2003-04. This was based on an average rate of 7.87% on the gross block for FY 2003-04. UPCL assumed GFA of Rs 1063.3 Crore. The Commission argued that the GFA figure was very high mainly on account of assuming value of fixed assets transferred from UPPCL to UPCL at Rs 817.6 Crore instead of Rs 478.86 Crore as per UPCL's provisional account for FY 2001-02. This transfer scheme was still being negotiated between the two Governments (UP and Uttaranchal) and therefore the higher value of assets could not be considered. The Commission approved Rs 507.34 Crore only as opening value of GFA for FY 2003-04 (based on UPCL's balance sheet for 2001-02). UERC approved Rs 39.93 Crore as depreciation at the rate of 7.87 %.

Subsequently, in the supplementary order the Commission allowed for Rs 90.41 crore. This was based on a GFA of Rs 1065 crore at 8.77%. This is discussed in greater detail in the annex at the end of the chapter. The actuals for FY 2003-04 have been taken from the audited accounts of UPCL. Table 9.41 gives the details of depreciation for FY 2003-04.

Table 9.41 Depreciation (FY2003-04)

	Proposed	Approved in tariff order	Approved in Supplementary order	Actuals
GFA (Rs Crore)	1063.3	507.34	1065	1162.88
Deprecation as % of GFA	7.87 %	7.87%	7.87 5	7.88
Deprecation (Rs Crore)	83.7	39.93	90.41	91.64

SOURCE Tariff order FY 2003-04, supplementary order for UPCL for FY 2003-04 & audited accounts of UPCL for FY 2003-04.

While the aggregate depreciation for UPCL and PTCUL was claimed at Rs 100.35 Crore, the Commission approved only Rs 31.16 Crore. Table 9.42 gives a comparison of proposed and approved depreciation.

Table 9.42 Depreciation for FY 2004-05 (Rs Crore)

FY 2004-05	Proposed	Approved
UPCL	82.8	23.72
PTCUL	17.55	7.44
Total	100.35	31.16

SOURCE Tariff order FY 2005-06

For FY 2005-06, UPCL claimed Rs 98.77 Crore as depreciation and PTCUL claimed Rs 24.74 Crore. UPCL calculated its depreciation on a total value of fixed asset of Rs 1209.04 Crore. It followed depreciation norms under the rates prescribed by MoP in 1994 under Electricity (Supply) Act, 1948. The Commission argued that the E(S) Act, 1948 has been repealed and approved the depreciation amount based on the norms

fixed by CERC. The Commission approved Rs 31.6 Crore as depreciation for UPCL for FY 2005-06. Similarly, PTCUL claimed depreciation Rs 24.74 Crore as per the earlier MoP guidelines. The Commission arrived at only 8.66 Crore. The Commission allowed an aggregate depreciation amount of Rs 40.26 Crore for UPCL and PTCUL. Table 9.43 gives the depreciation details for FY 2005-06

Table 9.43 Depreciation for FY 2005-06 (Rs Crore)

	Proposed	Approved	Actual
UPCL	98.77	31.6	61.7
PTCUL	24.74	8.66	7.99
Total	123.51	40.26	69.72

SOURCE Tariff order FY 2005-06& ARR and tariff proposal of UPCL and PTCUL for FY 2006-07 (for actuals)

Sources of funds

Sources of finance for proposed capital expenditure

Table 9.44 gives an account of funds released for new projects during FY 2002-03 and FY 2003-04.

Table 9.44 Details of funds for UPCL¹ (Rs Crore)

Details of scheme	FY 2002-03			FY 2003-04		
	Budget provision	Release Grant Loan		Budget provision	Release Grant Loan	
District plan	25.7		1.5	40		
State plan	25.7		1.5	0		
					0.81	
					0.58	
PTW energisation	3.25	3.25		3.25	1.86	
			2.93			
PMGY (RE)	2	13.75	0.9		3.6	0.45
			20			
			13			
MNP (RE)	75		37	35		
		13.5	1			4.5
		3.15	0.85			
APDRP	81.33	73.02	8.11	233	67.5	3
NABARD				40		
REC	25		27.88	25		
Total	237.98	106.67	114.67	376.25	74.35	7.95

SOURCE Supplementary order for UPCL for FY 2003-04

Utilization of funds under APDRP

Uttaranchal has taken substantial funds for T&D up gradation under APDRP and has utilized around 87% of funds under the programme. The details are given in the Table 9.45.

Table 9.45 Utilization of funds under APDRP

¹ As per information from State Government (given in the supplementary order of December 2003)

APDRP Fund utilization (Rs Crore)	Funds received	Expenditure
FY 2002-03	99.63	7.09
FY 2003-04	75	23.83
FY 2004-05	66.13	73.41
FY 2005-06	42.9	144.1
Cumulative upto March 2005	283.66	248.44

SOURCE <http://www.powermin.nic.in/APDRP> status report

The details of the progress made under APDRP are given in the Table 9.46.

Table 9.46 Progress under APDRP

Rs /Crore	Project cost	Fund release	% of work completion	Total utilization upto June 2006
Rudrapur circle	101.03		0.68	65.86
Dehradun circle (U)	32.13		0.68	21.96
Roorkee circle	76.65		0.63	47.87
Srinagar EDC	54.88		0.83	45.13
Raniket	18.24		0.87	13.25
Dehradun Circle (R)	28.15		0.94	26.4
Total	310.08	279.76	0.73	220.47

SOURCE <http://www.powermin.nic.in/APDRP> status report

These schemes were approved in November 2002. As can be seen from the table, substantial amount of work has been completed under these schemes.

Power development fund

In order to promote more investment in hydel generation, the Commission advised the State Government to levy a cess on the hydel power being produced and used in the state. This cess was to be used to establish a special fund for promotion of investments in new hydro generation units.

Accordingly, the Commission included a charge of 43 paise per unit over and above the adhoc provisional purchase rate of 37 paise/unit for power purchase from UJVNL.

Provision for bad and doubtful debt

In the tariff order for FY 2003-04, the petitioner had claimed Rs. 32.76 Crore as provision for bad and doubtful debt. However, UERC did not allow any expense under this head. UERC argued that UPCL did not have any policy for identifying such debts and for writing it off. It asked UPCL to formulate a clear and transparent policy for identifying and writing off bad and doubtful debts. UPCL however, did not take any action on this. The actual amount under bad and doubtful debt is stated as Rs 37.96 Crore in the audited accounts of UPCL for FY 2003-04.

In the ARR petition for FY 2004-05 and FY 2005-06, UPCL claimed expenditure of Rs 13.36 Crore towards provision for bad and doubtful debts for FY 2004-05 and another Rs 20.51 Crore for FY 2005-06.

Under the Transfer scheme, a provision to the tune of Rs 230.01 Crore was made for writing off bad and doubtful debts. This amount increased to Rs 278 Crore as on March 31, 2003. The total outstanding dues of UPCL on 31st October 2004 were Rs 1037 Crore of which Rs 569 Crore were of private consumers and Rs 468 Crore from government department. The Commission argued that government department dues cannot be considered bad and doubtful and therefore the existing provision of Rs 278 Crore was to be utilized for writing off such debts out of non-government dues of Rs 569 Crore. This amount of Rs 278 Crore would amount to 49% of the total outstanding, which the UERC argued, was adequate. The Commission, therefore, did not allow for any provision for bad debt either in FY 2003-04 order or the FY 2005-06 order. The details are given in the Table 9.47.

Table 9.47 Provision for bad and doubtful debt

	FY 2003-04	FY 2004-05	FY 2005-06
Proposed	32.76	13.36	20.51
Approved	Nil	Nil	Nil
Actual	37.96	NA	18.6

SOURCE: Tariff order for FY 2003-04 and FY 2005-06, audited accounts for FY 2003-04 and tariff proposal for UPCL and PTCUL for FY 2006-07 (for actuals)

Rate of return

For FY 2003-04, UPCL proposed Rs 16.63 Crore as Return on Capital Base of Rs 67.66 Crore. UERC assessed Capital Base at Rs 8.8 crore for FY 2003-04. At a rate of return of 16%, it allowed Rs 1.41 Crore as return. Further, as per UERC, the return of 0.5% on loans from the Government and other approved sources worked out to Rs 1.35 Crore. UERC allowed an aggregate Rs 2.77 Crore as reasonable return in FY 2003-04.

In the supplementary order, the Commission determined a negative capital base of (-) 114.09 Crore. As per the UERC, UPCL was not entitled to any return on asset as it had a negative base. UPCL, however, was entitled to a 0.5% return on loans from the Government and other approved sources. This worked out to Rs 3.78 Crore. The details are given in the Table 9.48.

Table 9.48 Return on capital base for FY 2003-04

Rs Crore	Proposed	Approved	Approved (Supplementary order)
On capital base	10.84	1.41	Nil
0.5% of borrowings from organizations or institutions approved by state government	5.79	1.36	3.78
Reasonable return	16.63	2.77	3.78

SOURCE Tariff order for Uttaranchal FY 2003-04, FY 2005-06 and supplementary order 2005-06.

For FY 2005-06, UPCL proposed Rs 6.29 Crore and PTCUL proposed Rs 1.9 Crore as return. For both UPCL and PTCUL, the Commission ruled that the utilities have not invested any of their funds/reserves for meeting any capital expenditure. Assets have been financed totally out of grants and loans. It, therefore, did not allow any return to UPCL and PTCUL. The proposed and approved return for FY2005-06 is given in Table 9.49.

Table 9.49 Rate of Return for FY 2005-06 (Rs Crore)

Licensee	Proposed	Approved	Actual
UPCL	6.29	Nil	0.7 ¹
PTCUL	1.9	Nil	Nil
Total	8.19	Nil	0.7

SOURCE Tariff order for FY 2003-04 and FY 2005-06, audited accounts for FY 2003-04 and tariff proposal for UPCL and PTCUL for FY 2006-07 (for actuals)

Annual Revenue Requirement (ARR)

The movement in total ARR is given in Table 9.50 and Figure 9.13.

Table 9.50 Trend in Annual Revenue Requirement (Rs Crore)

	FY 2003-04	FY 2004-05	FY 2005-06**
ARR (Proposed)	794.05	890.37	1032.18
ARR (Approved)	702.92	643.61	756.61
ARR (Actual)	1016.12	NA	988.77

** Aggregate of UPCL and PTCUL

SOURCE Tariff order for FY 2003-04 and FY 2005-06, audited accounts for FY 2003-04 and tariff proposal for UPCL and PTCUL for FY 2006-07

¹ Return on equity

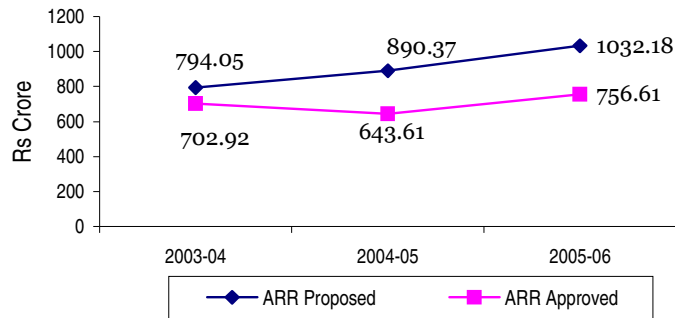


Figure 9.13 ARR (proposed and approved)

SOURCE Tariff order for UPCL for FY 2003-04 & FY 2005-06

The supplementary order in December 2003 estimated the average revenue requirement at Rs 811.98 Crore. However this increased ARR did not have a bearing on the tariffs determined for FY 2003-04 as this was only an exercise undertaken as per the directive of the High Court. It is to be noted that there is a substantial difference in the proposed and approved ARR for FY 2005-06 mainly on account of difference in the proposed and approved expenses for depreciation and interest charges. The detailed break up of the ARR proposed, approved and actual for FY 2004-05 is given in Table 9.51.

Table 9.51 ARR break-up of FY 2003-04 (Rs Crore)

Details	FY 2003-04		
	Proposed	Approved	Actual
Power Purchase Expenses	389.8	370.68	585.5
Employee cost	164.49	108.22	93.1
A&G expenses	16.08	10.84	59.8
R&M expenses	37.42	17.18	29.6
Interest Charges	133.34	9.01	162.52
Provision for bad & doubtful debt	32.76	0	37.9
Depreciation	83.7	39.93	91.6
Interest on working capital	-	6.24	-
rebate allowed to consumers	15.4	-	-
Less expense capitalised	48.17	-	-
Reasonable returns	16.63	2.77	NA
Total Expenses	841.45	564.88	1060.2
Provision for contingency reserve	-	188.77	-
Total expenses after provision	841.45	753.65	1060.2
Less non tariff income	49.7	50.73	44.1
Net Aggregate Revenue Requirement	793.75	702.92	1016.1

SOURCE Tariff order for FY 2003-04 and audited accounts of UPCL for FY 2003-04

Table 9.52 gives the detailed ARR for FY 2004-05 and FY 2005-06 (proposed and approved)¹.

Table 9.52 Detailed ARR for FY 2004-05 & FY 2005-06

Particulars	FY 2004-05		FY 2005-06		
	Total claimed by PTCUL & UPCL	Corrected by Commission for PTCUL & UPCL combined	Total Projected (PTCUL & UPCL combined)	Total Approved (PTCUL & UPCL combined)	Actuals ² (PTCUL & UPCL)
Power Purchase Expenses	541.4	503.38	615.13	535.75	625.7
Transmission Charges	35	23.99	45.69	30.77	56.06
Employee cost	117.72	106.12	130.3	114.95	125.27
A&G expenses	17.75	13.11	19.52	13.15	22.8
R&M expenses	34.33	30.53	35.63	35.63	51.03
Interest Charges	120.61	31.6	133.51	54.77	76.69
Depreciation	100.35	31.16	123.51	40.27	69.72
Interest on working capital rebate allowed to consumers		0	0	11.92	9.18
		0	0	0	
Gross expenditure	967.16	739.89	1103.29	837.21	1036.47
Less: expense capitalization	27.86	25.73	32.2	28.89	41
Reasonable return	8.25	0	8.19	0	0.7
Provision for bad & doubtful debt	13.4	0	20.51	0	18.57
Net Expenditure	960.95	714.16	1099.79	808.32	1014.75
Provision for transitional contingency reserve			0	0	
Less: Non -Tariff income	70.48	70.55	67.61	51.71	15.98
Net Aggregate Revenue requirement (15)-(16)	890.47	643.61	1032.18	756.61	998.77

SOURCE Tariff order of UPCL for FY 2005-06 and tariff proposal for UPCL and PTCUL for FY 2006-07 (for actuals)

Tariff rate balancing

Approach to tariff determination

1 Difference between the employee cost and interest charge between this table and the analysis of the components down earlier is on account of expenses capitalised. The employee cost and the interest cost discussed earlier in details is total employee cost minus the expenses capitalised. In this table the expenses capitalised have been clubbed together

2 The actuals for FY 2006-07 are based on UPCL revised estimates based mostly on actuals for six months (April –September 2005) and projections for the remaining six months. These actuals (revised estimates have been taken from UPCL and PTCUL petition for FY 2006-07).

The Commission identified the following goals in the determination of tariffs in FY 2003-04.

- Recovery of licensee's prudent costs through determining cost of supply
- Minimising the gap between the consumer tariff and cost of supply
- Effective targeting for subsidy allocation to the lifeline categories of consumer
- Simplifying the slab structure
- Reducing Cross subsidy burden reduction for the subsidizing consumer segments
- Rationalization and simplification of the existing tariff structure
- Providing function incentives and penalties

The Commission has stated that it intends to move towards tariff reflecting the cost of supply. In the FY 2003-04 order the Commission used the average cost of supply of the utility, as the yardstick for determination of tariffs for all consumer categories.

Tariff structure

The tariff being charged in the state comprise of fixed charge and variable energy charge. For certain categories a minimum charge is also prescribed¹. Some of the other measures at rationalising tariff are:

1. In FY 2003-04, UERC did away with fixed charges for all metered consumers other than the industrial consumers². Consumers were to pay only the per unit energy charge based on the actual consumption recorded in their meters. To ensure certain minimum revenue for the utility, the consumers were required to pay a minimum charge, if the actual recorded consumption fell below a stipulated level. For industrial consumers the existing two-part tariff was continued. Fixed charges in case of industrial consumers could not be done away in the tariff order for FY 2003-04, as data was not available to assess revenues from industrial consumers.
2. In the FY 2003-04 order, the Commission merged all Government owned irrigation systems like life irrigation systems and state tube well into one category.
3. In FY 2005-06 order the Commission decided to have only two instead of earlier three categories of domestic

¹ Tariff order 2003-04

² According to the UERC, fixed charges encouraged under-reporting of load (sanctioned load reported lower than the actual load). The commission quoted the petitioner's statement that of 676293 domestic consumers, as many as 527038 claimed a sanctioned load of 1 kW only. This under-reporting leads to a mismatch between distribution network capacity and actual demand and results in frequent breakdowns in the system.

consumers (lifeline for BPL, all other domestic consumers).

Category wise average tariff

Table 9.53 gives the cost coverage for each category of consumers in FY 2003-04 and FY 2004-05. The cost coverage is arrived at by estimating the average revenue for each category as a% of average cost (average of all consumers).

Table 9.53 Average realisation for each consumer category

	FY 2003-04			FY 2005-06		
	Average revenue (AR)	Average cost (AC)	AR/AC	Average revenue (AR)	Average cost (AC)	AR/AC
Domestic	2.03	3.29	61.83%	1.93	2.45	78.78%
Commercial	3.45	3.29	104.83%	3.21	2.45	131.02%
Public Lamps	1.95	3.29	59.36%	3.39	2.45	138.37%
Private Tube Wells	0.98	3.29	29.81%	1.52	2.45	62.04%
Government Irrigation System*	3.05	3.29	92.81%	2.48	2.45	101.22%
Public Water Works	2.35	3.29	71.62%	2.25	2.45	91.84%
Industries*	2.85	3.29	86.77%	3.03	2.45	123.67%
Temporary Supply	0.63	3.29	19.18%		2.45	0.00%
Bulk	2.23	3.29	67.90%	4.09	2.45	166.94%
Average tariff	2.41	3.29	73.16%	2.58	2.45	105.31%

* includes state tube well & public canals, * *includes both HT and LT industry

SOURCE TERI estimates

In 2003, the average cost coverage of the domestic consumers was around 62%, from private tube wells it was 30% but that from the Government irrigation system it was 93%. Cost recovery from commercial category was 105% which shows that this category is cross-subsidising other categories. The coverage from industrial categories was around 87%. In FY 2005-06, the cost of coverage from the commercial and industrial consumers was 131% and 124%. This shows that these categories were paying more than the average cost of supply. Domestic consumers were paying around 79% of the average cost of supply. In the agricultural category, private tubewells were paying around 62% of the average cost while the Government irrigation system was paying around 101%.

Convergence index (CI)

Figure 9.14 shows the movement in CI. The CI has declined by only 5% from FY 2003-04 to FY 2005-06.

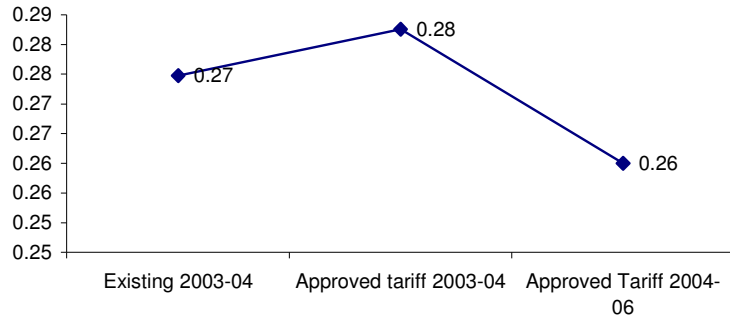


Figure 9.14 Trend in Convergence Index

SOURCE TERI estimates

Tariff rationalisation and new initiatives in tariff design

- 1. Time of Day tariffs:** The Commission introduced TOD tariffs in FY 2003-04. TOD tariffs were introduced for peak and off peak hours for HT Industrial consumers. In this, a surcharge of 25% was levied for consumption during morning peak and evening peak hours. A concession of 5% is given for off-peak hours. In FY 2005-06 ToD was further extended for all non-domestic consumers under sub-category “Hospitals/education/charitable institution” with connected loads above 4 kW or with 3-phase supply, all other non-domestic consumers above 25 kW, and all LT industrial consumers above 25 kW.
- 2. Tariff in snowbound areas:** All domestic consumers and small non-domestic consumers with load upto 1 kW in snow bound areas were exempt from payment of minimum charges. These consumers were also given tariff as under the sub-category of BPL consumers with upto 1 kW load and 30 units/month consumption¹
- 3. Lifeline tariffs** of 50 units or less per month (in order that subsidy is effectively targeting the poor) on a contracted load upto 1 kW
- 4. Concessions on tariffs:** The Commission introduced a monthly rebate of Rs 50 in the electricity bill for all consumers who have installed solar water heating system (in order to reduce peak demand during the winter months).

¹ Concession available only to villages notified as snowbound/snow line villages by the concerned District Magistrate

Transitional contingency reserve

There were uncertainties with respect to estimating value of certain cost items in the UPCL petition in FY 2003-04 on account of non-finalization of division of assets and liabilities between UPPCL and UPCL. The Commission stated that some of the claims of UPCL on investment and capitalization were not substantiated with documents. The Commission decided that it would approve these expenses (subject to prudence check) when data becomes available. However, the Commission did not want frequent changes in tariff (or tariff shocks). The Commission, therefore, made a provision of Transitional Contingency Reserve to meet the liabilities due to such uncertainties. This reserve was to be temporary for FY 2003-04 and was not to be required in subsequent years. A total sum of Rs 188.77 Crore was set aside as the Transitional Contingency Reserve for meeting unforeseen liabilities. This was to be kept in a separate account and would comprise of at least Rs 80 Crores of old arrears to be realized in the year out of past receivables and the balance of surplus of revenue over expenses allowed for FY 2003-04.

The Commission also stated that before it announced tariffs in FY 2003-04, the retail tariffs prevalent in undivided UP were being charged in Uttaranchal. The cost of power came down substantially for Uttaranchal on separation (as it got control over most hydel plants) but tariffs did not come down. This had developed considerable surplus and this could also be used to fund the Transitional Contingency Reserve. UPCL however did not create any such reserve nor did it transfer any funds to the same.

Treatment of revenue gap and subsidy

Table 9.54 gives the revenue gap/surplus status for FY 2003-04 and FY 2005-06.

Table 9.54 Revenue gap/ (surplus) at existing tariffs (Rs Crore)

Description	FY 2003-04*			FY 2005-06**	
	Proposed	Estimated by UERC	Actuals	Proposed	Estimated by UERC
Net revenue requirement	793.75	702.92	1016.12	972.24	725
Income from sales of electricity at existing tariff	655.19	758	966.6	820.37	830
Revenue gap/(surplus)	138.56	(55.08)	49.4	151.87	(104.25)

*the approved ARR for FY 2003-04 is as per the original tariff order of FY 2003-04. ¹

**figures in FY 2005-06 are of only UPCL (excluding PTCUL)

SOURCE Tariff order for UPCL for FY 2003-04 and FY 2005-06, audited accounts for FY 2003-04

¹ The revised figure given in the supplementary order were not considered while analyzing the revenue gap as the additional costs approved in the supplementary order did not have any effect on the tariffs for 2003-04.

In FY 2003-04, the Commission estimated a revenue surplus of Rs 55.08 Crore at the existing tariff. The Commission reduced overall tariffs by Rs 135 Crore (Rs 55.08 Crore which was the surplus at existing tariff and another Rs 80.03 which the UERC argued would be the excess amount that UPCL will realize from tariffs till the new tariff for FY 2003-04 come into effect.

In FY 2005-06, the Commission estimated a revenue surplus of Rs 104.25 Crore at existing tariffs (i.e. tariffs determined in the order of FY 2003-04). The Commission reduced the tariff of non-domestic category marginally and increased the tariff for domestic category. Tariffs for all other categories remained same. It estimated income from sales at the new tariffs for FY 2005-06 at Rs 820.22 Crore and therefore the net surplus at new tariffs was estimated as Rs 94.38 Crore.

Treatment of the surplus of FY 2005-06

Out of the surplus of Rs 94.38 Crore, the Commission asked UPCL to set aside Rs 5 Crore in a separate bank for meeting the directives on improvement on quality of service to consumers. The Commission directed UPCL to give Rs 127.1 Crore out of the balance surplus of Rs 89.38 Crore in FY 2005-06 and estimated surplus of Rs 615 Crore in previous year to the GPF trust of employees for UPCL and PTCUL as interest free loan as a transitional arrangement pending transfer of state's share of GPF money from UPPSEB. As per the Commission, it made this transitional arrangement to avoid any difficulty in payments to retiring employees as well as to avoid loading of any financing charges on this account on consumers pending settlement of this issue with UP.

There have been differences between UPCL and UERC on the surplus of UPCL. UPCL has refused to accept the surpluses in revenue as estimated by the Commission in the tariff order. UERC commissioned an independent investigation in 2005 to look into the matter. Table 9.55 gives the findings of investigation on surplus of UPCL.

Table 9.55 Surplus of UPCL (as per investigation) Rs crore

	FY 2001-02	FY 2002-03	FY 2003-04	*FY 2004-05	Total
Surplus determined in the investigation	69.21	329.16	249.68	107.48	755.53
Deficit/surplus shown in tariff petition of					
UPCL	-18.7	-65.98	-168	-139	-391.68
Profit/loss as reflected in UPCL accounts	-23.97	12.41	-49.45	-181.85	-242.86

SOURCE "Report on Special audit" conducted by independent Chartered Accountant appointed by UERC (available on UERC website)

The auditors stated that expenses had been overstated by the UPCL. It stated that savings in power purchase cost accruing

upto 31st March 2003 were Rs 318.22 Crore. In addition, an amount of Rs 296.01 Crore was the revenue surplus over and above the prudent expenditure during FY 2003-04 and FY 2004-05. This added upto Rs 614.23 Crore and was the major source of surplus for UPCL over the years. Table 9.56 shows where the surplus amount has been utilized by UPCL.

Table 9.56 Application of surplus

Application of surplus	Rs Crore
Excess paid to UJVNL	100.61
Increase in cash and bank balances from 09.11.01 to 31.03.05	275.35
Increase in unrealised dues from 09.11.01 to 31.03.05	379.57
Total	755.53

SOURCE "Report on Special audit" conducted by independent CA appoint UERC available on UERC website.

The Commission, on the basis of the investigation report stated that the surplus amount of Rs 755.53 Crore includes an amount of Rs 100.61 Crore paid to UJVNL by way of excess power purchase cost, which is the difference between 55 paise/unit and 37.2 paise/unit for the period 9th November 2001 to 31st March 2003 and the provisional rate of 37 paise/unit and the station wise final rate determined by the Commission and made effective from 1st April 2003.

Governance

Timeliness of tariff orders

Tariff order FY 2003-04

As per the Regulation 125 of Conduct of Business Regulations of UERC, the UPCL was to submit its ARR and tariff proposal between 15th and 30th December for the ensuing financial year.

After seeking extensions on a number of occasions, UPCL submitted its ARR petition on 14th May 2003. The Commission found some gaps and asked for a re-submission by 30th May 2003. UERC finally accepted the petition on 4th June 2003. The tariff order for FY 2003-04 was issued on 8th September 2005.

Therefore, it can be seen that though UERC was constituted in September 2002, its first tariff order for UPCL came out a year later. This tariff order determined tariffs for FY 2003-04 and was to be implemented by UPCL by 20th September 2003. UPCL, however, implemented it only in the month of December though it was effective from the prescribed date, i.e., 20th September.

Tariff order FY 2005-06

As per Section 64 of the EA 03 read with Regulation 56 of the Uttaranchal Electricity Regulatory Commission (Conduct of Business Regulation), 2004, and Regulation 5 of the Uttaranchal Electricity Regulatory Commissions (Terms and Conditions for Determination of Distribution Tariff) Regulation requires that every year the distribution licensee shall file with the Commission on or before 30th November.

The ARR and Tariff proposal for FY 2004-05 and later for FY 2005-06 kept moving back and forth between the Commission and UPCL. The Commission kept finding numerous data gaps while UPCL kept asking for more time to furnish the data.

Finally on 31st December, when the ARR for FY 2004-05 was delayed by a year and that for FY 2005-06, by a month, the Commission began suo-moto tariff determination proceedings. UPCL finally submitted ARR for both years on 15th January 2005. UERC then considered this ARR under its suo-motto proceedings. The tariff order was finally issued in April 2005. In this order, UERC scrutinized the cost elements for FY 2004-05 and determined tariffs for FY 2005-06. Table 9.57 gives a snap shot of delay in issue of orders.

Table 9.57 Timeliness of issue of Tariff order

Year	Due date for ARR	Final acceptance of petition by commission	Date of issue of tariff order	Time taken from acceptance to issuance of final order by the Commission (in days)
FY 2003-04	30 th Dec. 2002	4 th June 2003	8 th Sept. 2003	94
FY 2004-05 and FY 2005-06	30 th Nov. 2004	15 th Jan. 2005	25 th April 2005	100

SOURCE Tariff order of UPCL for FY 2003-04 & FY 2005-06

Public participation

In FY 2003-04, the Commission notified UPCL's petition in six newspapers, four of which were regional. It received a total of 135 objections. It held public hearings at four locations, namely, Rudrapur, Almora, Muni-ki-reti and Dehradun from July 22-31, 2003.

In case of the combined order for FY 2004-05 and FY 2005-06, the Commission began suo-motto proceedings for tariff determination and while doing so it invited comments from stakeholders. For this purpose a notice was given in three newspapers in January 2005 in three newspapers. On receiving the ARR and tariff proposal on 15th January 2005, it also notified this in two newspapers.

The Commission received a total of 175 objections. It held public hearings at three places namely, Haridwar, Dehradun and Haldwani from February 22 to March 5, 2005.

It has to be noted that the UERC reduced the location for hearing from 4 to 3 in its second order (FY 2005-06) and also reduced the number of newspapers in which it notified the petition from 6 to 3.

Promotion of renewable energy

Uttaranchal is trying to promote development of small –hydro in the state. It come out with specific regulations and tariff orders in order to accelerate the development of small hydro projects. The UERC has issued SHP tariff setting order, which approves a single part tariff. Under this order incentives for plants operating above the normative PLF are being offered to developers. Under UERC's incentive scheme, if a generator operators at a PLF higher than the normative PLF of 45%, he is given an additional 10% over his Annual Fixed Cost. This translates into higher revenue for the generator through an increase in tariff.

Consumer advocacy and redressal

Three member Consumer Redressal Forums have been created for Garhwal and Kumaon. Till March 2006 the Ombudsman has received 17 presentations of which 15 have been redressed.

There is no separate cell for Consumer Advocacy. UERC had recently commissioned a study to IIMC (Indian Institute of Mass Communication) to assess the level of consumer awareness on electricity and regulatory issues in the state.

Anti-theft measure

The Government of Uttaranchal (GoU) has constituted 13 Special Courts in every district for the trial of offences related to the misuse and theft of electricity. GoU has also designated Executive Engineers as Assessing Officers and constituted District level Committees, as required under the Electricity Act, 2003. Table 9.58 gives details of the anti theft cases and amount recovered.

Table 9.59 Anti-theft cases and amount recovered

Anti-theft cases	No of consumers scrutinised for theft	Amount recovered (Rs lakh)	Connections disconnected	Amount pending for realization (Rs lakh)	Theft Cases registered by the police
FY 2005-06 (Dehradun & Haldwani)	2688	191.2	1078	240.2	146
FY 2006-07 (half yearly from 1/4/2006 to 30/09/2006) (Dehradun & Haldwani)	1312	34.66	169	48.84	143
FY 2006-07 (half yearly from 1/4/2006 to 30/09/2006) (Kumaon region)	443	15.84	54	8.84	21

SOURCE Information provided by UERC office, Hyderabad

In the first year of UPCL's operations, the outstanding dues against sales were Rs 629.25 Crore. This has risen by around 66% from Rs 1037 Crore in March 2005. It is to be noted that the outstanding dues have risen by a lesser amount in the later years. In March 2004 the outstanding dues amounted to Rs 1009.67 Crore and this increased by Rs 28 Crore to Rs 1037 Crore in March 2005. This shows that collections efficiency (per year) has increased. Table 9.60 gives these details.

Table 9.60 Outstanding Dues (Rs Crore)

Outstanding dues	
September-2001	629.25
March-2002	682.06
March-2003	824.78
March-2004	1009.67
March-2005	1037

SOURCE Tariff Order for UPCL for FY 2005-06

Open access

The Commission notified the regulations for open access for distribution in 2004. As per the regulation, open access is to be allowed to customers as per the following schedule

Table 9.61 Schedule for allowing open access

Phase	Capacity sought to be allocated by the Open access consumer	Date by which open access shall be allowed
Phase-1	5 MW and above	Dec. 31, 2005
Phase-2	3 MW and above	Dec. 31, 2007
Phase-3	Above 1 MW	Dec. 31, 2008

SOURCE UERC (Terms and conditions for Open access in distribution) Regulation, 2004 issued in June 2004

The Commission in its regulations stated that open access shall be allowed as per the phase given above "subject to the absence

of operational constraints and having regard to other relevant factor”.

It is also stated that it may require the distribution licensee to provide open access to consumers with capacity requirement equal to or less than 1 MW at any time after 31.12.2008 as it may consider feasible having regard to operational constraints and other factors. UERC has also not defined the charges that would be applicable for open access. The Commission states that it would determine charges for open access once it receives an application for open access. So far the Commission has not received any application seeking open access¹.

Appeals against orders

There has been a case in the Appellate Tribunal filed by Steel unit against the tariff determination of steel units by UERC under an amendment in August 2004 to the original tariff order of FY 2003-04. The Appellate Tribunal ruled in favour of the appellant, i.e. the steel units. In the order for FY 2003-04, tariffs for all categories was reduced substantially. In this tariff order, the Commission clubbed together all HT industrial consumers, i.e., small industrial consumers, heavy industrial consumers and power intensive industrial consumers like steel units. This tariff was implemented by UPCL sometime in December 2003 though w.e.f. 20th September 2003. On 31st May 2004, UPCL filed a petition seeking amendment in the industrial tariff fixed in the order dated 8th September 2003. It was pointed out by UPCL that on account of very high load factor of steel units their effective tariff was working out to be very low. In fact, it was working out to be less than even the average cost of supply and the steel units had thus become subsidized consumers.

The Commission examined the matter and passed an order on 24th August 2004. In this order, all Steel Units whether Induction/Arc furnaces or Rolling Mills, Re-Rolling Mills, Mini Steel Plants, etc. were designated as Power Intensive Industrial Units (PIUs). Such Steel Units (PIUs) were segregated from other consumers of UPCL and their tariff was determined on the marginal cost basis. Such units were put in a separate category, and their power purchase cost, was worked out separately. Further, in view of the high cost of power purchased for such units, their provisional tariff was fixed without including either the licensee's overhead charges or the cross subsidy levied on other consumers. Of these, the licensee's overheads were to be added to the final power purchase cost when determined. The Commission's above process of tariff determination was challenged before the Appellate Tribunal for Electricity. In its

¹ as on 15th December 2006

order dated 2nd May 2006, the Appellate Tribunal directed that tariff for Steel Units (PIUs) should be determined not on the basis of marginal cost of power purchased for supply to them, as has been done by the Commission, but after pooling the entire power purchase cost and working out the average cost of power purchased. Thereafter, the Commission issued the Tariff order for FY 2006-07 on basis of the directions given by the Appellate Tribunal.

Staffing

The Commission was initially set up as a single person commission. It has been expanded and now there is a Chairman, 2 Members and 1 Secretary. The staff comprises of 3 Directors, 6 deputy directors and 4 computer operators. In January 2006, the Government approved a proposal by the Commission for increasing the Commission's staff strength. The State Government has approved total staff strength of 49 employees. The Commission is however yet to begin its recruitment for new staff. The Commission has a budget requirement of approx Rs 2.5 Crore per year. It receives around Rs 2.65 Crore through licensee fee, etc.

Status of directives issued by UERC

In its order of FY 2003-04, the Commission issued a large number of directives to UPCL. Some of the more important directives were those related to the creation of a Transitional Contingency Reserve fund, reduction in employee costs, time-bound metering of un-metered consumers, meter reading, and billing and collection. Most of these were not complied with and in the order for FY 2005-06, the Commission expressed concern over non-compliance very strongly and constituted a Committee of Experts to examine the status and quality of the compliance of directives. It did not issue any fresh directives in the FY 2005-06 tariff order. The directives given in the FY 2003-04 orders for UPCL are detailed below.

Metering and energy audit

- UPCL was asked to submit a metering plan encompassing the time period and source of funding of energy meters to the Commission by 31st December 2003. UPCL was asked to prepare plan for replacement of defective meters in the urban areas and submit the same to the Commission.
- UPCL was asked to energies new connections only with meter and to complete metering of all unmetered connections and Government bodies in all areas by 31st December 2003.

- The Commission directed that all consumers covered under the HV-2 were to be provided with meters with capability to record time of the day consumption during the period specified in the rate schedule. This work was to be completed within a period of three months so as to implement the ToD tariff from 1st January 2004.
- UPCL was asked to meter data of all incoming and outgoing feeders at all 33 kV substations so as to be able to conduct energy audit
- Petitioner was to get a study done on the present system of meter reading, billing, dispatch of bills and collections of bills and the report was to be submitted to the Commission
- UPCL was asked to propose a detailed multi-year loss reduction plan to the commission by 31st December 2003.

Receivables management

At the time of segregation of Uttaranchal from Uttar Pradesh a sizeable amount of receivables was inherited. UPCL was instructed to carry out an analysis of its receivables against the sale of power and the amount outstanding against each consumer as on 31st March 2003. The Commission also asked for submission of a breakup of these receivables in disputed amounts, terminated connections etc. and of arrears against all Governmental bodies department wise. UPCL did not have a clear policy for identification and treatment of irrecoverable dues. The Commission, therefore, directed UPCL to formulate a clear and transparent policy by 31st March 2004 for identification and treatment of irrecoverable amount in their books and take steps to write them off.

Power purchase

- UPCL was directed to finalize the power purchase price for each Generating Station with UJVNL and submit the power purchase agreement for approval of the Commission by 31st December 2003.
- UPCL was asked to review the Power Purchase agreements with Central Generating and with IPPs
- UPCL was directed to submit the power purchase agreements already signed with IPPs, if any, to the Commission
- UPCL was directed to make a plan to ensure merit order purchase of electricity from all generating stations.

Compliance with the conditions of the license: The Commission asked UPCL to take action on the following

- To submit accounting statements and auditor report for financial year 2002 –03 by 30th September 2003
- Submit interim profit and loss statement for each year
- Submit the distribution code including standard of performance and code of practice on payment of bills by 30th November 2003
- Submit the distribution system planning and security standard by 30th November 2003
- Submit the procedure for complaint handling and consumer rights

Other directives

- UPCL was asked to submit a detailed strategy paper along with proper road map for bringing about efficiency in the system
- UPCL was asked to maintain division-wise data on both scheduled and unscheduled
- Interruptions and submit a report on the same along with subsequent ARR filing.
- UPCL was asked to come up with a concrete plan for reduction of technical and commercial losses over the next five years indicating milestones for critical activities, in the form of targets and their date of completion, within 3 months of issuance of the 2003-04 Order.
- UPCL was asked to work out and updated rate of power to be purchased from UJVNL and submit it to the Commission for approval by 31.12.2003. The Commission also directed UPCL to approach the Commission for approval of any new Power Purchase Agreement as per the prescribed procedure.
- UPCL was asked to submit to the Commission a monthly Status Report on the Transitional Contingency Reserve

Excerpts from report of Committee of Experts on compliance of directives:

In its report-dated 26th May2005 (tariff order FY 2006-07), the Committee has given the status and its own assessment of compliance of each direction reviewed by it. The Committee concluded that:

“..... most of the directives issued by the Commission have not been complied with. In a few cases only half-hearted action has been initiated and is therefore, not effective or supported with adequate data to quantify the action and benefits

thereof. It appears that there has been no serious effort or commitment on the part of UPCL to streamline the existing systems and procedures to improve the supply conditions or consumer services and take forward the power distribution reform process mandated even under the relevant provisions of Electricity Act, 2003.

The quality of information being submitted to the Commission leaves much to be desired. There is no mechanism in UPCL to attentively analyse and verify the information before submission to the Commission. There is also no mechanism to monitor the implementation of the directives of the Commission issued from time to time or monitor the parameters of reforms.”¹

The Commission, on its part brought this lack of compliance to the specific notice of Government Directors on Board of this Company in a meeting called for this purpose on 6th July 2006.

Monitoring mechanism²

The Commission claims that it monitors the working of the utility on the basis of the information provided to it (in the prescribed format) by the utility on the following parameters:

1. Collection efficiency
2. Loss level
3. Improvement in billing and collection arrangement
4. Quality of bills (bills to be issued on consumption basis only and not on assumed basis)
5. Power cuts (scheduled and unscheduled)
6. Number of meters installed and unmetered connections
7. Status of installation of TOD metering and meter reading by MRI.

The Commission further states that it holds hearings for the monitoring of compliance of directions. UERC also states that it has enforced penalties on the licensee in the matter of non-compliance of orders with regard to improvement in billing, collection and metering.

Regulations notified by UERC

All the regulations notified by the Commission are given in the Table 9.62.

¹ Tariff order UPCL 2006-07

² this is based on information provided by UERC

Table 9.62 Regulations notified by UERC

Regulations	Date
UERC (Terms & Condition for determination of Distribution Tariff) Regulation, 2004.	26/06/2004
UERC (Terms & Condition for determination of Hydro generation Tariff) Regulation, 2004	22/05/2004
UERC (Terms & Condition for determination of Transmission Tariff) Regulation, 2004.	9/10/04
UERC (Terms & Condition for Open Access in Distribution) Regulation, 2004.	19/06/2004
UERC (Conduct of Business) Regulation, 2004.	30/10/2004
UERC (Appointment & functioning of Ombudsman) Regulation, 2004.	22/05/2004
UERC (Guidelines for Establishment of Forum for Redressal of Grievances of the Consumers) Regulation, 2004.	13/03/2004
UERC (State Advisory Committee) Regulation, 2004.	30/10/2004
UERC(Fee & Fines) Regulation, 2002	4/1/03
UERC (Appointment of Consultant) Regulation, 2004.	17/04/2004

SOURCE Website of UERC – www.uerc.in

It is to be noted that the Commission has not issued regulations for Standards of Performance.

Statement of accounts

The annual accounts of UPCL for FY 2003-04, FY 2004-05 and FY 2005-06 have not been published. Only the auditors report for FY 2003-04 is available for UPCL.

Power sector rating

As per the performance rating of the state power sector carried out at the instance of Ministry of Power, Uttaranchal has received the ratings as given in Table 9.63.

Table 9.63 Rating of Uttaranchal

	FY 2004-05	FY 2005-06
Rank	21	15
Score	18.6	27.06

SOURCE "State Power Sector- Performance Rating" prepared for Ministry of Power by CRISIL-ICRA

As can be seen Uttaranchal has moved up from the 21st position in the ratings of April 2005 to the 15th position in the ratings released in June 2006. One of the areas that contributed towards this is a higher score on transmission & distribution parameter compared to the previous year.

Strengths (CRSIL-ICRA rating- June 2006)

- Consumer metering level is at 92 per cent, with a high proportion of electronic meters

- Regulator has reduced cross-subsidies across customer categories, implemented merit order despatch principles, and rationalised tariff slabs etc. in its tariff orders
- Unbundling along functional lines; including separation of trading function

Weakness (CRISIL-ICRA rating -June2006)

- Regulatory process needs to be strengthened in terms of timely filing by the utilities
- Regulatory directives relating to reduction in employee costs, time-bound metering of un-metered consumers, meter reading, and billing and collections have not been complied with
- Household electrification is low at 53 per cent
- No addition has been made to the generation capacity in the last three years

Conclusions

- The power sector of Uttaranchal has been unbundled into separate utilities for generation, transmission and distribution
- There has been very little capacity addition in the state sector.
- The Commission has taken measures to curb the over-estimation of sales for the un-metered categories by UPCL. There has been a difference to the extent of 60-65% in the sales estimates as proposed by the Commission in both FY 2003-04 and FY 2005-06 and the sales approved by the Commission.
- Connected load per consumer is considerably low in the domestic category and even shows a decline from FY 2003-04 to FY 2005-06. This could be on account of under-reporting of load by this category.
- Considerable progress has achieved in metering for commercial and domestic consumers and in case of government irrigation systems. However metering for private tube well category is still low at 33%.
- Power Purchase cost as a % of total ARR has gone up from around 52% in 2003-04 to 70% in FY 2005-06. This is on account on increase in both quantity and per unit cost of power purchase. Also the state continues to buy expensive power from CGS and uses it mainly for trading.
- The per unit cost of power purchase for the state has gone up from 0.95 per unit to Rs 1.07 per unit. The per unit cost from UJNVL stations has remained constant at around Rs. 0.8 per unit but the per unit cost from

central generating station has gone up from Rs1.43 per unit to Rs 1.48 per unit.

- Productivity of employees (in terms of employee cost per unit of sales) has improved. Employee cost has remained at a consistent proportion of total ARR at around 15%.
- A&G expenses per unit of sales have declined from Rs 0.05 to Rs 0.04 per unit of sales.
- There has been some readjustment in tariff leading to a slight reduction in the level of cross-subsidies.
- There have been substantial delays in the filing of ARRs and subsequent determination of tariffs. The Commission did bring out any tariff order for FY 2004-05.
- There are a lot of differences between the Commission and UPCL on the surpluses made by the UPCL. The cost estimates of FY 2003-04 have been re-examined by the Commission through a special audit conducting by an independent agency. In its report, the auditors have estimated an accumulated surplus of Rs 755.53 Crore from FY 2001-02 to FY 2004-05. UPCL has on the other hand claimed an accumulated deficit of Rs 391.68 in its various tariff petitions from FY 2001-02 to FY 2004-05. A major difference is on account of the reduction in cost of power (on separation from UP). The Commission states that UPCL did not get its cost and tariff scrutinized by the Commission till FY 2003-04 while the cost of power purchase went down from FY 2001-02 onwards.
- The compliance of directives has been very slow in the state. UERC set up a Committee of Experts to examine the quality and extend of compliance. The Committee of Experts has also criticized UPCL for this delay in compliance and in submitting information on status of compliance to the Commission.

Annex 9.1 Details from the supplementary order for FY 2003-04 (issued in December 2003)

UERC issued a Supplementary order on 8th December 2003. The supplementary order delved into these following issues.

- Would state government take over the interest liability of Rs 11.91 Crore
- Whether state government would provide subsidy to the petitioner to the extend of Rs 25 Crore
- Whether the state government would take over the interest liability of the petitioner to the extent of Rs 49.94 Crore on old dues payable by the petitioner to the CGS.
- Impact of the state government directive
- Whether state government will levy cess including loyalty

Response of the State Government (on issues brought out in the supplementary order)

The Government of Uttaranchal had signed a Tripartite Agreement with RBI and GoI agreeing to take over the CPSU dues. The state government issued bonds and agreed to pay the principal and interest on the dues. Thus, the liability of Rs 572 Crore of CPSU dues and the interest thereof stand shifted from UPCL to the state government.

The state government, on the other hand, also clarified that:

1. It would not take over the responsibility for payment of UP government's dues devolving on UPCL as a result of the transfer scheme
2. It would not take upon the responsibility for UPCL's share of UPPCL's dues towards employee's provident fund.
3. It would not give any subsidy to UPCL during FY 2003-04
4. It increased the royalty rates from 5.5 paise/unit to 10 paise/unit effective from September 2003
5. It was still considering the issue of imposing cess (duty)

Box 9.6 Issues arising out of the transfer scheme

The gross fixed assets as on 09.11.01 as per the Provisional Balance sheet as on 31.03.02 was Rs 478.86 Crore, the same was projected as Rs 817.6 Crore in the ARR based on the draft transfer scheme and the value of the same agreed to in the transfer agreement was Rs 1058.18 Crore. The reason for this steep increase was not made clear to the commission. (Was it due to additional asset being transferred to UPCL or was it on account of underestimation of GFA earlier on).

SOURCE Supplementary order for UPCL for FY 2003-04 issued in December 2003

Information from supplementary order

The State government policy directive had impact on three components:

- Power purchase cost
- Income from trading
- Interest on loan for new investment

Power purchase cost: The Commission had required the licensee to purchase power from small hydro stations and IPPs as per the merit order. However in October 2003, the GOU directed the Commission to take action for ensuring purchase of power from such stations, ahead of the merit order. This was done according. As per the Commission the revised power purchase was Rs 378.46 Crore as compared to the earlier approved power purchase cost of Rs 370.68 Crore.

Income from Trading: The income from trading as per the original tariff order 2003-04 was Rs 13.77 Crore. Due to government's directive, relatively costlier power produced by micro and small hydel plants which was earlier marked for trading was now to be used for supply to customers within the state and corresponding quantity of cheaper power meant for consumption within the state was available for trading purpose. As a result the trading income went up by around Rs 7.78 Crore. As a result the utility's share in this income increased from Rs 13.77 Crore to Rs 14.94 Crore.

Interest on loan for new projects: In the tariff order for FY 2003-04 the commission recognized investments pertaining to all projects taken before 31st March 2002, all projects taken up under ADPRP and PMGY and all projects having an outlay of less than Rs 2.5 Crore. For other investments, the Commission had stipulated prior scrutiny and approval before recognizing them for the purpose of taking into account interest on loans. As a result the Commission had not allowed for any interest on account of investments for any other investment besides the three stated categories above (as the utility did provide detailed information for scrutiny by the Commission). In the supplementary order, the Commission agreed to look into the new investments based on information available on planned projects from the state government. Apart from Rs 150 Crore loans availed till November 2001 by UPCL, the utility also projected borrowing of another Rs 156.7 Crore for FY 2003-04. This was taken into account in the supplementary order by the Commission. Accordingly the total liability works out to Rs 307 Crore and the interest works out to Rs 22.74 Crore. In the tariff order for FY 2003-04, UERC had allowed for interest cost of Rs

5.5 Crore and therefore the additional interest cost worked out to Rs 17.24 Crore.

Table 9.64 Impact of Government letter & affidavit

(Rs crore)			
	Approved in tariff order FY 2003-04 (dated 08.09.03)	Approved in Supplementary order FY 2003-04 (dated 08.12.03)	Impact
Power Purchase	370.68	378.46	7.78
Interest on loans	5.5	22.74	17.24
Sub-total	376.18	401.2	25.02
Trading income	13.77	14.94	1.17
Total	362.41	386.26	23.85

SOURCE Supplementary order for UPCL for FY 2003-04 issued in December 2003

Impact of transfer scheme

Value of gross fixed assets

On basis of the transfer scheme the GFA was revised to 1058.18 Crore as against Rs 817.6 Crore filed by UPCL in its ARR petition. This change in GFA necessitates revision of the depreciation amount, repair and maintenance cost and in the Capital Base of UPCL on which return is to be allowed.

Depreciation

Depreciation was calculated on a rate of 7.88% as quoted by UPCL. The commission accepted Rs 63.18 Crore as the capitalized amount. As per the supplementary order the depreciation worked out to Rs 90.41 Crore (Rs 83.4 Crore on opening value of GFA (Rs 1058.18 Crore) on 9th November 2001 at the rate of 7.88% and Rs 7.01 Crore as additions to GFA till 31st March 2003). This is as against Rs 37.69 Crore approved as depreciation in the earlier FY 2003-04 orders.

Repair and maintenance

R&M expenses for FY 2003-04 were approved based on the GFA of Rs 1058.18 Crore at the rate of 1.5% of opening balance of gross fixed assets for transmission works and 2.5% of opening balance of gross fixed assets for distribution works. GFA was distributed in the ratio of 30 % transmission assets and 70% as distribution assets (as proper classification of assets was not available). The revised value of GFA as on 1st April 2003 was Rs 1147.16 Crore and accordingly the total R&M worked out to Rs 25.24 Crore (Rs 5.16 Crore for transmission and Rs 20.08 Crore for distribution).

Capital base and reasonable returns

In the FY 2003-04 tariff order, the Commission had determined a capital base of Rs 8.8 Crore. As per the supplementary order, UPCL claimed Capital base at the end of financial year FY 2003-04 as Rs 259.06 Crore. The Commission determined a negative capital base of Rs. 114.09 Crore. As per the Commission, UPCL was not entitled to any return on asset as it had a negative base. UPCL however was entitled to a 0.5 % return on loans from the government and other approved sources. This worked out to Rs 3.78 Crore.

Interest payable

Interest on consumer deposits: UPCL had claimed Rs 1.16 Crore as interest on consumer deposits for FY 2003-04. In the Supplementary order, the Commission increased the interest payable on such deposits from 3% to 6% and the interest payable on this account was revised upwards to Rs 2.95 Crore.

Interest on GPF liabilities

The Commission provisionally accepted interest of Rs 11.44 Crore on liabilities due to employees provident fund (as claimed by UPCL).

Total interest payable

The Commission allowed for an increase of Rs 25.66 Crore in interest payment. It had already allowed Rs 3.51 Crore as interest payable in the original tariff order FY 2003-04 and with this additional Rs 25.66 Crore, the total interest payable became Rs 29.17 Crore.

Expenses capitalized

As per the agreed transfer scheme, the amount capitalized out of total expenses was Rs 42.96 Crore (against Rs 48.17 Crore) stated earlier. The Commission accepted Rs 42.06 Crore as expenses capitalized.

Table 9.65 gives the impact of the transfer scheme on some of cost elements of the UPCL for FY 2003-04.

Table 9.65 Impact of transfer scheme

Impact of transfer scheme (Rs Crore)	Approved in		Impact
	Approved in tariff order FY 2003-04 (dated 08.09.03)	Supplementary order FY 2003-04 (dated 08.12.03)	
Depreciation	39.93	90.41	50.48
Repair and maintenance	17.18	25.24	8.06
Reasonable return	2.77	3.78	1.01
Interest on loan		26.22	26.22
Interest on security deposits	3.51	2.95	-0.56
Total	63.39	148.6	85.21
Less: Revenue expenses capitalized		42.96	42.96
Total	63.39	105.64	42.25

SOURCE Supplementary order for UPCL for FY 2003-04 issued in December 2003

Table 9.66 Total impact of transfer scheme and state government directive

S.No	Total impact of Transfer scheme & government letter (Rs crore)	Impact of transfer scheme	Impact of Government letter	Total Impact
1	Depreciation	50.48		50.48
2	Repair and maintenance	8.06		8.06
3	Reasonable return	1.01		1.01
4	Interest on loan	26.22	17.24	43.46
5	Interest on security deposits	-0.56		-0.56
6	Power purchase		7.78	7.78
7	Sub-total (A)	85.21	25.02	110.23
8	Less:			0
9	Revenue expenses capitalized	42.96		42.96
10	Trading income		1.17	1.17
11	Sub-total (B)	42.96	1.17	44.13
12	Net impact (A-B)	42.25	23.85	66.1

SOURCE Supplementary order for UPCL for FY 2003-04 issued in December 2003

Treatment of additional costs

The Commission accepted an additional cost for the utility to the tune of Rs 66.10 Crore. This included additional costs accrued due to the transfer scheme (Rs 42.25 Crore) and due to government's policy directive (Rs 23.85 Crore). However, in the supplementary order, the Commission stated that since it has already provided for a contingency reserve of Rs 188.77 Crore in the earlier order, there was no need to revise the retail tariffs. Therefore the retail tariffs were maintained at the same level as were approved in the Tariff order FY 2003-04 issued in October 2003.

CHAPTER 10 West Bengal

Introduction

The West Bengal Electricity Regulatory Commission (hereinafter referred to as the WBERC or Commission) was established in 1999 under section 17 (1) of Electricity Regulatory Commissions Act (ERC Act), 1998. The WBERC was mandated to exercise powers and functions conferred under section 22(1) of the ERC Act. After the enactment of the Electricity Act 2003 (hereinafter referred to as the Act or EA 03) in June 2003, the Commission was mandated to exercise powers and functions conferred to it in section 86 of the Act.

The Commission issued its first tariff order for West Bengal State Electricity Board (WBSEB) for FY 2000-01 and FY 2001-02 (combined tariff order). This combined tariff order was issued by the Commission on 7th December 2001. Following this, the Commission issued a combined tariff order for FY 2002-03, FY 2003-04 and FY 2004-05 on 9th June 2004. Thereafter, the Commission issued tariff orders for FY 2005-06 and FY 2006-07. The Commission has issued four tariff orders till date for WBSEB.

WBSEB still operates as a vertically integrated utility and no unbundling/corporatization has taken place. The WBERC has indicated that a high level committee has been formed by Government of West Bengal to resolve the related issues and advice for early implementation of the same. According to the Commission, in the assembly on 4th December 2006, the Minister in Charge of Power has already given a statement explaining the industry structure and other restructuring matters to be followed in the restructuring process that is to be completed soon.

Demand supply gap

Power supply position in the state indicates both energy and peak deficits. Table 10.1 and 10.2 below give the energy and peak situation in the state from FY 2001-02 to FY 2005-06.

Table 10.1 Energy availability/requirement

Year	Requirement	Availability	Surplus/Deficit	
	MU	MU	MU	%
2001-02	20670	20575	-95	-0.5%
2002-03	20551	20249	-302	-1.5%
2003-04	22091	21608	-483	-2.2%
2004-05	23155	22789	-366	-1.6%
2005-06	24936	24509	-427	-1.7%

Source: www.cea.nic.in accessed during December 2006

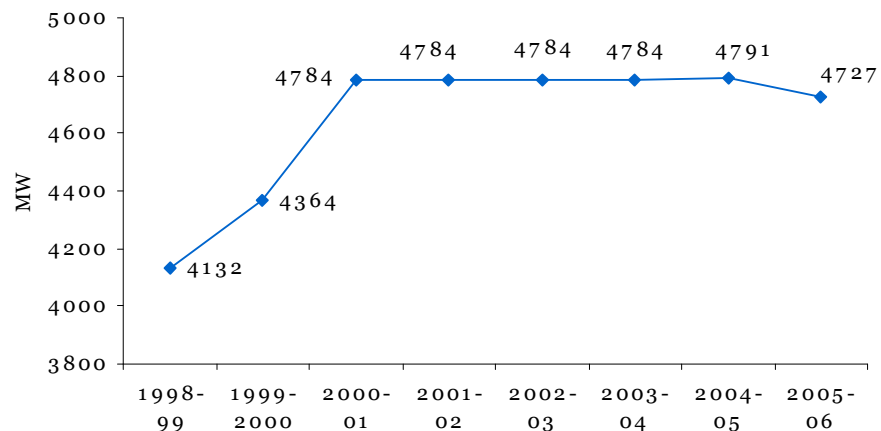
Table 10.2 Peak demand/ peak met

Year	Peak Demand	Peak Met	Surplus/ Deficit	
	MW	MW	MW	%
2001-02	3614	3414	-200	-5.5%
2002-03	3752	3418	-334	-8.9%
2003-04	3836	3652	-184	-4.8%
2004-05	4117	3965	-152	-3.7%
2005-06	4743	4599	-144	-3.0%

Source: www.cea.nic.in accessed during December 2006

Movement in installed capacity

Figure 10.1 highlights the installed capacity in the state over the years and Table 10.3 indicates the capacity addition over the years.

**Figure 10.1** Installed capacity in West Bengal over the years

Source: www.cea.nic.in accessed during December 2006

The installed capacity of power in West Bengal was 4364 MW in FY 1999-2000. Thereafter, from FY 2000-01 to FY 2003-04, the installed capacity in the state was 4784 MW and this marginally increased to 4791 MW in FY 2004-05. Installed capacity for thermal plants was 4505.38 MW for the four year period from

FY 2000-01 to FY 2003-04 which increased to 4518.58 MW in FY 2004-05; for hydropower plants, the installed capacity remained constant at 164.71 MW during the five year period from FY 2000-01 to FY 2004-05 and the installed capacity of gas based plants has remained constant at 100 MW throughout the entire period from FY 1998-99 to FY 2005-06. There was an addition of 59.12 MW in the installed capacity of other power plants, increasing their total capacity to 66.65 MW in FY 2005-06.

Table 10.3 gives the source-wise capacity addition over the years.

Table 10.3 Capacity addition over the years

Sources	FY 1998-99	FY 1999-00	FY 2000-01	FY 2001-02	FY 2002-03	FY 2003-04	FY 2004-05	FY 2005-06
Thermal	250	210	420	0	0	0	12.2	-120
Hydro	15	22.5	0	0	0	0	0	-3.01
Gas	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	-5.67	59.12
Total	265	232.5	420	0	0	0	6.53	-63.89

Source: Eastern Region Power Sector Profile, Ministry of Power, October 2006

There has not been much change in trend of installed capacity by ownership. In case of state sector, the installed capacity was 3582.77 MW, which remained the same for four years upto FY 2003-04. Thereafter, the capacity increased marginally to 3582.87 MW in FY 2004-05 and further to 3638.46 MW in FY 2005-06. In case of the private sector, the capacity of 1201.52 MW remained constant from FY 1998-99 to FY 2003-04. In FY 2004-05, the installed capacity in the private sector increased to 1207.95 MW.

The share of the central sector in the total installed capacity reduced from 2013 MW in FY 2000-01 to 684.06 MW in FY 2005-06.

This section of the report analyses the tariff order issued by the WBERC for WBSEB for FY 2003-04, FY 2004-05 and FY 2005-06. The parameters are discussed under 4 broad heads viz. consumption and access, efficiency improvement, tariffs rebalancing and governance.

FY 2002-03 in Retrospect

For FY 2002-03, the annual accounts of WBSEB give total income of Rs.2711.93 Crore on account of revenue from sale of power, revenue from subsidies and grants and other income. The accounts further indicate total expenditure of Rs.3231.62 Crore during the same year. The net loss before tax during FY 2002-03 was Rs.519.69 Crore and the net loss after tax, taking

into account the prior period credit charges was Rs.395.60 Crore. The Net Deficit in FY 2002-03 was Rs.915.29 Crore.

Consumption and access

Sales/demand estimation

The WBSEB projected the energy sale in FY 2002-03 and FY 2003-04 for the various categories of HV and EHV consumers on the basis of actual billing data for six months ending September 2002 and extrapolated the same to get the consumption figures for the two financial years. Figures for L&MV (Low and Medium Voltage) consumers were estimated on sample energy bill data and extrapolated at the historic annual growth rate of consumption.

The Commission in its order for FY 2003-04 indicated that although the methodology that was adopted by the Board for sales estimation was not a very scientific method, but on account of large number of un-metered supplies and defective meters in the system, the Commission had no choice but to accept the category-wise energy sales projected by WBSEB. The Commission directed the board to stop un-metered supply altogether and bring down supply through defective meters to the barest minimum.

In FY 2004-05, WBSEB estimated their energy sales as 10589 MU with an average growth rate of 6% over that projected for FY 2003-04, even though there was still a large quantity of un-metered supply and supply through defective meters. The Board had also projected the amount of export of power outside the region through the Power Trading Corporation, to the tune of 2600 MU. In the absence of sufficient reliable data, the Commission decided to rely on the data submitted by WBSEB. However, the Commission also assessed the energy available for sales and approved an amount of 9294 MU towards energy sales for FY 2004-05.

In FY 2005-06, the Board forecasted that the consumers in L&MV categories would need 5936 MU, while its HV&EHV consumers would need 4015 MU, thereby yielding a total of 9951 MU of demand. In addition, the Board had forecasted the energy requirement for trading and export to outside region at 3734 MU. The grand total of energy requirement for FY 2005-06 was thus projected by the Board as 13685 MU. The Commission assessed the energy available for sale in the state and after adjustment of export, bulk supply, T&D loss as well as in-house consumption, treated the balance amount as normative sale. The Commission approved a normative sale of 11844.62 MU for FY 2005-06.

Table 10.4 gives the proposed, actual and approved figures for sales from FY 2000-01 to FY 2005-06.

Table 10.4 Proposed, Approved and Actual Sales from FY 2000-01 to FY 2005-06 (in MU)

	Proposed	Approved	Actual
FY 2000-01	8497	9923	8587
FY 2001-02	9196	10748	9484
FY 2002-03	9840	9840	9425
FY 2003-04	10550	10550	12900
FY 2004-05	10589	9294	13549
FY 2005-06	9951	11845	14727

Source: Tariff Orders from FY 2000-01 to 2005-06, Annual Audited accounts of WBSEB for FY 2003-04 and FY 2004-05 and Provisional Account of WBSEB for FY 2005-06

There are two observations that can be drawn from the above table. Firstly, the actual sales have improved by about 72% in the past six years. Secondly, as can also be inferred from the figure below, although the Board's projection of total sales in FY 2000-01 was close to the actual sales, thereafter, from FY 2001-02 onwards, the proposed sales by the Board has been considerably divergent from the actual sales.

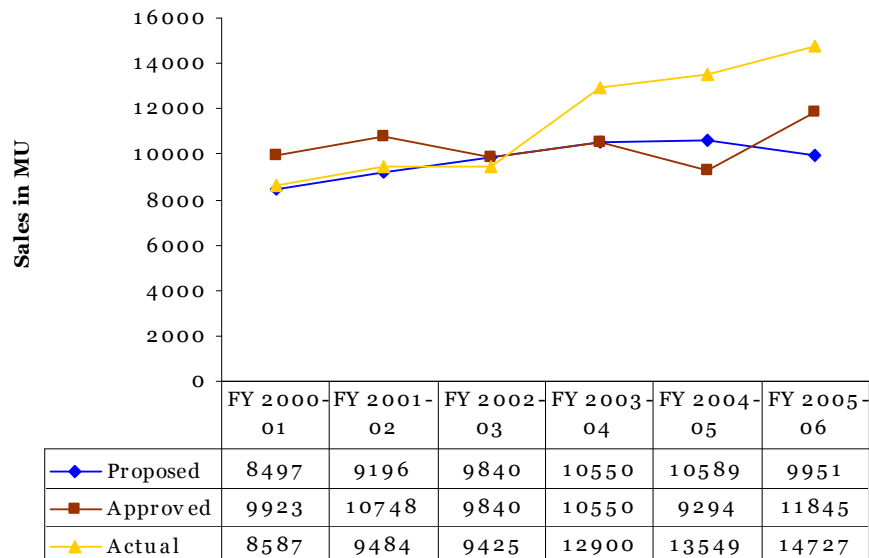


Figure 10.2 Trend in proposed, approved and actual sales (in MU)

Source: Tariff Orders from FY 2000-01 to 2005-06, Annual Audited accounts of WBSEB for FY 2003-04 and FY 2004-05 and Provisional Account of WBSEB for FY 2005-06

Sales in West Bengal have shown an increasing trend over the years. Figure 10.3 shows the movement in consumer category-wise sales from FY 2003-04 to FY 2005-06.

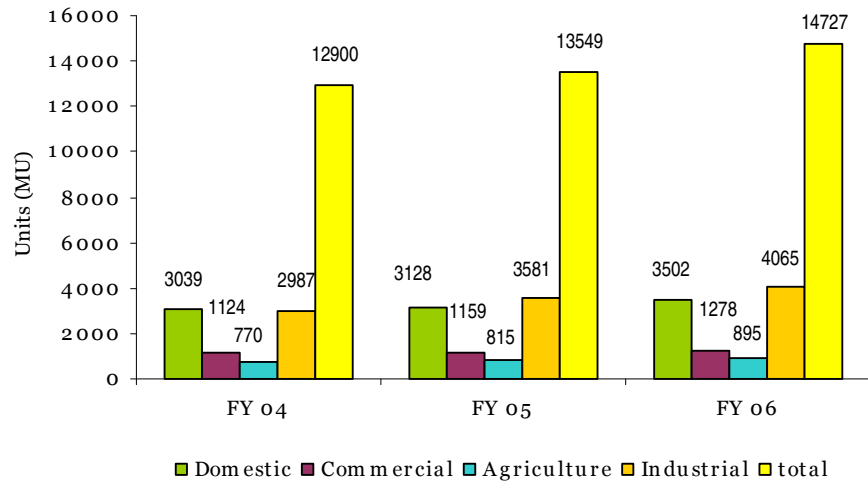


Figure 10.3 Trend in consumer category wise sales (in MU) in West Bengal over the years (actual data)

Source: Annual audited accounts of WBSEB for FY 2003-04 and 2004-05 and provisional accounts for FY 2005-06

A comprehensive study on long term demand forecasting has been conducted by a Committee constituted by the state government for the purpose of power perspective plan for the state of West Bengal. It is yet to be published by the State Government.

Category wise sales

Sales to all consumer categories have shown an increasing trend in the state over the last six years, .i.e. from FY 2000-01 onwards. The major increase has been in the domestic and H&EHV (which includes railway traction and bulk supply) consumer category. Sales to Industrial, Commercial and Irrigation categories of consumers, has only marginally increased over the years. The graph below shows the movement of sales in major consumer categories over the years.

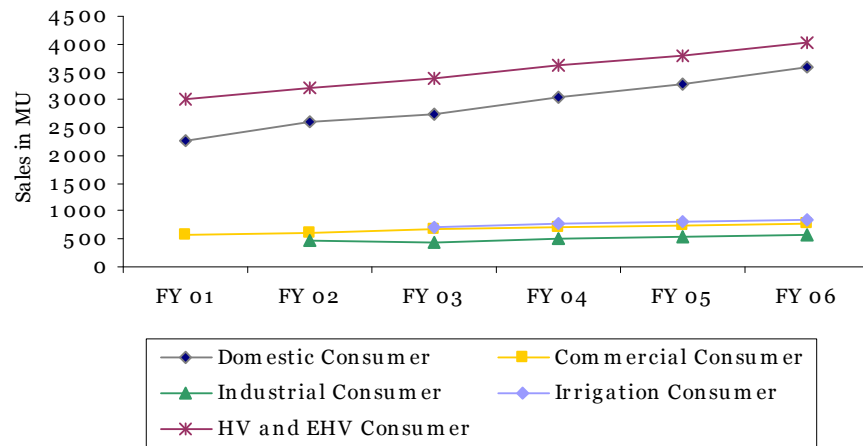


Figure 10.4 Category wise movement in sales

Source: Tariff petition of WBSEB for FY 2005-06

Table 10.5 gives the CAGR of sales for the different categories of consumers.

Table 10.5: Compounded Annual Growth Rate of category-wise sales

Consumer Category	Base Year	CAGR
Domestic Consumer	2000-01	9.6%
Commercial Consumer	2000-01	6.3%
Industrial Consumer	2001-02	4.8%
Irrigation Consumer	2002-03	5.5%
HV and EHV Consumer	2000-01	5.8%

Source: Annual Accounts of WBSEB for FY 2003-04, 2004-05 and 2005-06

The Commission in its tariff order for FY 2003-04, approved the sales as proposed by the Board on account of large number of un-metered supplies and defective meters in the system.

In the tariff order for FY 2004-05, the Commission on assessing the energy available for sale in the state, approved total sales less than that proposed by the Board. However, the detailed reasons for this have not been provided in the tariff order.

In the tariff order for FY 2005-06, the Commission assessed the energy available for sale in the state and after adjustment of export, bulk supply, T&D loss as well as in-house consumption, treated the balance amount as the normative sale. Table 10.6 explains the proposed and the approved Energy Balance for FY 2005-06 which indicates the adjustment of export, bulk supply, T&D loss as well as in-house consumption by the Commission while arriving at the normative sales approved for the year. The detailed consumer category-wise sales proposed by the Board

for FY 2005-06 and approved by the Commission has not been given in the tariff order for FY 2005-06.

Table 10.6 Proposed and approved Energy Balance for FY 2005-06

S. No.	Particulars	Proposed	Approved
SOURCES		MU	MU
i)	Own Generation	581.50	581.50
ii)	Auxiliary Consumption	3.50	3.50
iii)	Sent out Generation	578	578
iv)	Purchase	18758	18758
	Total Available Energy	19336	19336
UTILIZATION:			
i)	Export: (a) Sikkim	17	17
	(b) Others	2687	2687
	Sub-Total	2704	2704
ii)	Trading: (a) CESC	890	830
	(b) Singur – Haripal	140	140
	Sub-Total	1030	970
iii)	Transmission loss on Trading		46.75
iv)	T&D loss on sale of power to own consumers and in-house consumption	5617	3747.67
v)	Own in-house consumption	34	23
vi)	Normative Sales	9951	11844.62
	Total	19336	19336.04

Source: Tariff Order for WBSEB for FY 2005-06

Number of consumers and connected load

The number of consumers of the Board has increased from 31.41 lakhs in FY 1999-2000 to 57.96 lakhs in FY 2005-06. This indicates an improvement of 84.5% of the Board's coverage in the past seven years. Figure 10.5 indicates the growth in number of consumers over the years.

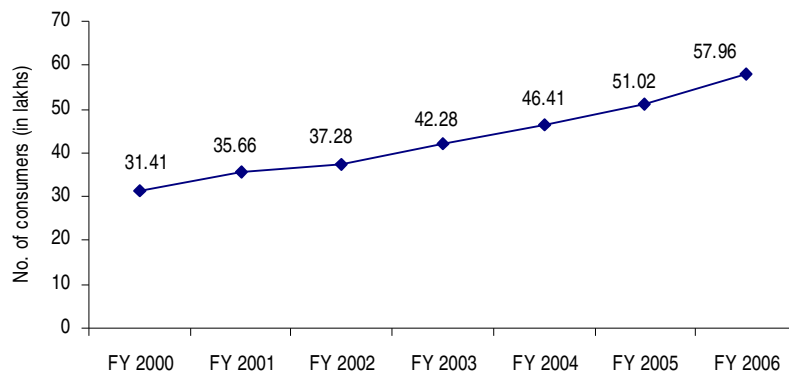


Figure 10.5 No. of consumers over the years (in lakhs)

Source: Annual Accounts of WBSEB for FY 2003-04, 2004-05 and 2005-06

Category-wise analysis indicates that domestic consumers constitute 86% of the total consumer base followed by 11% in case of Commercial. This is illustrated in figure 10.6.

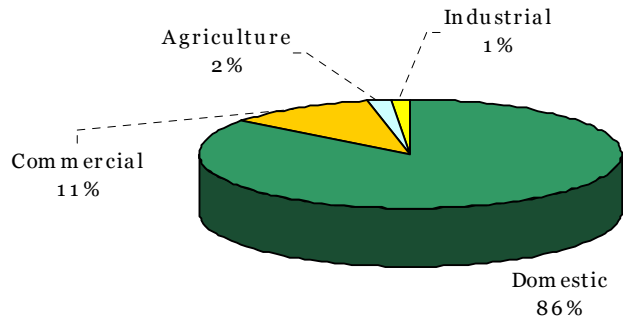


Figure 10.6 Consumer mix in the state (FY 2005-06)

Source: Written information provided by WBSERC

The total connected load in FY 2005-06 was 9066.26 MW. Figure 10.7 shows the category-wise break-up of the connected load in FY 2005-06.

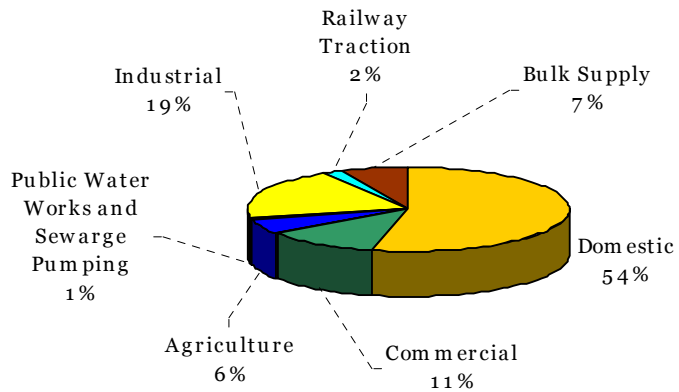


Figure 10.7 Break-up of the connected load (2005-06)

Source: Written information provided by WBSERC in December 2006

Observations

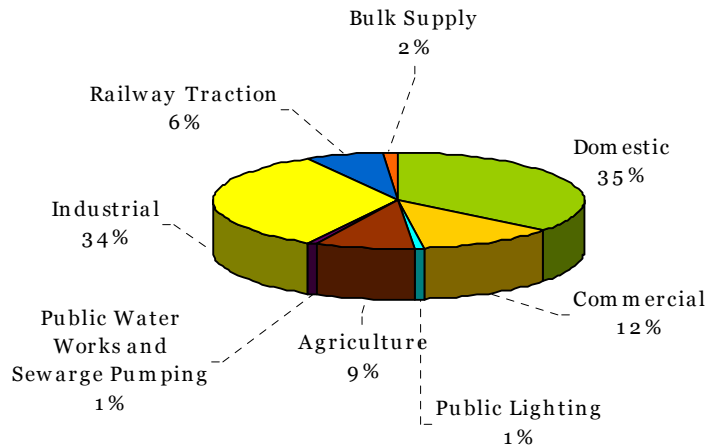
Table 10.7 indicates the sales and revenue contribution of various consumer categories in FY 2005-06.

Table 10.7 Sales and revenue contribution of various categories in FY 2005-06 (based on actual figures)

Category	No. of consumers	% of total consumers	Consumption	% of total consumption	Revenue	% of total revenue
	Nos. (in '000)	%	MU	%	Rs. Crore	%
Domestic	3937	84.8%	3533.2	35.5%	934.53	24.2%
Commercial	534	11.5%	1192.74	12.0%	568.36	14.7%
Public Lighting		0.0%	84	0.8%	15.64	0.4%
Agriculture	103	2.2%	852	8.6%	134.26	3.5%
Public Water Works and Sewerage Pumping	3	0.1%	89	0.9%	48.65	1.3%
Industrial	66	1.4%	3353.31	33.7%	1632.85	42.3%
Railway Traction	0.019	0.0%	638.35	6.4%	261.76	6.8%
Bulk Supply	0.005	0.0%	149.4	1.5%	240.83	6.2%
Outside Supplies	0.001	0.0%			24.49	0.6%
Total	4641	100	9951	100	3861.37	100

Source: Provisional accounts of WBSEB for FY 2005-06

As seen from the above, while domestic consumers constitute 85% of the total consumer base accounting for 36% of the total sales, their contribution towards the total revenue is only 24%. On the other hand, industrial consumers, which constitute only 1.4% of the total consumer base, account for 34% of the consumed energy and 42% towards the total revenue. This is further elaborated in the following pie charts.

**Figure 10.8** Category-wise consumption pattern in FY 2005-06

Source: Annual Accounts of WSBEB (provisional) for FY 2005-06

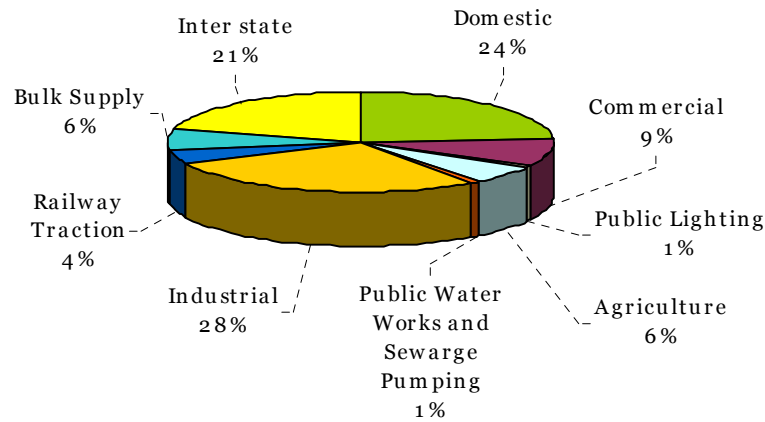


Figure 10.9 Category-wise revenue in FY 2005-06

Source: Annual Accounts of WSBE (provisional) for FY 2005-06

Based on the above, the average consumption per consumer for various categories is indicated in Table 10.8.

Table 10.8 Average consumption per consumer (based on actuals of FY 2005-06)

Consumer Category	Average consumption (Units per consumer)
Domestic	890
Commercial	2395
Agriculture	8699
Public Water Works and Sewerage Pumping	44554
Industrial	61258
Total	117796

Source: Annual Accounts of WSBE (provisional) for FY 2005-06

From the above it is evident that the average consumption per consumer per day is considerably low. For instance, in case of domestic consumers the average consumption per day works out to be 2.44 units, which is very less.

Table 10.9 indicates the number of consumers and the connected load per consumer for various consumer categories in FY 2005-06. The domestic consumers have the lowest connected load per consumer while the connected load per consumer is highest in industrial category.

Table 10.9 Connected load per consumer in FY 2005-06

Per consumer load (kW/ consumer)	No. of consumers	Connected load (MW)	Connected load per consumer (kW)
Domestic	4861283	4851.34	0.99
Commercial	650237	1036.95	1.59
Public Lighting		26	
Irrigation and Dewatering	106954	521	4.87
Public Water Works and Sewerage Pumping	3680	79.6	21.63
Industrial	73009	1738.67	23.81
Total	5695858	9066.26	1.59

Source: Written information provided by WBERC in December 2006

Status of rural electrification

Under the Rajiv Gandhi Grameen Vidhyutikaran Yojana (RGGVY) launched by Ministry of Power in April 2005, an amount of Rs.385.04 Crore has been sanctioned to West Bengal. The scheme covers 18 districts. Table 10.10 highlights the status of rural household electrification in West Bengal.

Table 10.10 Rural household electrification

Total number of rural Households	Households having Electricity	% Electrified Households	Unelectrified Households	% Unelectrified Households
11,161,870	2,262,517	20.3%	8,899,353	79.7%

Source: Ministry of Power website (www.powermin.nic.in) accessed on 6th December 2006

As far as village electrification is concerned, 20% (7694 out of 38470) villages still remain to be electrified in West Bengal. Under the RGGVY, WBSEB has a tentative target of electrifying 413 villages in FY 2006-07.¹

In line with the National Electricity Policy, WBSEB has undertaken a massive programme for electrification of un-electrified mouzas (villages) as well as extending intensified work in the electrified mouza. The position and status of rural electrification work being undertaken is summarized in Table 10.11:

¹ Source: Ministry of Power website accessed on December 6, 2006
<http://www.powermin.nic.in/bharatnirman/progress%20on%20electrification%20of%20villages%20&%20households.pdf>

Table 10.11 Status of WBSEB programme for electrification of un-electrified mouzas

1.	a)	Total Mouza proposed to be covered under AREP	4394	Nos.
	b)	Balance under execution by WBREDC, WBSEB & WBREDA schemes	1273	Nos.
2.		Already sanctioned under AREP	4283	Nos.
3.		Break-up of Sanctioned Mouzas :		
	a)	Bankura & West Midnapore (other than Kharagpur I & II Block) will be executed by PGCIL	2327	Nos.
	b)	Purulia District will be executed by NHPC	467	Nos.
	c)	East Midnapore will be executed by DVC	807	Nos.
	d)	West Midnapore District (Kharagpur I & II Block) will be executed by NTPC	225	Nos.
	e)	Work to be executed by WBSEB	457	Nos.

Source: WBSEB Tariff Petition for FY 2005-06

Efficiency improvement

Approach for fixing loss reduction targets

For FY 2002-03, WBSEB projected a T&D loss level of 34% of total energy. The Commission had fixed the T&D loss level at 30% for FY 2000-2001 (excluding bulk supply to licensees) with a direction to reduce the same by 2.5% every year for the next 4 years. The Board had submitted that the target of loss reduction as stipulated by the Commission was very difficult to achieve and based on an in-house energy audit, WBSEB had worked out the system loss level for FY 1999-2000 to be of the order of 39.2% of the energy input. The Commission decided to follow the directions of the Supreme Court (in the judgement and order dated 3rd October 2002 in case of WBERC vs. CESC) as follows-

Quote

To take a view that the utility has to share a portion of T&D loss. While the technical part of the T&D loss is very difficult to eliminate, and while reduction in the same is usually a matter of high to very high investments, it is the commercial part of the T&D loss that should receive immediate and urgent attention, for this part is capable of being reduced significantly though admittedly over a period of time, and it is this part of the loss that should not be passed on to the consumer in full.

Unquote

The Commission approved an overall T&D loss of 27.5% for FY 2002-03 (which included T&D loss actually incurred on bulk supply) and directed WBSEB to maintain this loss level for the next year and indicated that this should be reduced by 2.5% for FY2004-05. It was further highlighted by WBERC that in case satisfactory actions were not taken by the Board, the target for reduction would be 2.5% for FY 2005-06 also.

In FY 2003-04, WBSEB indicated that it had started taking steps to facilitate accurate estimation of technical and commercial losses and action had been initiated to ensure billing of the consumers and stoppage of theft of energy. However the Board could reduce T&D loss only to 32% in FY 2003-04. The Commission indicated that the same rate of reduction of 2.5% that had been stipulated in FY 2002-03 would also be application in 2003-04. The overall T&D loss approved for FY 2003-04 was 24.5%.

In FY 2004-05, the Board further submitted that although action had been initiated to ensure billing of consumers and stoppage of theft of energy, T&D loss could only be reduced to 30.2% in 2004-05. The Commission approved a T&D loss level of 25% for FY 2004-05.

In FY 2005-06, WBSEB computed the revenue requirement for the year by considering AT&C loss of 36%, but the average cost of supply was worked out considering T&D loss of 25% as approved by the Commission for the year 2004-05. The Board worked out unaccounted energy to the extent of 2289 MU and proposed to the Commission to deduct an amount of Rs. 445.60 Crore from its revenue requirement towards cost of such unaccounted power. WBSEB has undertaken a number of measures towards reducing its high rate of T&D loss such as implementing High voltage Distribution Supply (H.V.D.S.) system primarily for power supply to irrigation / agriculture consumers directly from distribution sub-station through drawal of L.T. P.V.C. cable, Geographical Information System (G.I.S.) has been taken up and 100% metering scheme has been taken up and completed metering at such station upto 11 KV feeder.

The Commission on reviewing the performance of WBSEB during FY 2005-06 approved a T&D loss level of 24% on power requirement for in-house consumption, a transmission loss of 4% in case of bulk supply to CESC Limited and Singur Haripal Rural Electric Cooperative Limited and the balance power (after adjustment of export, bulk supply and T&D loss) was to be treated as normative sale. Hence, computing the average cost of supply on the basis of normative sales will not require adjusting the revenue requirement towards unaccounted power.

Table 10.12 gives the year wise comparison of the approved total energy losses.

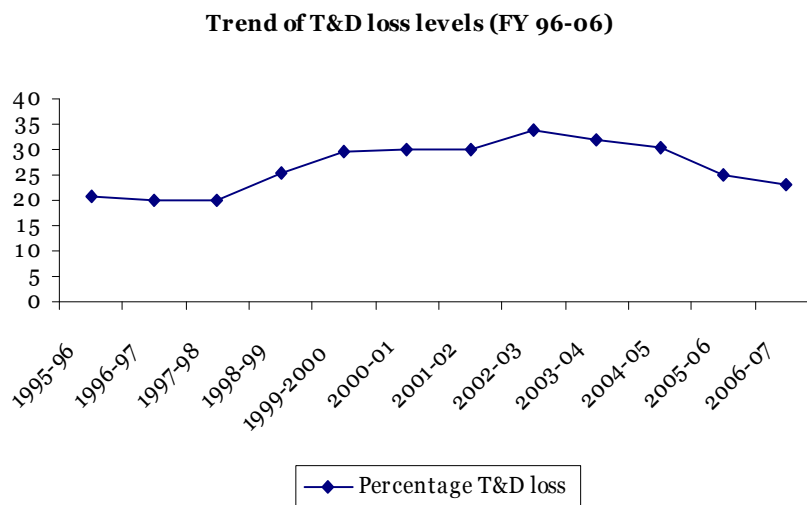
Table 10.12 Year-wise comparison of proposed and approved total energy losses

Particulars (in MU)	FY 2003-04		FY 2004-05		FY 2005-06	
	Proposed	Approved	Proposed	Approved	Proposed	Approved
Net Generation	550	550	547.25	547.25	578	578
Power Purchase	-	17969	17087	17257	18758	18758
Total Available Energy	-	18519	17634.25	17804.3	19336	19336
Less: Trading including						
Export	-	2959	2600	3905	2687	3674
Net Available Energy	-	15560	15034.25	13899.3	15602	15662
Transmission loss on trading	-	-	-	-	-	46.75
T&D loss on Sale of power to own consumers and in-house consumption	-	-	-	-	-	3747.67
Own consumption	-	22	30	23	34	23
Overall T&D loss	4701	3896	4582	3474.81	5614	3794
Overall T&D loss (%)	32	25	30.2	25	25*	24
Unaccounted Energy	-	1092	-	1107	-	-
Projected Sale	10550	10550	10589	9294	9951	11845

* ARR has been computed by WBSEB after taking into account 36% as AT&C losses

Source: WBSEB Tariff Petition for FY 2003-04 to 2005-06 and WBERC Tariff Orders for WBSEB for FY 2003-04 to 2005-06

The losses increased at a CAGR of 7.70% during the 5 year period FY 1996-97 to FY 2000-01 and at (-) 5.18% from FY 2000-01 to FY 2006-07. The figure below shows the T&D losses in West Bengal from FY 1996-97 to 1999-2000 as per the SEB Report 2002 and from FY 2000-01 to FY 2006-07 as approved by the Commission.

**Figure 10.10** Trend of T&D loss levels (FY 96-06)

Source: Tariff orders for FY 2002-03 to FY 2005-06
SEB Report 2002, Planning Commission

Table 10.13 gives a comparative view of the loss approved by the WBERC in its first tariff order (for FY 2000-01), vis-à-vis the approved loss in subsequent tariff orders.

Table 10.13 Multi-year T&D loss reduction targets

Year	% loss level (WBERC approved in FY 2000-01)	Expected % loss level (proposed by WBSEB)	Approved in tariff orders
FY 2000-01	30%	38%	30%
FY 2001-02	27.5%	36%	27.5%
FY 2002-03	25%	34%	27.5%
FY 2003-04	22.5%	32%	25%
FY 2004-05	20%	30.20%	25%
FY 2005-06	-	25%*	24%**
FY 2006-07	-	23%	23%

*Only average cost of supply has been worked out considering T&D loss of 25%. ARR for 2005-06 has been computed by WBSEB considering AT&C loss of 36%

**T&D loss level for WBSEB's own consumers and in-house consumption

Source: Tariff Orders issued by WBERC for WBSEB from FY 2000-01 to 2006-07

The Commission in its first tariff order for WBSEB in FY 2000-01 had allowed T&D loss at 30% excluding energy supplied to Bulk licensees keeping in view the audited figures in the CAG report with a clear direction to reduce the T&D loss at least by 2.5% every year over the next 4 years. WBERC had also indicated that if WBSEB was able to reduce the T&D loss more than this, then they would be given suitable incentive which may be equal to 40% of the cost of energy saved beyond the above permissible figures. In FY 2005-06, the Commission on reviewing the actions already taken and proposed to be taken by the Board towards reducing T&D losses, approved T&D loss level of 24% on WBSEB's own consumers and in-house consumption, 4% transmission loss and no T&D loss on export quantity. The Commission further directed WBSEB to attend to all the requirements of upgradation of the network and metering with topmost urgency.

Collection efficiency

To enhance collection efficiency, the following measures have been initiated by DISCOMS in West Bengal

- *Action taken against theft control*
Power theft vigilance raids by different DISCOMS have resulted in registering of 1552 theft cases and 566 cases that have been convicted in FY 2005-06. Discoms have also introduced innovative measures of tracking power theft through 'toll free phone facility'. This facility provides free phone service to electricity consumers to inform the utility about power theft.
- *Consumer Indexing*

Consumer indexing has been started in West Bengal. Consumer indexing captures all users of electricity and connects them upto distribution transformers and feeder level. This helps in identification of overloading of equipments, non billed consumers and helps in better load management, better maintenance of equipments, better billing and revenue collection. The process results in reduction of technical as well as commercial loss and improves quality & reliability of power supply.

- *Computerized Billing*

To overcome human errors, WBSEB has introduced computerised billing. They have also introduced online bill payment system and an interactive website for enabling of billing information by consumers.

AT&C losses

In FY 2002-03, FY 2003-04 and FY 2004-05, the Commission had asked the Board to submit realistic assessment of T&D losses and AT&C losses for next 5 years along with the reasons for increase in such losses despite heavy investments being made in capital assets to control such losses. WBSEB gave their assessment for the projected T&D loss for 5 years, but contended that although the loss showed a downward trend, it would still be higher than the target fixed by the Commission. The Board justified the high AT&C losses on account of disproportionate higher sale to medium and low voltage category of consumers and inadequate infrastructure.

In FY 2005-06, the Board submitted certain measures that it is undertaking to contain AT&C losses. These as indicated by WBSEB are summarized below.

- i. 100% metering scheme has been taken up and completed metering at such station upto 11 KV feeder.
- ii. The activities of Security and Loss Prevention Wing (S&LP) have been strengthened and decentralized upto circle level.
- iii. High voltage Distribution Supply (H.V.D.S.) system primarily for power supply to irrigation / agriculture consumers directly from distribution sub-station through drawal of L.T. P.V.C. cable has since been introduced. For this purpose distribution sub-stations are being considered of capacity 10 KVA, 11/0.4 KV for every two STW consumers.
- iv. To facilitate energy audit, mapping and documentation of entire power net works with reference to geographical location including attributes of the attached equipment in the power network, Geographical Information System (G.I.S.) has been taken up. Once this network documentation is completed the energy loss is to be computed through application software CYMDIST.

The overall AT&C losses for WBSEB from FY 2001-02 to FY 2006-07 are given in table 10.14.

Table 10.14 AT&C losses for the Discoms

DISCOM	FY 2001-02	FY 2002-03	FY 2003-04	FY 2004-05	FY 2005-06	FY 2006-07 (proposed)
WBSEB	35.30%	31.38%	41.22%	44.42%	36%	33%

Source: Tariff Orders for FY 2000-01 to FY 2005-06

Metering

In the tariff order for FY 2002-03, the Commission requested WBSEB to submit a detailed realistic plan for achieving 100% metering and the means to achieve the same. The Board had responded by indicating that they would install 100% meters on sub-station upto 11 kV level by 31st March 2003. They further submitted the plan for installation of meters for unmetered shallow tubewell (STW) between the periods 2002-03 to 2007-08 and indicated that by that time they would achieve 100% metering of STW consumers.

In the tariff order for FY 2004-05, WBSEB submitted that 100% metering at the substation and feeder level upto 11 kV had been completed by 31st March 2003 and the Board would complete 100% metering of tubewells in a phased manner.

In FY 2005-06, WBSEB submitted to the Commission, a list of measures that it was undertaking to contain the high level of AT&C losses. Among these, the Board indicated that High Voltage Distribution Supply system primarily for power supply to irrigation/ agriculture consumers directly from distribution sub-station through drawal of L.T. P.V.C. cable had been introduced. For this purpose, distribution sub-stations were being considered of capacity 10kVA, 11/0.4 kV for every two STW consumers. In the tariff order for FY 2005-06, the Commission issued a series of directives to WBSEB, particularly concerning metering indicating that the Board has to attend to all the requirements of metering with topmost urgency. The Board has yet to address the Commission's directions pertaining to metering. The detailed Commission directives are given in the sub-section on Governance.

The present status of metering in West Bengal is given in Table 10.15.

Table 10.15 Status of metering (FY 2004-05 and 2005-06)

Particulars	FY 2004-05			FY 2005-06		
	Numbers	Metered	%age	Numbers	Metered	%age
11 kV Feeders	2347	2347	100	2347	2347	100
Distribution transformer	53420	13500	25	53420	13500	25
Consumer metering (in lakhs)	47.27	45.89	97	57.31	56.70	99

Source: Website of Ministry of Power, www.powermin.nic.in accessed in December 2006

At present, all 11 kV meters in West Bengal are metered. The state has also achieved 99% consumer metering. Remote metering of HT & industrial consumers has been started in the state.

WBSEB's own generation

Figure 10.11 shows the quantum of WBSEB's own generation and power purchase in the total energy requirement of the state. As observed, the dependence on the power purchase decreased marginally from FY 2003-04 to FY 2004-05. Thereafter from FY 2004-05 to FY 2005-06, the quantum of power purchase increased by approximately 9%.

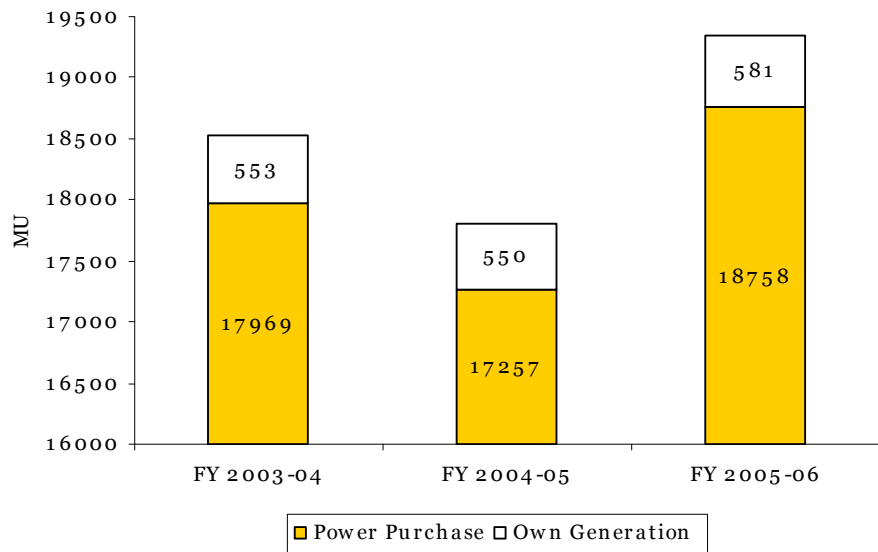


Figure 10.11 WBSEB's own generation vis-à-vis power purchase over the years

Source: Tariff Orders of FY 2003-04 to 2005-06 and tariff petitions of WBSEB

WBSEB's own generation is primarily hydro resulting in a considerably low per unit cost of generation. The main hydel stations of the Board are namely, Rammam, Jaldhaka and the Teesta Canal Fall Hydel project. While the hydropower stations of Rammam and Jaldhaka have been working consistently during the past three years at a reasonable PLF of 54% and 45% respectively, however the Teesta Canal Fall Hydel Project has been able to achieve a PLF in the range of 28-29%. The Teesta

project was designed for a peak discharge of 330 cusec. But the downstream canal system is yet to be completed, as a result of which there is no discharge outlet for the 330 cusec inflow to any other water course. The Irrigation Department in the state has restricted the water flow to a maximum of 110-130 cusec.

WBSEB has a 2x20 MW gas turbine station at Kasba, a 2x20 MW Gas Turbine Station at Haldia and a 1x20 Gas Turbine station at Siliguri. These gas turbine stations were built up in the late seventies during a severe power crisis. The gas turbine stations were operated primarily during the peak hours. Presently, these gas turbine stations are primarily operated during emergencies when the availability of power in West Bengal is abnormally low due to simultaneous outage of number of thermal units within the state.

At present, the Board maintains a diesel generating plant only at Rudranagar in Sagar Island. In view of excessive cost associated with diesel generation, the load in Rudranagar in Sagar Island is catered partly through Diesel generation and partly from Non-conventional energy sources (Solar Power).

WBSEB's own generation contributes to a very small proportion of the total energy that is available. The graph below gives the percentage contribution of the Board's own generation to the total energy availability (gross) as approved by the Commission over the years.

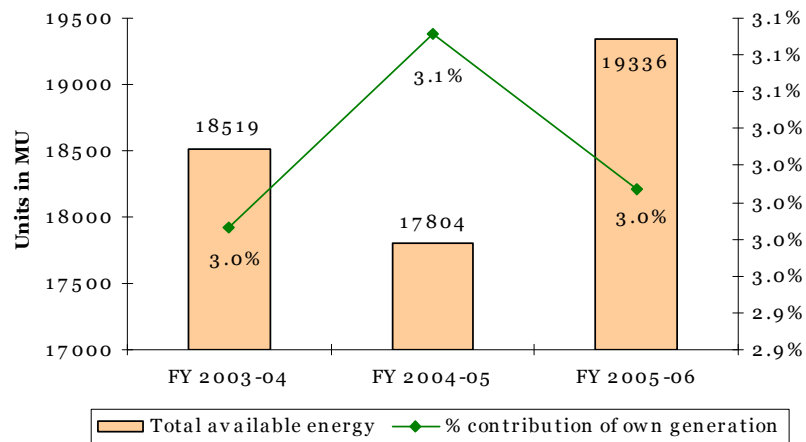


Figure 10.12 Percentage contribution of WBSEB's own generation to the total energy availability over the years

Source: Tariff Orders of FY 2003-04 to 2005-06 and tariff petitions of WBSEB

Power purchase

The various sources of power purchase and the units purchased along with total charges have been summarized in Table 10.16:

Table 10.16 Power Purchase Schedule (units purchased and total charges) over the years

Sources	MU (approved)			Rs. Crore		
	2003-04	2004-05	2005-06	2003-04	2004-05	2005-06
PTC (Chuka)	500	500	500	62.5	62.5	62.5
NEEPCO	220			30.25		
WBPDC (Bandel)	1864	1604	1605.04	286.42	298.84	304.54
WBPDC (Kolaghat)	6026	6026	6766.88	949.88	1096.97	1166.89
DPL	319	207	216.12	53.9	38.71	44.82
WBPDC (Santalidih)	1335	1123	1122.68	243.66	192.22	210.62
NTPC (Farakka)	2370	2685	3000	422.71	472.56	516.84
PTC (Kurichhu)	120	100	100	21.72	18.1	18.1
WBPDC (Bakreshwar)	3410	3596	3745.88	701.03	596.61	711.55
NHPC (Rangeet)	150	147	75	31.65	31.61	23.8
NTPC (Kahalgaon)	805	11	160	171.88	2.31	34.7
DVC	680	610	1482.62	177.83	171.77	317.07
DPSC	170	154	90.54	52.26	46.66	29.57
Govt. of Sikkim (Rangpoo)	0.02	-	0.04	0.01	-	0.001
WBREDA	-	-	1	-	-	0.22
Sub-total (a)	17969	17257	19465.8	3205.7	3098.53	3514.69
Less: UI and grid loss on the energy import from CSGS	-	-	707.76	-	-	-
Net power purchase	17969	17257	18758			
Transmission cost				44.63	66.93	76.42
Sub-total (b)				44.63	66.93	76.42
Wheeling charges				23.38	23.3	1.32
Sub-total (c)				23.38	23.3	1.32
Total power purchase cost				3273.71	3188.76	3509.77

Source: Tariff Orders for FY 2003-04 to 2005-06

In addition to WBSEB's own hydro and thermal generation, it purchases power to meet requirement in the state. The Board has been purchasing power from different power supply agencies namely the West Bengal Power Development Corporation Ltd (WBPDC), the Durgapur Projects Limited (DPL), the Dishergarh Power Supply Company Limited (DPSC), the Damodar Valley Corporation (DVC), the National Thermal Power Corporation Limited (NTPC), the Power Trading Corporation (PTC), the National Hydro Power Corporation (NHPC) and the West Bengal Renewable Energy Development Agency (WBREDA).

As can be seen from the table above, there has been an increase in the units purchased and the purchase costs in FY 2005-06 from the previous years. For FY 2003-04 and FY 2004-05, WBSEB had filed an estimated power purchase cost of

Rs.2721.93 Crore and Rs.3100.22 Crore, respectively. The Commission in its order for the two years approved Rs.3273.71 for FY 2003-04, as it was the estimated actual cost incurred in that year, and Rs.3188.76 Crore as the power purchase cost for FY 2004-05. In FY 2005-06 the Board filed an amount of Rs.3397.38 Crore as power purchase cost, but the Commission approved a power purchase cost of Rs.3509.77 Crore.

The planning of power purchase is done by WBSEB taking into account the following aspects:

- Estimated system demand for the ensuing year based on the average load growth
- Maximum generation that may be available in the Board's Power Stations
- Board's commitment to supply peak system demand
- Optimization of power purchase cost
- Commitment/ potential for export of power to outside region

Although the Commission in its tariff order for FY 2004-05 directed WBSEB to follow the principle of merit order purchase while importing power from different power supply agencies, the Board has repeatedly indicated practical constraints in pursuing the same. The Board has time and again mentioned the following in its tariff petitions.

Quote

It may, therefore, be appreciated that the Board has very little room to play towards following a strict merit order power purchase plan in the interest of its own consumers.

Unquote

Table 10.17 gives the quantum and cost of power purchase as approved by WBERC.

Table 10.17 Approved power purchase cost and units over the years

Description	FY 2003-04	FY 2004-05	FY 2005-06
Unit (MU)	17969.02	17257	18758
Cost of Power Purchase (Rs. Crore)	3273.71	3188.76	3509.77
Average per unit cost (Rs. Per unit)	1.82	1.85	1.87

Source: WBERC Tariff Orders issued for WBSEB from FY 2003-04 to 2005-06

Figure 10.13 shows the trend of power purchase cost as a percentage of the total revenue cost (actual) over the last three years.

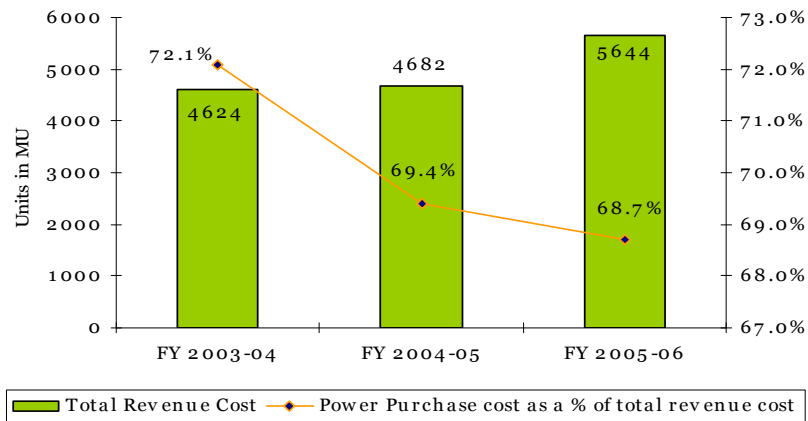


Figure 10.13 Power Purchase cost as a percentage of the total revenue cost (actual data) over the years

Source: WBERC Tariff Orders issued for WBSEB from FY 2003-04 to 2005-06

Trading and UI

The details of trading/export and UI transaction in FY 2003-04, FY 2004-05 and FY 2005-06 in West Bengal are given in table 10.18.

Table 10.18 Details of trading/ export and UI transactions over the years

	Inter-state sale			Outside supply			UI charge
	MU	% of total sale	Average Realization (Rs./ unit)	MU	% of total sale	Average Realization (Rs./ unit)	Net UI Realization (Rs. Crore)
FY 2003-04	3124	24.22%	2.1	46	0.36%	3.54	98
FY 2004-05	3099	22.87%	2.22	73	0.54%	3.28	150
FY 2005-06	3097	21.03%	3.03	96	0.65%	2.54	188

Source: Annual audited accounts of WBSEB for FY 2003-04 and FY 2004-05 and for FY 2005-06 provisional accounts

Employee cost

In FY 2003-04 and FY 2004-05, WBSEB contended that its employees cost per unit sales was lower than the all India average. WBSEB further pointed out that since it supplied power mainly to rural and remote areas, the Board was left with no choice but to maintain a certain minimum level of employees to serve its consumers. The Board indicated that it had a shortage of technical manpower to the extent of 5811 against the sanctioned strength of 28588 and it had no alternative but to opt for contractual engagement of employees. They further informed the Commission that in the non-technical jobs, it had a shortage of 4844 manpower

against sanction of 17558 which was being managed by the its own manpower through different reorientation training programmes.

In FY 2003-04, the Commission had asked WBSEB to submit actual expenditure incurred on employees' remuneration and benefits along with the basis for estimation of payments towards terminal benefits and overtime allowances. However, the Board expressed its inability to provide figures of actual expenses incurred on account of employees cost. Due to lack of detailed employee cost data, the Commission allowed on an adhoc basis, a mark up of 5% over the sum that was allowed in FY 2002-03 and approved Rs. 491.27 Crore in this regard.

In FY 2004-05, the Board was once again unable to submit the employee cost detailed data. WBSEB tried to justify that overtime payments were allowed only to technical staff who were engaged to attend to emergency break-down beyond normal hours particularly during the rainy and festive seasons to minimize periods of interruption. The Commission, however, reached a consensus that the mark up of 5% that was allowed in FY 2003-04 over FY 2002-03 was a little on the higher side and therefore, it decided to approve Rs. 491.27 Crore as employee cost for FY 2004-05 also.

In FY 2005-06, the level of terminal benefits projected by the WBSEB was of the order of 22% of the total employee cost. The Board submitted that the existing staff strength of 29956 was to reduce to 27988 by the end of the year on account of normal and voluntary separation. In addition, the Board indicated that the projected employee cost of Rs. 438.43 Crore included an amount of Rs. 15.02 Crore towards overtime payment on account of technical staff engaged to attend emergency breakdown in order to minimize the period of interruption and to maintain the quality of supply.

The Commission indicated its concern over the high employee cost and advised the Board once gain to submit detailed break-up of the employee cost data. For FY 2005-06, the Commission approved an employee cost of Rs. 425.71 Crore.

Table 10.19 gives a comparison of the proposed, approved and actual employee cost over the last three years.

Table 10.19 Comparison of employee cost- proposed, approved and actual over the years

Year	Proposed	Approved	Actual	
	Rs Crore	Rs Crore	Rs Crore	
FY 2003-04	522.38	491.27	446.48	
FY 2004-05	514.46	491.57	468.31	
FY 2005-06	438.43	425.71	495.66*	*As per

provisional accounts of WBSEB for FY 2005-06

Source: WBERC Tariff Orders from FY 2003-04 to 2005-06, WBSEB Tariff Petitions and Annual accounts of WBSEB

Employee productivity

As indicated in the Figure 10.14, the employee cost as a percentage of ARR declined in FY 2004-05 and then increased in the subsequent year indicating an increase in employee productivity in FY 2005-06. This is further corroborated by observing the trend in employee cost per unit of sale which increased in FY 2004-05 and then declined in the subsequent year.

The employee cost as a percentage of total ARR increased from FY 2003-04 to FY 2004-05, however decreased from FY 2004-05 to FY 2005-06. This is because the ARR that was approved by WBERC in FY 2004-05 was much lower than that approved in FY 2003-04, hence the employee cost as a percentage of total ARR increased during FY 2004-05. Also, the ARR that was approved by the Commission in FY 2005-06, was much higher than that approved in FY 2004-05, hence the employee cost as a percentage of total ARR decreased during FY 2005-06.

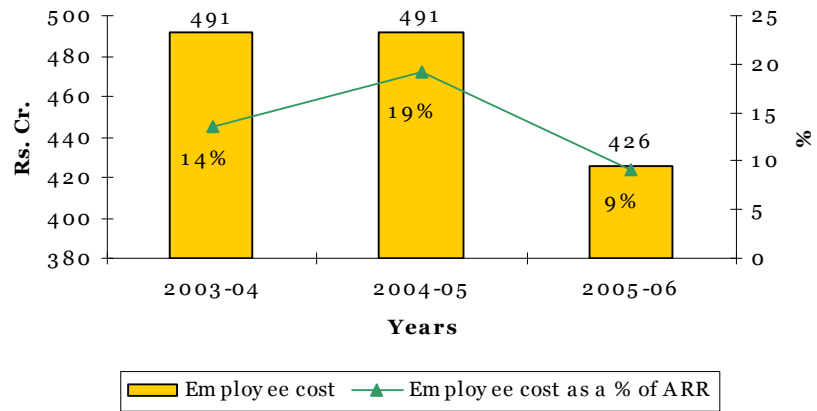


Figure 10.14 Employee cost as a percentage of ARR

Source: Tariff Orders for WBSEB from FY 2003-04 to 2005-06

Table 10.20 Employee cost per unit of sale

Year	Employee cost per unit of sales (Paise/ unit)
FY 2003-04	46.57
FY 2004-05	52.86
FY 2005-06	35.94

Another parameter to measure employee productivity is the number of employees per thousand consumers. Figure 10.15 indicates that the employee productivity in the last five years has been increasing. However, on closely examining the data on trend of number of employees and number of consumers over the last five years, it is seen that although the number of employees has increased by 20% from FY 2001-02 to FY 2005-06, the number of consumers has increased by almost 80% during this period. Hence the reduction in the number of employees per thousand consumers is primarily on account of rapid increase in the number of consumers rather than rationalization of manpower by WBSEB.

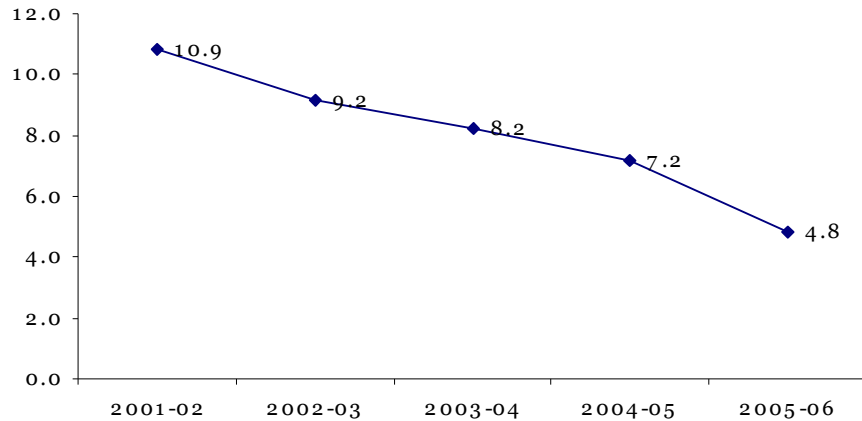


Figure 10.15 Number of employees per thousand consumers

Source: Annual accounts of WBSEB for FY 2003-04, 2004-05, 2005-06

Table 10.21 Revenue per employee

Year	No of employees	Revenue		Revenue/employee
		Rs Crore		Rs/Employee
FY 2003-04	31625	3892	Actual	1230542
FY 2004-05	29956	4130	Actual	1378575
FY 2005-06	27988	4901	Actual	1751068

Source: Annual accounts of WBSEB for FY 2003-04 to FY 2005-06

The revenue per employee is showing an increasing trend representing improving productivity.

Repair and maintenance expenses

In FY 2005-06, WBERC approved the same R&M expense as proposed by WBSEB, however the Commission advised the Board to develop a proper plan for preventive maintenance of its transmission and distribution installations that are scattered over a vast area and to put the same in action, in a time bound manner. The Commission also directed WBSEB to show some positive improvement in respect of quality of power supplied by it.

Table 10.22 gives a comparison of the proposed, approved and actual employee cost over the last three years.

Table 10.22 R&M expenses (proposed, approved and actual) over the years

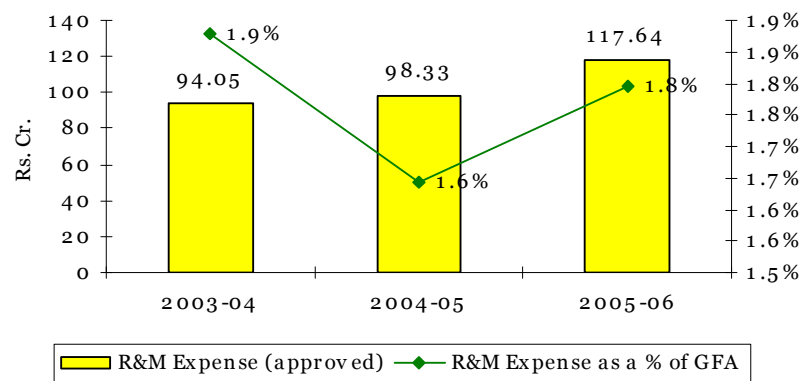
Year	Proposed	Approved	Actual
	Rs Crore	Rs Crore	Rs Crore
FY 2003-04	94.05**	94.05**	69.93
FY 2004-05	98.33**	98.33**	81.47
FY 2005-06	117.64	117.27	88.80*

*As per provisional accounts of WBSEB for FY 2005-06

**O&M expenses as submitted in WBSEB's tariff petitions and as approved by WBERC in tariff orders for FY 2003-04 and 2004-05

Source: Tariff Orders for WBSEB from FY 2003-04 to 2005-06

Figure 10.16 highlights the R&M expenditure as a percentage of the Gross Fixed Assets (GFA) over the past three years (approved figures).

**Figure 10.16** Repair and maintenance expenses as a percentage of GFA

Source: Tariff Orders for WBSEB from FY 2003-04 to 2005-06

Administrative and General Expenses

The Administrative and General (A&G) expenses include expenses on the heads relating to rents, rates and taxes, insurance, security charges, telephone, legal, travel, vehicle, printing, etc. In FY 2003-04, the WBERC approved A&G expenses equivalent to that proposed by WBSEB. This was an increase of 25% over the projected expenses of FY 2002-03. The Board justified the increase in expenses on vehicle running and vehicle hiring due to increase in consumer services along with the monitoring drive against theft of power and they justified the increase in legal expenses due to the regulatory process. On account of expenditure being incurred on consumer services and setting up of activities to control theft, the Commission allowed the expenses as proposed by the Board. The Commission, however, indicated that it would monitor the progress achieved by the Board in this regard and advised the Board to control the expenses to the extent possible.

In FY 2004-05, the Commission approved Rs. 68.47 Crore as proposed by the Board towards A&G expenses. The Board justified that it would require the fund for sustaining the increased activities on the front of consumer services, revenue monitoring, drive against theft of power, etc. The Commission indicated that it would like to see the progress that WBSEB achieves with regard to the justified A&G expenses in the next year.

In FY 2005-06, the Board submitted a detailed break-up of the A&G expenses to the Commission. This is summarized in table 10.23.

Table 10.23 Break-up of A&G expenses (proposed by WBSEB) for FY 2005-06

A&G expenses	Rs. Crore
Rent, Rates and Taxes	6.73
Legal charges	1.45
Audit fees	1.54
Others ¹	62.83
Total	72.55

Source: Tariff Petition of WBSEB for FY 2005-06

The Commission noted that WBSEB had increased its activity of consumers' services, revenue monitoring, drive against theft of power and set up Loss Prevention Wing decentralizing its functions upto circle level. The Commission indicated that it would encourage activities of WBSEB towards prevention / minimization of loss – both technical and commercial. WBERC also noted that the expenditure towards Rent, Rates & Taxes and also on Audit fees was in the nature of committed expenses. Hence the Commission allowed the A&G expense as proposed by WBSEB. Table 10.24 gives a comparison of the proposed, approved and actual A&G expenditure over the years.

Table 10.24 A&G expenses (Proposed, approved and actual) over the years

Year	Proposed	Approved	Actual
	Rs Crore	Rs Crore	Rs Crore
FY 2003-04	65.14	65.14	59.50
FY 2004-05	68.47	68.47	63.94
FY 2005-06	68.95	68.95	77.38*

* As per provisional account of WBSEB for FY 2005-06

Source: Tariff Orders for WBSEB from FY 2003-04 to 2005-06 and WBSEB annual accounts

¹ The other A&G expenses include Insurance, Security expenses, Telephones, Trunk calls, Postage, Conveyance and Travelling, Printing and Stationery, Service charges for P&T employees and Freight related expenses. Out of the total Other A&G expenses, Rs. 3.60 Crore were proposed to be allocated to ongoing capital works and the balance Rs. 53.89 Crore was to be charged to the Revenue account.

Figure 10.17 highlights the A&G expenses as a percentage of sales and as a percentage of total ARR. As observed from the above table and Figure 10.19, although the A&G expenses have been increasing in the last three years, the A&G expenses per unit of sales and the A&G expenses as a percentage of total ARR, has increased from FY 2003-04 to FY 2004-05, however decreased from FY 2004-05 to FY 2005-06. This is because the ARR that was approved by WBERC in FY 2004-05¹, was much lower than that approved in FY 2003-04, hence the A&G expenses as a percentage of total ARR increased during FY 2004-05. Also, the ARR that was approved by the Commission in FY 2005-06, was much higher than that approved in FY 2004-05, hence the A&G expenses as a percentage of total ARR decreased during FY 2004-05.

Similarly, the total sales approved by the Commission in FY 2004-05² was lower than that approved in FY 2003-04, as a result of which, the A&G expenses per unit of sales increased during FY 2004-05. And the total sales approved by the Commission in FY 2005-06 was much higher than that approved in FY 2004-05, as a result of which, the A&G expenses per unit of sales declined during FY 2005-06.

¹ Refer to table 10.33

² Refer to table 10.4

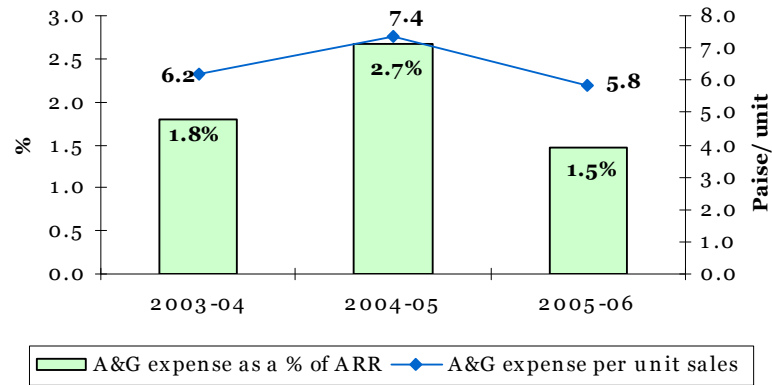


Figure 10.17 A&G expense as a percentage of ARR and per unit sales

Source: Tariff Orders for WBSEB from FY 2003-04 to 2005-06

Total operating expenditure (Employee cost, R&M and A&G expenses)

The operation and maintenance cost primarily consists of three major components viz. employee cost, repair and maintenance costs and administration and general expenses. The share of O&M costs as a percentage of ARR was around 18% in FY 2003-04 which increased to 26% in FY 2004-05 and then decreased to 13% in FY 2005-06. The graph showing total O&M costs as a percentage of approved ARR is illustrated in Figure 10.18.

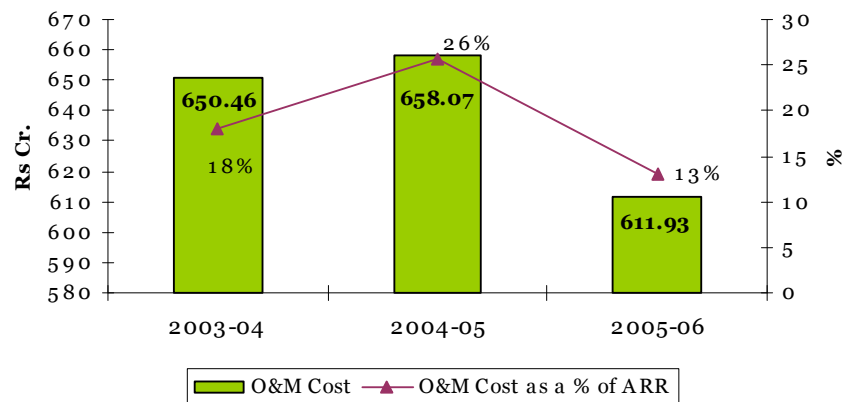


Figure 10.18 O&M cost as a percentage of ARR

Source: Tariff Orders for WBSEB from FY 2003-04 to 2005-06

Table 10.25 gives the operating expenditure (proposed, approved and actuals) over the years.

Table 10.25 Operating expenditure over the years

Year	Proposed	Approved	Actual	Per unit of sale*	As a percentage of ARR*
	Rs Crore	Rs Crore	Rs Crore	Paise/ unit	%
FY 2003-04	681.57	650.46	575.91	61.7	18%
FY 2004-05	681.26	658.07	613.72	70.8	26%
FY 2005-06	624.65	611.93	661.84	51.7	13%

* Based on approved figures

Source: Tariff Orders for WBSEB from FY 2003-04 to 2005-06 and WBSEB annual accounts

As observed, the O&M expenses per unit of sales and a percentage of total ARR has increased from FY 2003-04 to FY 2004-05 and then decreased from FY 2004-05 to FY 2005-06. The reason for this has been explained earlier in the sub-section on A&G expenses.

Depreciation

In FY 2003-04, the Board had claimed depreciation of Rs. 279.27 Crore and worked this out in accordance with the terms of the notification issued by the Government of India under the provision of the Electricity (Supply) Act 1948. The Board however, did not submit any techno-economic justification and other required details for incurrence of the huge capital expenditure. The Commission indicated to the Board that the incurrence of huge capital expenditure affects interest, depreciation and return and went against the stand of the WBSEB that they had not been able to control the T&D loss because they could not spend sufficient capital expenses on the transmission and distribution assets. Further, the complete and full details of the capital expenses were not provided by the Board, when it was required. On this basis, Commission approved Rs. 200 Crore towards depreciation allowance in FY 2003-04.

In FY 2004-05, WBSEB claimed a depreciation amount of Rs. 311.02 Crore. The Commission once again indicated that the techno-economic justification for the incurrence of capital expenditure was not provided by the Board. The Commission further highlighted that since WBSEB's generation during the year was very limited, the major part of the capital expenditure should have been attributed towards improvement in the transmission and distribution system. Based on this, due to lack of complete details submitted by the Board, the Commission approved depreciation amount of Rs. 274.67 Crore.

In FY 2005-06, the Commission approved the depreciation amount proposed by the Board. The Commission highlighted that the depreciation amount was computed by the Board as per the notification issued by the Central Government under the

provisions of the Electricity (Supply) Act, 1948. The Commission indicated that provisionally the amount that was approved during FY 2005-06 would be subject to adjustment during the next Tariff revision process. The Commission also directed WBSEB to submit detailed calculations in the next tariff petition as per the provisions of the Companies Act, 1956 or any other norm as set by the Commission.

On 21st November 2005, WBERC notified the, 'Terms and conditions of tariff regulations, 2005' with a detailed format of the Depreciation Schedule. Subsequent to this, the Board in its tariff petition for FY 2006-07 computed the depreciation amount based on the methodology and rates as specified in the WBERC regulations.

Table 10.26 gives the comparison of the proposed, approved and actual depreciation amount.

Table 10.26 Depreciation amount (proposed, approved and actual) over the years (Rs. Crore)

Year	Proposed	Approved	Actual	Basis
FY 2003-04	279.27	200	319.78	As per provisions of the Electricity (Supply) Act 1948
FY 2004-05	311.02	274.67	347.73	As per provisions of the Electricity (Supply) Act 1948
FY 2005-06	394.14	394.14	396.32	As per WBERC Terms and Conditions of Tariff, 2005

Source: Tariff Orders for FY 2003-04 to FY 2005-06 and Annual accounts of WBSEB from FY 2003-04 to 2005-06

Sources of funds

Accelerated Power Development & Reforms Program (APDRP)

The Board has stated the following projects with a total outlay of Rs.448.50 Crore under the APDRP for improvement of sub transmission and sub distribution network.

Table 10.27 Details of APDRP schemes (as on 30th June 2006)

Schemes	Year of sanction	Project cost (Rs. Crore)	Percentage of work completion
3 Circle Scheme	16 th July 2002	132.71	97%
8 Town Scheme	20 th May 2003	71.55	64%
5 Town Scheme, GIS mapping of power and automation of distribution system of Jadhavpur University	28 th November 2003	216.66	34%
2 City Improvement Schemes	23 rd March 2005	27.58	0%

Source: Website of APDRP, www.apdrp.com accessed in December 2006

The schemes inter alia cover installation of energy meters, construction and re-conductoring of 11 kV lines, installation of 100 kVA transformers, computerization of billing etc so as to

reduce T&D loss, facilitate new service connections and accounting of energy. Under the schemes, Government of India provides 25 percent of the project cost of these schemes as grants, besides giving incentive for reduction of revenue deficit of the Board.

West Bengal is divided into 21 revenue circles for implementation of the above scheme. All the 21 circles have approved DPR's. The total project outlay is Rs.442 Crore with the APDRP component being Rs.131 Crore. Rs.93 Crore has already been released so far.

Figure 10.19 gives the status of implementation of this scheme in West Bengal as on 30th June 2006.

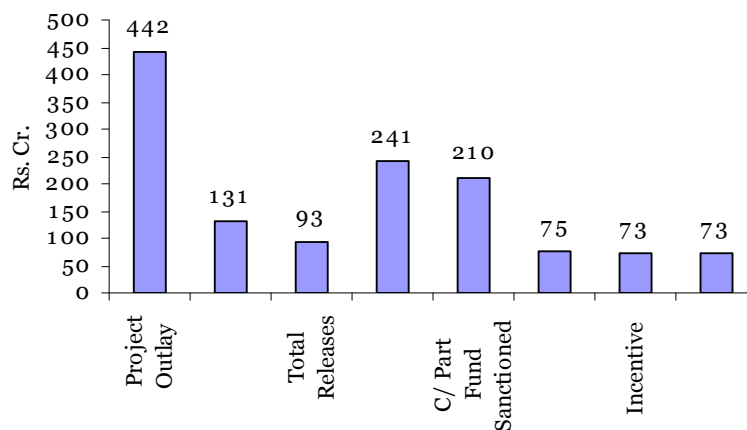


Figure 10.19 Details of APDRP disbursements and utilization

Source: Website of APDRP, www.apdrp.com accessed in December 2006

Status of PFC lending

The status of PFC lending in West Bengal as on 5th October 2006 is given in Table 10.28:

Table 10.28 Status of PFC lending

Utilities	Total Sanctions (Rs. Million)	Total Disbursements (Rs. Million)
Calcutta Electric Supply Company	3216.8	3216.64
Damodar Valley Corporation	27526	4645.17
Durgapur Projects	12925	8352.19
West Bengal Power Development Corporation	17413.69	10467.4
West Bengal Renewable Energy Development Agency	33.9	
West Bengal Rural Development Corporation	2.51	2.51
West Bengal State Electricity Board	9977.74	4062.93
Total	71095.65	30746.83

Source: PowerLine. Volume 11. No 2, October 2006

Interest and finance charges

The Board submitted interest and other financing charges (net of capitalization) of Rs.993.33 Crore for FY 2003-04 and Rs.591.19 Crore for FY 2004-05. The Commission approved Rs.418.69 Crore (and Rs 36276 Crore net of capitalization) respectively. The Commission approved a negative amount of Interest and Finance charges for FY 2004-05 because while computing the amount chargeable to the revenue account, the earlier years' excess interest amount of Rs.637.96 Crore was adjusted during the year. For FY 2005-06, the Board filed an amount of Rs.260.32 Crore towards interest on loan and a total of Rs.339.04 under the category of interest and finance charges. The Commission approved a total amount of Rs.161.85 Crore chargeable to the revenue account. Table 10.29 gives the interest and finance charges proposed and approved including interest on borrowing, other finance charges and the total amount chargeable to the revenue account.

Table 10.29 Details of interest and finance charges (proposed and approved) over the years (Rs. Crore)

Interest & Finance charges	Proposed			Approved		
	2003-04	2004-05	2005-06	2003-04	2004-05	2005-06
Interest on borrowing	896.32	395.58	173.59	857.35	395.58	161.85
Other Interest	534.19 ¹	157.30 ²	274.28	-	78.65	173.59
Other Finance charges	28.91	38.31	45.66	28.91	38.31	5.00
Total	1459.42	591.19	447.87	886.26	512.54	703.69
Estimated capitalization of Interest on borrowings (Less)	466.09	237.34	344.85	445.82	875.30 ⁴	541.84
Amount chargeable to revenue account	993.33	353.85	260.32	418.69 ³	(362.76)	161.85

¹Interest on fund for liquidation of dues to Central Public Sector Undertakings (CPSUs)

²Interest on account of Securitization scheme for power purchase dues (on Rs. 1850.62 @ 8.5%

³Less Interest disallowed on disallowed capital cost of Rs. 150 Crore @ 14.5%

⁴Includes adjustment of earlier years' excess interest amount of Rs.637.96 Crore

Source: Tariff Orders for WBSEB from FY 2003-04 to 2005-06

In FY 2003-04, FY 2004-05 and FY 2005-06, the Interest and Finance charges did not include the component of interest on working capital. Based on the WBERC terms and conditions of tariff regulations, 2005, the Board in its tariff petition for FY 2006-07 included interest on notional working capital (since the requirements of working capital are met by the Board from its own sources).

Provision of bad and doubtful debts

In FY 2003-04, the Board proposed Rs. 21.37 Crore towards bad and doubtful debts and justified the same on account of earlier revenue management through manual systems and large coverage of area. The Commission, however, noted that the total

outstanding amount of debtors was large and some of them had been continuing from a very long time. The Commission directed the Board to look into the position of debtors and take up immediate action for speedy recovery. The Commission approved an amount of Rs. 1 Crore towards bad and doubtful debts in FY 2003-04.

In FY 2004-05, the Board forecasted an amount of Rs. 8.16 Crore towards provision for bad and doubtful debts. The Commission once again directed the Board to take up immediate action for speedy recovery of such amounts and approved an amount of Rs. 2.16 Crore in FY 2004-05 towards bad and doubtful debts.

In FY 2005-06, the Board submitted that the primary reason for the large amount of unrealized dues of WBSEB for a long period is on account of disputes/litigation with the consumers. The Board had constituted an Empowered Committee in the month of September 2003, to resolve this matter and ensure realization of the Board's dues relating to centralized and decentralized bulk consumers. At present the Committee is authorized to take final decision in respect of individual cases where total dues originally payable by the consumers are waived to the tune of 20 lakhs. In case of waiver of dues exceeding 20 lakhs, specific recommendations are submitted to the Board for their approval. The empowered committee has settled 48 cases in respect of centralized and decentralized bulk consumers during the first six months of FY 2005-06. During the settlement of these cases, Rs. 7.09 crore was waived by the Empowered Committee. Table 10.30 gives the total amount of dues settled vis-à-vis the amount waived during the first six months of FY 2005-06.

Table 10.30 Total amount of dues settled vis-à-vis amount waived (Rs. Crore)

Total amount of dues lying disputed/unsettled	Amount settled by the Committee	Amount waived	Remarks
10.87	3.78	7.09	The settle amounts are being realized

Source: Tariff Petition of WBSEB for FY 2005-06

The Commission indicated that this step taken by WBSEB was appropriate and beneficial to the consumers; it would enable the utility to avoid borrowings to some extent and also the burden of interest on tariff. The Commission approved an amount of Rs. 15 Crore towards bad and doubtful debts in FY 2005-06.

Table 10.31 gives the proposed, approved and actual amounts of bad and doubtful debts during the past five years.

Table 10.31 Bad and doubtful debts (proposed, approved and actual) over the years (Rs. Crore)

Year	Proposed	Approved	Actual	
			Bad and doubtful debts written off	Bad and doubtful debts provided for
FY 2001-02	9.34	9.34	-	9.17
FY 2002-03	8.22	1.00	-	7.02
FY 2003-04	21.37	1.00	-	8.25
FY 2004-05	8.16	2.16	27.16	2.39
FY 2005-06	30.23	15.00	1.76	1.62

Source: Tariff Orders for FY 2003-04 to 2005-06 and annual accounts of WBSEB for 2003-04 to 005-06

Rate of return

In FY 2003-04, WBSEB proposed an amount of Rs.60.27 Crore as return on capital base. This was based on a rate of return of 3% on net fixed assets in service at the beginning of the year as per the provision of the Electricity (Supply) Act 1948. During FY 2003-04, the Commission disallowed capital cost to the tune of Rs.150 Crore on account of abnormal cost overrun in the construction of the Teesta Canal Fall Project and non-identification of non-functional fixed assets. As a result, although the Commission approved the Board's computation of Rs.60.27 Crore towards return on equity, it reduced the same by Rs.4.50 Crore on account of capital cost disallowance and finally approved an amount of Rs.55.77 Crore.

In FY 2004-05, the Board proposed return on equity equal to Rs.64.70 Crore equivalent to 3% rate of return on net fixed assets in service at the beginning of the year. The Commission once again admitted the amount submitted by the Board but reduced the same by Rs.4.50 Crore on account of capital cost disallowance as mentioned earlier, and finally approved an amount of Rs.60.20 Crore towards return on equity during FY 2004-05.

In FY 2005-06, WBSEB submitted that since the admissible return of the Board as per the Electricity Act 2003 was not known, it had considered a rate of return as per the Electricity (Supply) Act, 1948 of 3% on Net Fixed Assets as the beginning of the year, as Rs.78.68 Crore. The Commission indicated that since the Electricity Act 2003 had come into force, the Board should be guided by the relevant regulations and the National Policies. As per the WBERC Terms and Conditions for Tariff Regulations 2003, the Board as a Licensee is to get a reasonable return on its equity capital. As a result, on the basis of the equity capital of the Board, the Commission approved a reasonable

return amount of Rs.179.22 Crore This was based on a rate of return of 13.25% (SBI PLR + 3%) on the equity capital.

Table 10.32 Proposed and approved return on equity amount over the years (Rs. Crore)

FY 2003-04		FY 2004-05		FY 2005-06	
Proposed	Approved	Proposed	Approved	Proposed	Approved
60.27	55.77	64.70	60.20	78.68	179.22
Basis for proposed amount was 3% return on capital base; basis for approved amount- adjustment for disallowance of capital cost		Basis for proposed amount was 3% return on capital base; basis for approved amount- adjustment for disallowance of capital cost		Basis for proposed amount was 3% return on capital base; basis for approved amount- reasonable return on equity capital of the Board @ 13.25% (SBI PLR+3%)	

Annual Revenue Requirement (ARR)

Table 10.33 shows a comparison of the elements of ARR (proposed and approved) over the last three years.

Table 10.33 Comparison of proposed and approved ARR over the last three years (in Rs. Crore)

Particulars	2003-04			2004-05			2005-06		
	WBSEB	WBERC	Actual	WBSEB	WBERC	Actual	WBSEB	WBERC	Actual
Fuel cost for Power Generation	1.29	0.4	0.51	0.6	0.6	0.54	0.45	0.45	0.6
Purchase of Power	2721.93	3273.71	3333.53	3100.22	3188.76	3250.33	3397.39	3509.77	3877.87
Interest and Finance charges (net of capitalization)	993.33	418.69	490.93	353.85	-362.76	542.59	339.04	199.91	751.64
Depreciation	279.27	200	243.51	311.02	274.67	300.47	394.14	394.14	352.17
Employee cost	522.38	491.27	371.66	514.46	491.27	395.31	438.43	425.71	495.66
R&M	94.05	94.05	69.93	98.33	98.33	81.47	117.27	117.27	88.8
A&G	65.14	65.14	55.96	68.47	68.47	60.65	68.95	68.95	77.38
Provision for Doubtful Debts	21.37	1	8.25	8.16	2.16	2.39	30.23	15	1.62
Reasonable Return on Equity	60.27	55.77		64.7	60.2		78.68	179.22	
Gross Fixed Charges	1883.39	1137.15	1290.35	1262.7	480.3	1431.62	1388.06	1220.98	1765.65
Total Revenue Cost	4606.61	4411.26	4624.39	4363.52	3669.66	4682.49	4785.9	4731.2	5644.12
Less: Miscellaneous receipts/ Other Income (Non-Tariff)	80	100	388.25	114.94	100	294.66	111.3	111.3	371.15
GoWB support	0	0		0	0		0	0	
Net ARR	4586.88	4367.03	3891.59	4313.28	3629.86	4129.66	4753.28	4701.99	4900.89

Source: Tariff Orders for FY 2003-04 to 2005-06 and annual accounts of WBSEB for 2003-04 to 2005-06

As observed, in each year the approved ARR has been less than the ARR proposed by the Commission and in each year the actual expenditure has exceeded the approved amount.

Table 10.34 gives the trend of percentage contribution by the different cost elements to the total revenue cost (actual data) during the past three years.

Table 10.34 Percentage contribution by different cost elements to the total revenue cost in FY 2003-04, 2004-05, 2005-06

Percentage contribution by different cost elements	FY 2003-04	FY 2004-05	FY 2005-06
Fuel cost for Power Generation	0.0%	0.0%	0.0%
Purchase of Power	72.1%	69.4%	68.7%
Interest on loan	0.0%	0.0%	0.0%
Interest on Consumer's Security Deposit	0.0%	0.0%	0.0%
Other Finance charges	0.0%	0.0%	0.0%
Interest and Finance charges (net of capitalization)	10.6%	11.6%	13.3%
Depreciation	5.3%	6.4%	6.2%
Employee cost	8.0%	8.4%	8.8%
R&M	1.5%	1.7%	1.6%
A&G	1.2%	1.3%	1.4%
Provision for Doubtful Debts	0.2%	0.1%	0.0%
Reasonable Return on Equity	0.0%	0.0%	0.0%
Total Revenue Cost (Rs. Crore)	4624.39	4682.49	5644.12

Source: Annual accounts of WBSEB, FY 2003-04 to 2005-06

The table above clearly indicates that the major contributor to the total revenue cost is the power purchase cost. In the fixed cost elements, the maximum percentage share of the total revenue cost is the interest and finance charges which have been increasing over the years.

Figure 10.20 indicates the trend of proposed, approved and actual ARR over the past three years.

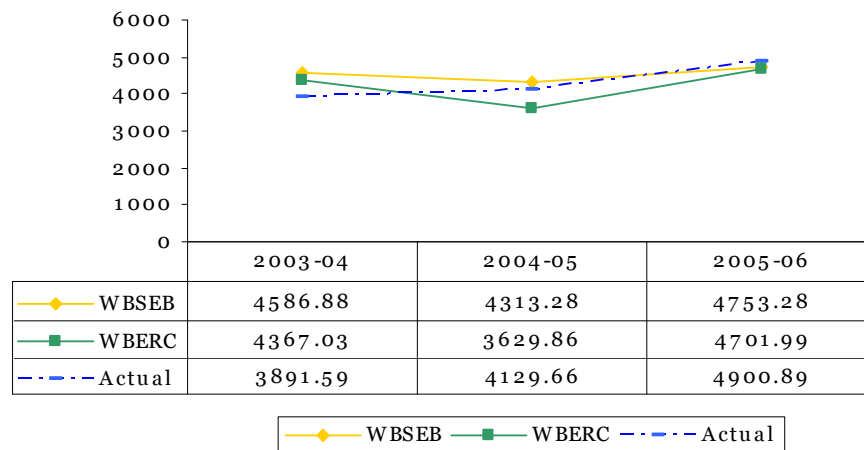


Figure 10.20 Proposed, approved and actual ARR over the last 3 years

Source: Tariff Orders from FY 2003-04 to 2005-06, annual accounts of WBSEB

Tariff /rate balancing

Tariff rationalization

The WBSEB in its tariff proposal for FY 2005-06 submitted that it had followed the following main principles while setting tariff for the year:

A) Proposed changes:

- Fixed Charge in respect of LT Industrial consumers was proposed to be changed from the existing rate of Rs.10/- per consumer per month to Rs.10/- per HP per consumer per month
- Energy charge for metered agriculture consumers was reduced by 40 Paise per unit
- Fixed charge for un-metered agriculture consumers was considered @ 110% of the metered rate
- The Monthly Minimum charge @ Rs 1000 / KW payable by HT Commercial Consumers was proposed to be abolished
- A 10% hike in energy charge was proposed for Street light, LT Public Water Works & Cold Storages.
- To minimize the gap in the slab rate between Urban & Rural Domestic consumers, the energy charge in the first two slabs of Rural Domestic consumers was enhanced to a higher extent compared to the corresponding enhancement for Urban Domestic consumers

B) No changes were proposed in miscellaneous charges i.e. meter rentals, disconnection/ reconnection charges, fuse call etc.

C) According to the existing policy of the government of West Bengal a rate for stand by charge was proposed for any HT/EHT consumers running their captive plant on a continuous basis having an agreement executed with the board for back up/stand by/emergency power would be liable to pay monthly demand charge on the basis of contract demand at twice the normal demand charge rate provided actual maximum demand recorded did not exceed the contracted demand. If however actual demand drawn exceeded the contracted demand, the excess demand would be charged at thrice the normal demand charge rate.

D) Power supply to Agriculture consumers with dedicated feeder was proposed to be given during non-peak hours only

E) Monthly Demand charge would be levied on the basis of maximum demand recorded during the month or 75% of the contract-demand whichever is higher subject to minimum of 50 KVA.

While approving the tariff for FY 2005-06, the Commission indicated the following additional points:

- For those consumers under TOD metering, the peak period energy charge would be 50% more than the normal energy charge indicated in the tariff schedule, for the respective category of consumers. The off-peak period energy charge would be less than normal energy charge by 31% of normal energy charge
- In case of drawal of power in excess of the sanctioned contract demand, a penalty clause and additional charges for the excess demand (for TOD consumers) has been specified by the Commission.
- A rebate for timely payment to all consumers to the tune of 2% of the amount of the bills, excluding taxes, duties, levies and arrears, has been specified by the Commission. Further, in line with the National Electricity Policy, the Commission has indicated, a special supportive rebate of 2% to such domestic consumers whose consumption of electricity is limited to 25 units per month.
- The Commission indicated that all statutory levies like electricity duty or any other taxes, duties etc. imposed by the State Govt. /Central Govt. or any other competent authority would be extra and not a part of the tariff that was being approved.

The WBERC notified the “Terms and conditions of Tariff Determination Regulation, 2005” on 21st November 2005. It detailed the terms and conditions of tariff setting for generation, transmission and distribution along with the depreciation schedule. Further, in October 2006, it revised the terms and conditions of tariff regulation, 2005 and circulated the Draft tariff regulation on 23rd October 2006 for comments. The draft tariff regulation of the Commission has introduced several new initiatives, which are discussed below.

New initiatives in tariff design

1. Implementation of multi-year tariff framework

The Commission had uploaded the West Bengal Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2006 on its website on 23rd October 2006 for comments and suggestions. These regulations were to be implemented in place of the West Bengal Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2005. Objections/suggestions and comments were invited from all stakeholders and interested parties upto 24th November 2006. The Commission is in the process of incorporating the comments of stakeholders and will be notifying the final tariff regulations, shortly. One of the important characteristics of the draft regulations is the

“Multi-year Tariff (MYT) Framework”. Some of the salient features of the MYT framework as outlined in the draft regulations are summarized in Table 10.35 below.

Table 10.35 Salient features of draft tariff regulations

Functions	Specific provisions in draft regulations with regard to MYT
Multi-year Tariff Framework	<ul style="list-style-type: none"> - Trajectory based of normative parameter spreading over the control period will be stipulated by the Commission as operational target parameter for improvement / sustenance of the operation of the generating company or licensee. This specific parameters will include the following: <ul style="list-style-type: none"> a. Station heat rate, plant load factor, availability factor, oil consumption rate and auxiliary consumption rate for thermal power station; b. Capacity index, auxiliary consumption rate, plant load factor and transformation losses rate for hydro power station; c. Ratio of pumping energy and generated energy, auxiliary consumption rate and availability rate, transformation losses of pumped storage plant; d. Combined Technical losses and non-technical losses (T&D loss) of distribution and transmission licensee. - ARR is to be based on normative parameter of the above trajectory as stipulated by the Commission - Annual review of performance vis-à-vis the approved projection and categorization of variations in performance into those that were caused by factors within the control of the generating company or transmission / distribution licensee (controllable factors) and those caused by factors beyond the control of the generating company or transmission / distribution licensee (uncontrollable factors); - Any variation arising out of controllable factors using normative parameters, wherever applicable, for determinations of allowable normative expenditure on that factor, shall be borne by licensee or generating company;
Control Period	<ul style="list-style-type: none"> - The first control period under the Multi Year Tariff framework shall be of duration of 1 year commencing from financial year 2007 – 2008 for all licensee and generating companies for their conventional sources of generating station. - Thereafter, second control period will be of 3 years. Thereafter, each control period shall be normally for a period of 5 years or such other periods as may be decided by the Commission from time to time
Contents of MYT filing	<ul style="list-style-type: none"> - For licensees' range of auxiliary consumption, transmission and / or distribution losses for technical and non-technical losses (T&D losses) for each ensuing years of the control period for the purpose of incentive / penalties. The transmission and / or distribution licensee shall file a trajectory of the loss levels in respect of technical and non-technical losses for each of the ensuing years of the control period, backed up by proper studies to justify the loss levels indicated.
Targets	<ul style="list-style-type: none"> - Targets set for items that are deemed by the Commission as “controllable”. - Trajectory for specific variables may be stipulated by the Commission where the performance of the applicant is sought to be improved upon through incentives and disincentives. Such variables for which trajectory may be stipulated include, but are not limited to, auxiliary consumption, technical and non-technical losses, station heat rate, oil rate, target availability factor and target plant load factor.

Source: Draft West Bengal Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2006 accessed at www.wberc.net in November 2006

2. Initiatives towards Demand side management

The Commission has time and again advised WBSEB to take action towards Demand Side Management and Conservation of

Energy by adopting energy efficient process and by using energy efficient gadgets.

In the tariff order for FY 2005-06, the Commission included the following provisions:

- In order to reduce the system demand during evening peak period through Demand Side Management, Time of Day (TOD) tariff for the Board's Industrial consumers is to be introduced in terms of which the peak period energy charge will be 50% more than the normal energy charge indicated in the tariff schedule. The off-peak period energy charge will be less than the normal energy charge by 31% of normal energy charge to all of such category of consumers as indicated in the tariff schedule.
- For TOD consumers, drawal of power in excess of sanctioned contract demand will attract following additional charge for excess demand. This additional charge shall be in addition to demand charges calculated according to tariff schedule for the total amount of maximum demand during the billing period.

Table 10.36 Additional charges for extra demand

Sl. No.	Period	Additional Demand Charge
A	During normal period (6.00 hrs. - 17.00 hrs.)	20% extra on the quantum of demand which is in excess of sanctioned contract load
B	During peak period (17.00 hrs. - 22.00 hrs.)	50% extra on the quantum of demand which is in excess of sanctioned contract demand
C	During off-peak period (22.00 hrs. - 6.00 hrs. of the following day)	(i) Nothing up to 30% extra demand. (ii) 20% extra on the quantum of demand, which is in excess of 130% of the contract demand.

Source: Tariff Order for WBSEB for FY 2005-06

- While in case of drawal of non-TOD consumers exceeds the contracted demand in any month, demand charge as specified in the tariff schedule shall be applied on recorded maximum demand for that month. In addition to this, additional demand charge in the case of non-TOD consumer shall be 50% extra on the quantum of demand by which the recorded maximum exceeds the contracted demand.

Following the directives given by the Commission in its tariff order for FY 2005-06, WBSEB has undertaken the following steps with regard to demand side management:

- i) WBSEB has introduced high voltage distribution supply system, mainly, for supplying power to Irrigation/Agricultural consumers directly from Dist. Sub-Station through drawal of LT PVC cable. For this purpose, Dist. Sub-Station of the capacity of 10 KVA, 11/0.4 KV for every two STW consumers have been considered. This is in view of minimising loss in the peak period and management of demand thereof.
- ii) WBSEB contemplated to supply agricultural consumers through dedicated feeder and had also given an option to give supply to agricultural consumers at TOD basis. For this, those who shall opt shall pay normal tariff during normal time; 50% of the normal tariff during off-peak period and twice the rate of normal tariff during peak hours. The consumers with a minimum load of 500 kVA may opt for TOD metering. The consumers who will so opt shall pay normal tariff during normal time, 50% of the normal tariff during off-peak period and twice the rate of normal tariff during peak period.
- iii) TOD metering for HT Commercial consumers and HT public utility services are presently made optional. PHE Directorate had already opted for TOD tariff for a new connection at the Dist. North 24-Parganas.
- iv) WBSEB has been interacting with the consumers of the above-mentioned categories over whom TOD metering has been made optional, explaining to them the feature of TOD metering system and encouraging them to opt for the same.
- v) Agricultural consumers mainly STWs who are currently on un-metered supply for irrigation purposes are being brought within the fold of Metered supply. WBSEB in its action plan have taken action towards metering of 1 (one) lakh un-metered supply to STWs having arrangement of TOD metering system within two years.
- vi) WBSEB have already included 1251 HV consumers in the TOD metering system. Out of this, 1182 nos. of 11 KV consumers, 62 nos. of 33 KV consumers and 7 nos. of 132 KV consumers have been under TOD metering arrangement with applicability of TOD tariff.

3. Promotion of renewables

The WBERC has notified regulations on “Cogeneration & generation of electricity from Renewable Sources of energy” 2006 on 4th May 2006. Due consultation with all stakeholders was undertaken by the Commission before the finalization of these regulations.

Some of the important provisions of these regulations are given below.

- The renewable energy sources that qualify under this regulation are small/mini/micro hydel project up to 25 MW capacity, wind, solar, biomass based on 100% producer gas or combustion route, urban/municipal waste, industrial waste, geothermal, tidal, ocean trend energy conversion (OTEC).
- The licensees have to purchase during the years FY 2006-07 and FY 2007-08 a minimum quantum of electricity as specified below from cogeneration and renewable sources expressed as percentage of their total consumptions during the respective years.
- For subsequent years the Commission will separately notify the purchase obligation and may raise the percentage based on availability as the Commission deems fit.
- Purchase obligation for licensees as specified in the table below are minimum percentage of purchase to be maintained by the licensees. The licensees have the option to purchase higher percentage with the approval of the Commission.
- The licensee has to source the proposed quantum of electricity from cogeneration and renewable sources of energy within the State
- Energy from cogeneration and non-conventional energy sources generated within West Bengal and used for captive purposes within the State through open access shall be taken into account for computing the fulfillment of purchase obligation of distribution licensees whose systems have been utilized for transmission and wheeling of such energy. The share of purchase obligation of such energy will be divided equally among all the participating distribution licensees.
- Tariff for purchase of electricity from cogeneration and renewable sources shall be agreed mutually by the licensees and the suppliers at a level not above the price cap indicated by the Commission in these regulations. Price cap for similar type of renewable sources of energy shall be the same.
- The price at which the renewable energy from *biomass source* can be sold to the licensee is capped at Rs.3.35 per kWh and shall remain fixed for three years from the date of commissioning. For *wind energy*, the price cap shall be at Rs.4.00 per kWh for three years from the date of commissioning and for energy from *small hydel* projects, the price cap is fixed at Rs.3.60 per kWh for 5 years from the date of commissioning.

Another important provision of these regulations is that mandatory open access to the Licensee's transmission system and/or distribution system shall be provided to any person generation electricity through renewable sources.

Table 10.37 Renewable Energy Purchase Obligation for the state

Licensee	Purchase obligation	
	2006-07	2007-08
WBSEB	1.9%	3.8%
CESC Ltd.	1.02%	2.03%
The Durgapur Projects Ltd.	0.72%	1.4%
DPSC Ltd.	0.43%	0.95%

Source: WBERC Cogeneration & generation of electricity from Renewable Sources of energy Regulations 2006

Category wise average tariff

Table 10.38 shows the category-wise sales, revenue and average realization from tariffs for FY 2003-04, FY 2004-05 and FY 2005-06.

Table 10.38 Category wise average tariff in FY 2004-05 and FY 2005-06

Category	2003-04			2004-05			2005-06		
	Sales	Revenue	Average realization	Sales	Revenue	Average realization	Sales	Revenue	Average realization
	MU	Rs. Crore	Rs./ unit	MU	Rs. Crore	Rs./ unit	MU	Rs. Crore	Rs./ unit
Domestic	3039.47	751.59	2.47	3128	825.82	2.64	3502.46	934.53	2.67
Commercial	1123.67	448.83	3.99	1158.79	491.42	4.24	1278.41	568.36	4.45
Public Lighting	76.41	14.07	1.84	82.39	14.48	1.76	83	15.64	1.88
Agricultural	770	75.4	0.98	814.59	88.06	1.08	894.57	134.26	1.50
PW works	145.55	46.15	3.17	140.29	47.81	3.41	152.53	48.64	3.19
Industrial	2986.56	1242.08	4.16	3581.47	1451.25	4.05	4064.82	1657.34	4.08
Railway Traction	600.04	257.05	4.28	602.62	257.66	4.28	617.71	261.76	4.24
Bulk Supply	987.7	312.04	3.16	868.64	179.17	2.06	939.97	240.83	2.56
Outside supply	45.99	16.31	3.55	72.525	23.77	3.28	96.265	24.49	2.54
Export	3124	655.2	2.10	3098.88	688.19	2.22	3097.23	938.13	3.03
Total	12900	3818.72	2.96	13549	3355.67	2.48	14727	3861.36	2.62

Source: Annual accounts of WBSEB for FY 2003-04 to 2005-06

As observed from the above table, the average realization from some of the consumer categories has increased over time, while some other category of consumers have shown a declining trend in the average realization. However, one striking feature that is demonstrated from the above trends is that the average realization from industrial and railway traction consumers is on

the higher side, of the order of Rs.4 per unit. Figure 10.21 highlights the trend in tariff for selected consumer categories.

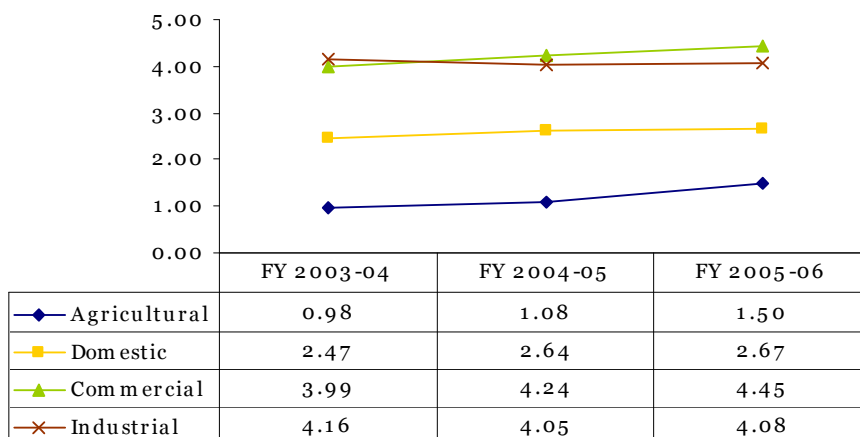


Figure 10.21 Tariff trends (Rs./ unit) for select consumer categories

Source: Annual accounts of WBSEB for FY 2003-04 to 2005-06

Cross subsidy

The Commission in its orders has recognised the need for reduction of cross-subsidy and hence tariff rationalization. Further, the Board has also taken several initiatives on account of the directives issued by the Commission in its tariff order for FY 2005-06 and has made some attempts towards rationalizing the existing tariff structure.

Table 10.39 The changes in cost recovery for various consumer categories for FY 2003-04, FY 2004-05 and FY 2005-06 (based on actual data)

Category	2003-04			2004-05			2005-06		
	Average realization	Average Cost	AR/AC	Average realization	Average Cost	AR/AC	Average realization	Average Cost	AR/AC
	Rs./ unit	Rs./ unit	Rs./ unit	Rs./ unit	Rs./ unit	Rs./ unit	Rs./ unit	Rs./ unit	Rs./ unit
Domestic	2.47	3.02	82%	2.64	3.05	87%	2.67	3.33	80%
Commercial	3.99	3.02	132%	4.24	3.05	139%	4.45	3.33	134%
Public	1.84	3.02	61%	1.76	3.05	58%	1.88	3.33	57%
Lighting									
Agricultural	0.98	3.02	32%	1.08	3.05	35%	1.50	3.33	45%
PW works	3.17	3.02	105%	3.41	3.05	112%	3.19	3.33	96%
Industrial	4.16	3.02	138%	4.05	3.05	133%	4.08	3.33	123%
Railway	4.28	3.02	142%	4.28	3.05	140%	4.24	3.33	127%
Traction									
Bulk Supply	3.16	3.02	105%	2.06	3.05	68%	2.56	3.33	77%
Export	2.10	3.02	70%	2.22	3.05	73%	3.03	3.33	91%
Total	2.96	3.02	98%	2.48	3.05	81%	2.62	3.33	79%

Source: Actual data from Annual audited accounts of WBSEB for FY 2003-04 and 2004-05 and Provisional Account of FY 2005-06

As observed in table 10.39, agriculture, public lighting and domestic categories of consumers are highly subsidized with cost recovery from for instance agriculture, being as low as 45% in FY 2005-06. On the other hand, categories like industry, commercial and railway traction are cross-subsidizing categories with cost recovery from, for instance, the commercial category being as high as 134%. The table also highlights that the overall cost recovery has declined from 98% in FY 2003-04 to 79% in FY 2005-06.

An interesting feature that emerges from the above table is that although the cost recovery from the cross-subsidizing categories such as industrial, railway traction and bulk supply has been decreasing over the past three years, the cost recovery from the categories of domestic, commercial and agricultural consumers has improved during this period. This may be because 100% metering scheme has been taken up by the Board in FY 2003-04 and metering has been completed at such station upto 11 KV feeder. Furthermore, as observed in table 10.15, the status of consumer metering achieved in FY 2004-05 and FY 2005-06 was 97% and 99% respectively.

Convergence index (CI)

Figure 10.22 indicates the trend in CI for West Bengal from FY 2003-04 to FY 2005-06. Since the data on consumer category-wise revenue for each of the three years was neither published by the Commission in its tariff orders for FY 2003-04 to FY 2005-06 nor available in the Board's tariff petitions, actual data for category-wise revenue and category-wise sales has been used for the purpose of computing CI for FY 2003-04 to FY 2005-06.

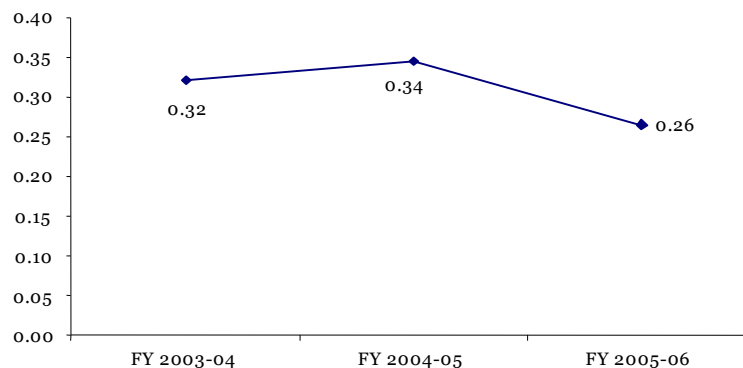


Figure 10.22 Trend in convergence index over the years

Source: Annual accounts of WBSEB for FY 2003-04 to 2005-06

It is observed that the CI marginally increased from FY 2003-04 to FY 2004-05, indicating an increase in the level of cross-subsidy. Although the CI showed a 23% improvement from FY 2004-05 to FY 2005-06, this need not necessarily indicate a decrease in the level of cross subsidy. This is because, although the cost recovery from the cross-subsidizing categories of industrial and bulk supply have reduced over the years, the cost recovery from the export category has improved substantially from 70% in FY 2003-04 to 91% in FY 2005-06. Hence the fall in CI over the years may indicate revenue realization from the export category to a larger extent rather than that of the cross-subsidizing categories.

Subsidy support from government

In the tariff petitions for FY 2003-04 and FY 2004-05, the Board had submitted that no amount of subsidy had been received from the Government of West Bengal. The Commission in its tariff order indicated that the Board had not adequately explained the reasons for not taking into account subsidy, especially for rural electrification, that they are entitled to as per policy. The Commission also noted that the Board had to recover Rs.1251 Crore towards approved rural electrification subsidy from the Government as per its accounts, for earlier years upto 31st March 2003. However, the Commission mentioned that it would not like to include any amount towards subsidy unless there was a commitment from the Government. The Commission further directed the Board to submit details of the subsidy that it had received with regard to the Singur Haripal society, which was not disclosed in the tariff petitions for FY 2003-04 and FY 2004-05.

Although in FY 2005-06, neither did the Board submit any details regarding subsidy nor did the Commission mention anything regarding subsidy in its tariff order for the year, during discussion with the Board and the Commission, it was mentioned that the Government of West Bengal had given a subsidy to the tune of Rs.19.96 Crore for agricultural un-metered consumers during FY 2005-06, in advance.

Revenue gap

The Commission issued a combined tariff order for FY 2002-03, FY 2003-04 and FY 2004-05. While scrutinizing the petitions of the board for the three years, the Commission observed that the Board had not submitted complete documents/information/data and figures during these three years. The Commission, therefore, decided that as an adhoc measure, an amount equal to 10% of the gross total of fixed costs, including the return of the revenue requirement for FY 2004-05, would be withheld which would only be released at the discretion of the Commission in one or suitable instalments

after it was satisfied that the Board had started taking adequate steps in the right directions, in this regard. The Commission, therefore, withheld Rs.372.98 Crore provisionally from the revenue requirement shortfall of the earlier years of FY 2002-03 and FY 2003-04.

The amounts approved by the Commission to be recovered by WBSEB through the tariff for FY 2004-05, including the amounts carried over from the earlier two years and the average cost of supply for FY 2004-05, is summarized below:

Table 10.40 Particulars of amounts approved by WBSEB to be recovered from the Board

Sl. No.	Particulars	
(a)	Revenue requirements for 2002-03	Rs.3222.69 Crore
	Saleable units during 2002-03	9839.56 MU
	Tariff realized / realizable on average cost of supply of 270 paise / Kwh (9839.56 MU x 270 paise / Kwh)	Rs.2656.68 Crore
	(i) Net balance realisable	Rs.566.01 Crore
(b)	Revenue requirements for 2003-04	Rs.3605.97 Crore
	Saleable units during 2003-04	10550 MU
	Tariff realized / realizable on average cost of supply of 320 paise / Kwh including 52 paise / Kwh of interim Tariff excluding on certain supplies (10550 MU x 320 paise / Kwh)	Rs.3376 Crore
	(ii) Net balance realisable	Rs.229.97 Crore
(c)	Shortfall of 2002-03 and 2003-04 to be recovered during 2004-05(i+ii)	Rs.795.97 Crore
(d)	Amount withheld	Rs.372.98 Crore
(e)	Balance realizable	Rs.422.99 Crore
(f)	Revenue requirements for 2004-05	Rs.2557.26 Crore
	Total revenue recoverable from own consumers in 2004-05	Rs.2980.25 Crore
	Saleable units to own consumers during 2004-05	9294.57 MU
	Average Tariff	320.60 paise / Kwh

Source: Combined Tariff Order for WBSEB for FY 2002-03, 2003-04 and 2004-05

In FY 2005-06, the Board projected a total expenditure of Rs.48.65 Crore and the revenue requirement from sale of power to its own consumers as Rs.34.77 Crore. Since at the existing tariff the Board could earn Rs.31.45 Crore, it sought to obtain additional revenue of Rs.3331.11 Crore. It proposed that a sum of Rs.157.73 Crore to be realized through a hike in tariffs. It also submitted that the rest of the amount, i.e. Rs. 173.38 Crore might be kept as a regulatory asset in order to avoid any tariff shock to its consumers. The Commission on adjusting for non-tariff income of Rs.111.30 Crore, disallowing the projected fixed cost of the Teesta hydel project of Rs.21.72 Crore and unscheduled interchange charges of Rs.97.12 Crore, approved an amount recoverable from the Board's own customers at

Rs.3870.18 Crore and an average cost of supply of Rs.3.26/kWh.

Electricity duty

Details of the charges collected by way of electricity duty by the Board for FY 2003-04, FY 2004-05 and FY 2005-06, is given in Table 10.41:

Table 10.41 Electricity Duty collected by WBSEB over the years (Source: Information provided by WBERC in December 2006)

Year	Electricity Duty Collected (Rs Crore)
FY 2003-04	130.9
FY 2004-05	157.9
FY 2005-06	197.5

Source: Written information provided by WBERC in December 2006

Governance

Public participation

In order to undertake public consultation and solicit views of various stakeholders on the petition filed by the WBSEB, the Commission after the acceptance of petition approves a public notice that is published in English and Bengali dailies. In addition, the copies of the petition are made available to the public at a reasonable rate and the documents are posted on the website of the Commission.

Table 10.42 Level of public participation

Year	Time given for filing comments /objections	No. of written objections	No. of participants
2003-04	30 days	53	16
2004-05	30 days	77	18
2005-06	30 days	22	22

Source: Compiled from tariff orders of WBSEB for FY 2003-04 to FY 2005-06

The major objections have been from the industrial consumers, associations, chambers of commerce and some from domestic consumers.

In FY 2003-04 and FY 2004-05, the number of stakeholders who participated in the public hearing organized by the Commission, were limited to 16 and 18 in FY 2003-04 and FY 2004-05, respectively. In FY 2005-06, the number of objections on WBSEB's petition had fallen to 22.

Timeliness of tariff orders

In finalization of the tariff orders for various years, the Commission has considered written objections and comments

by various stakeholders, written and oral submissions of the WBSEB and comments received during the public hearings.

The Commission issued a combined tariff order for FY 2002-03, FY 2003-04 and FY 2004-05. Since the Board had submitted three different petitions for FY 2002-03, FY 2003-04 and FY 2004-05, the Commission held separate public hearings for the three petitions on November 26-27, 2002, March 10-12, 2003 and March 2004, respectively.

As per section 43 of the Conduct of Business Regulations framed by WBERC, utilities are required to provide to the Commission, the details of its calculations for the ensuing financial year of the expected aggregated revenue from charges based on current tariffs approved by the Commission, between December 15-31 every year.

In FY 2005-06, as per Regulation 3.2 of the West Bengal Electricity Regulatory Commission (Tariff) Regulation, 2003, the Board was required to file the tariff petition to the Commission at least 4 months prior to the date from which the tariff was proposed to be set. However, the Board submitted to the Commission that on account of data collection of actual figures upto September 2004 and with the annual festive season falling in between, there was a delay in submitting the petition. The Commission proceeded to accept the petition and advised the Board to submit its tariff petitions in future, punctually.

Table 10.43 indicates the timeliness of various tariff orders issued by the WBERC.

Table 10.43 Timeliness of tariff orders

Year	Date of filing of petition	Date of acceptance of petition	Date of Issuance of Order	Days from filing to acceptance	Days from acceptance to issuance
2003-04					
2004-05	30-Dec-03	28-Jan-04	9-Jun-04*	29 days	121 days
2005-06	14-Dec-04	22-Dec-04	30-Mar-05	8 days	96 days

*Combined Tariff Order issued by WBERC for FY 2002-03, 2003-04 and 2004-05

Source: Tariff Orders for WBSEB, FY 2003-04 to 2005-06

Consumer advocacy and redressal mechanism

The WBERC notified the regulations for “Guidelines for Establishment of Forum for Redressal of Grievances of Consumer and Ombudsman” on 23rd September 2003. In accordance with these regulations, WBSEB has constituted a 3-Tier forum for redressal of consumers’ grievances. The *Tier-1* of the forum for redressal of Grievances has been constituted at the office of each Circle Manager at Distribution Circle headed by the Divisional Engineer/Superintending Engineer

(Electrical) attached with the Distribution Circle Office and designated as Circle Grievance Redressal Officer (CGRO). In case the consumer is not satisfied with the outcome of his complaint at Tier-1 he may approach to *Tier-2* with all the related correspondences of Tier-1.

The Tier-2 of the Forum for Redressal of Grievances has been constituted at the Distribution Zonal Office headed by one Superintending Engineer (Electrical) and designated as Zonal Grievance Redressal Officer (ZGRO). In case the consumer is not satisfied with redressal at Tier-2, he may approach to *Tier-3* with all related correspondence with Tier-1 and Tier-2 and the reply of the complaint shall be given within seven (7) days of the receipt of the grievance. The Tier-3 of the Forum for Redressal of Grievances has been constituted at the Corporate Head Quarter at Vidyut Bhavan headed by the Chief Engineer (Corporate) and designated as Principal Grievance Redressal Officer (PGRO).

Nature of complaints received by this forum includes conversion of phase of supply, supply interruption, voltage fluctuation, billing problems etc.

A consumer is required to approach at least one Grievance Redressal Officer or one Central Grievance Redressal Officer before he can represent his case to the Ombudsman. If a consumer is not satisfied with an order from any Grievance Redressal Officer, as aforesaid, or if he does not receive any order from the Grievance Redressal Officer to whom he has approached at the first instance seeking redressal of his grievance (s) within 60 (sixty) days from the date of lodging of his grievances, he may submit a written representation to the Ombudsman for the purpose of settlement of his grievances/complaints.

The Commission has appointed and designated one Ombudsman for all the distribution licensees. Every distribution licensee has established a forum for redressal of consumer grievances. The forum consisted of Grievance Redressal Officers as has been considered necessary at the rate of at least one such officer at each sub-district/district/region/zone and at least one Central Grievance Redressal Officer at the corporate head quarters level.

Since its inception in June 2004, the Office of the Ombudsman has received 397 cases out of which 312 have been disposed of.

Open access

The Commission issued the phasing of open access in distribution/sale regulations in June 2004. It notified the terms and conditions of Open Access regulation (including the methodology for computing cross-subsidy surcharge and additional surcharge) in June 2005. This methodology is given below:

- Cross-subsidy surcharge is to be computed as the difference between tariff applicable for the category of consumers being allowed open access and the cost avoided (per unit) by the licensee in this regard.
- Avoided cost is to be computed as under:
 - Weighted Average of
 - i) Unit cost of pooled power purchase variable cost*
 - ii) Own generation fuel cost

(sent Out) if any per unit	+	Wheeling charges as applicable to the relevant Open Access case
100-T&D loss in percentage as allocable for the relevant Open Access case		

*Where the power purchase cost is in single part the separation of fixed cost and variable cost will be as per the decision of the commission.

The cross-subsidy surcharge amount for different consumer categories has not yet been notified by the Commission in its tariff orders, till date.

As per the Phasing for Open Access in Distribution/Sale of Electricity Regulation 2004, phasing of open access for consumers shall be based on the following schedule.

Table 10.44 Schedule of phasing of open access

Phase	Category of Consumers	Time-frame from which Open Access is/ has been allowed
Phase I	Power from Co-generation and Non-conventional source of energy	1 st April 2006
Phase II	Consumers with connected load of 10MW and exceeding 10MW in single premises	1 st April 2007
Phase III	Consumers with connected load of 5MW and exceeding 5MW in single premises	1 st April 2008
Phase IV	Consumers with connected load exceeding 1MW in single premises	1 st January 2009

Source: WBERC Phasing of open access in distribution/ sale Regulations, June 2004

Till date, out of 4 applications received so far, the Commission has granted permission for open access to 3 customers viz. Electro Steel, HINDALCO and Bhusan Industries Ltd.

Presently, there is no open access is taking place in the state.

Appeals against orders

Upto FY 2005-06, five (5) cases have been filed in the Supreme Court, out of which two (2) cases have been disposed of. Similarly, the WBERC has indicated that fifty five (55) cases have been filed in the High Court at Kolkata, out of which twenty six (26) have been disposed of. The Commission also mentioned that eight (8) cases have been filed to the Appellate Tribunal out of which six have been disposed of.

Staffing

Apart from the Chairperson, two members and the Secretary, the Commission has the following staff at its office: One Ombudsman, One Adviser (Engineering), One Joint Adviser (Finance), One Director (Finance), One Director (Engineering), One Deputy Director (Tariff-Engineering) and One Accounts Officer. The Commission has indicated that it is not presently facing any crisis with regard to number of employees. Moreover, the Commission has mentioned that as a policy of the WBERC, most work is to be done by the internal staff of the Commission and it tries not to involve external consultants at any stage.

Table 10.45 gives the sanctioned posts and number of employees under each category.

Table 10.45 Total sanctioned officers/staff

Sl. No.	Name of the Post	No. of posts
1.	Secretary	1
2.	Advisor (Engineering)	1
3.	Advisor (Finance)	1
4.	Advisor (Law)	1
5.	Jt. Advisor (Engineering)	2
6.	Jt. Advisor (Finance)	1
7.	Director (Engineering)	2
8.	Director (Finance)	1
9.	Director (Law)	1
10.	Dy. Director (Engineering)	2
11.	Dy. Director (Finance)	2
12.	Document Officer	1
13.	Assistant Director(Accounts)/Accounts Officer	1
14.	Asstt. Director (System)	1
15.	Assistant Director (Administration)	1
16.	Public Relations Officer	1
17.	Private Secretary	3
18.	Personal Assistant	3
19.	Accountant	1
20.	Senior Assistant	7

21.	Assistant	15
22.	Group D officials	8

Source: Information provided by WBERC in December 2006

Directives issued by WBERC and their compliance

In the tariff order for FY 2005-06, the WBERC has given several directives to the WBSEB. Table 10.46 shows the status of important directives as indicated in the petition submitted by WBSEB in FY 2006-07.

Table 10.46 Status of important directives given by WBERC (based on the compliance report submitted by WBSEB to WBERC)

No.	Summary of directives	Status based on WBSEB's reply
1.	Implementation of 100% metered supply at the Consumer's end	<p>The Board has submitted a detailed plan for implementation of 100% metered supply at the consumer's end to the Commission on 30/6/2005.</p> <p><i>a) HV & EHV Consumers</i></p> <p>All consumers receiving HV & EHV supply are provided with proper metering at their premises.</p> <p><i>b) L & MV Consumers</i></p> <p><i>i) Irrigation consumers receiving supply for STW or submersible pumps</i></p> <p>WBSEB has taken a massive programme for TOD metering arrangement to existing 98427 nos. STWs and Sub-mersible pump sets, for which WBSEB has undertaken a programme for installation of energy meters and allied works on 'Turn-key' basis. The entire work is expected to be completed by December, 2007.</p> <p><i>ii) Lokdeep / Kutirijyoti Consumers</i></p> <p>WBSEB is in the process of converting un-metered Lokdeep / Kutirijyoti connection to metered supply in phased manner. Out of 69770 nos. Lokdeep / Kutirijyoti consumers receiving un-metered supply, metering for 48656 nos. consumers will be completed by March, 2006 and metering installation of balance 21114 nos. consumers will be completed by September, 2006.</p> <p><i>iii) Domestic Consumers connected with MCB</i></p> <p>Rural Domestic consumers who were connected with MCB are being converted into metered connection in phases. As on 30/08/2005, 415 nos. of consumers connected with MCB are lying un-metered. Board has taken a programme to complete metering to these consumer's premises within 31/03/2006.</p>
2.	Introduction of TOD Tariff to Agricultural Consumers on an optional basis Till dedicated feeders for effecting supply to agricultural consumers for irrigation purposes are put in place, supply to such consumers who have already received metered supply and those who currently receive un-metered supply, but may have meters installed in course of 2005-06, may be given an option to	<p>Board through Press Notification dated 30/08/2005 through leading dailies intimated this direction of the Commission. But till date, no option is reported to have been received from Agricultural Consumers opting for TOD Tariff. Till such time metering arrangement is completed, WBSEB will provide TOD meters to those Agricultural consumers opting to receive supply on TOD Tariff for which they are to construct meter rooms as per WBSEB's Specification. Existing meter rent applicable for metered Agricultural connections will be realized in such metered connections, till such time rent applicable for TOD meter for Agricultural connection is approved by the Commission. After implementation of 100% metering for STW & Sub-mersible Pump Sets, WBSEB may propose the Commission for implementation of TOD Tariff as mandatory for Agricultural consumers.</p>

No.	Summary of directives	Status based on WBSEB's reply												
	receive to receive supply on TOD basis.													
3.	Introduction of TOD tariff for HT and EHT Commercial and Public Utility Services on optional basis	It is obvious that Commercial and Public Utility Services, receiving supply at HV & EHV, not consuming electricity during off-peak period, but consuming during peak period, will not be interested to opt for TOD Tariff. At present, the following HT & EHT Commercial / Public Utility Services are receiving power supply from WBSEB under TOD tariff.												
		<table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Name of the Consumer</th> <th>Applicable Tariff</th> <th>Contract Demand (KVA)</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>M/s. CCAP Limited</td> <td>E(ct)</td> <td>350</td> </tr> <tr> <td>2.</td> <td>Kariwala Industries Limited</td> <td>E(ct)</td> <td>315</td> </tr> </tbody> </table>	Sl. No.	Name of the Consumer	Applicable Tariff	Contract Demand (KVA)	1.	M/s. CCAP Limited	E(ct)	350	2.	Kariwala Industries Limited	E(ct)	315
Sl. No.	Name of the Consumer	Applicable Tariff	Contract Demand (KVA)											
1.	M/s. CCAP Limited	E(ct)	350											
2.	Kariwala Industries Limited	E(ct)	315											
4.	WBSEB shall submit a scheme of introducing a system of Pre-paid Meters to the Commission within 6 months. This scheme should form a part of the next tariff petition	In this respect, a scheme for introducing a system of pre-paid metering stands submitted before the Hon'ble Commission on 20/07/2005, copy of which is enclosed. Through the said report Board sought for kind clearance of the Hon'ble Commission towards implementation of the Pilot Project for Pre-paid Energy Meter at New Town area through New Town Electric Supply Company Limited, a franchisee of WBSEB. The Pilot Project for installation of Pre-paid meters is presently under execution by the said NTESEB. A detailed report containing the procedural steps towards implementation of the project is being submitted along with the Tariff Proposal for the year 2006-07.												
5.	WBSEB shall put in place accredited independent third-party meter testing arrangement in all the districts under its licensed area and prepare ground for allowing the consumers to purchase their own meters duly tested and certified by the third party testing agency	Installation of accurate meter at consumer's premises is essential in order to record actual consumption, thereby reducing the ATC Loss of the licensee. As such, the meters, which are proposed to be purchased by the consumers, should be tested at the appropriate laboratory having proven reputation. In the Electricity Act, 1910 (now repealed) the licensees and Electrical Inspector were empowered for testing of meters. However, as such type of independent third party meter testing arrangement in all the districts do not come into operation, there may not be any objection in case the meter purchased by the consumers are tested by the National Test House / Electrical Inspector.												
6.	Introduction of ABT in the State Sector	The said report stand submitted to the Hon'ble Commission on 10/08/2005, a copy of the said report is enclosed. WBSEB has proposed to introduce ABT in the State Sector in respect of the following bulk exchanges : i. Purchase of power by WBSEB from all the four number Thermal Power Stations of WBPDCCL. ii. Purchase of power by CESC from WBSEB. iii. Purchase of power by WBSEB from DPL. iv. EHV Bulk Consumers seeking Open Access. In order to facilitate implementation of ABT in the State Sector, up-gradation of SLDC is essential. WBSEB has already arranged for training of existing operational Engineers in ERLDC. Revision of the existing Staff set up of SLDC is also under consideration. A proposal has also been initiated to convene a meeting where all Generators, STU, DISCOMS may participate and discuss the issue so that a time frame for replacement of CTs, PTs, breakers (if required) and commissioning of SEMs may be fixed up to facilitate implementation of ABT.												
7.	Purchase of Power from Renewable and Non-conventional source of Energy	Presently, WBSEB has been purchasing power generated by WBREDA at Frejergunj through Wind Mill. In addition, recently a small Hydel Project, namely, Mongpu-Kalikhola Project having installed capacity of 3x1MW has been put into operation during the year 2004-												

No.	Summary of directives	<p>Status based on WBSEB's reply</p> <p>05. Now, a number of entrepreneurs have come up with the proposal for development of small hydel projects in the district of Darjeeling and they proposed to sale the power generated from those projects direct to WBSEB. WBSEB has already issued in-principle clearance for purchase of such green power subject to finalisation of the evacuation system, Terms & Conditions and the Tariff that may be fixed by the Hon'ble Commission. Besides, a number of small Bio-mass based plant have also proposed to set up their unit in the different parts of the State. WBSEB is in a position to issue such in-principle clearance to those entrepreneurs in case they approach WBSEB to sale entire power generated from their power plant.</p> <p>Besides, Board has already executed Agreement and finalized the evacuation scheme for purchase of power generated at Lodhama, a small hydel project being constructed by M/s. Nippon Power Limited in the district of Darjeeling.</p>
8.	Periodic Energy Audits	<p>In this context, the following activities have been undertaken by WBSEB:</p> <ol style="list-style-type: none"> 1. WBSEB approached its consumers as well as approached to Govt. Buildings for conducting energy audit taking into account of the Energy Conservation Act, 2001 during the period 2004-05. 2. WBSEB being designated agency for implementation of the Energy Conservation Act, 2001 requested towards awareness of conducting energy audit to different designated consumers under different licensees working within the State of West Bengal. 3. A few designated consumers have already submitted energy audit report and the same are under scrutiny. <p>The following programmes have been undertaken by WBSEB :</p> <ol style="list-style-type: none"> (a) Being the designated agency towards implementation of the Energy Conservation Act, 2001, WBSEB have already constituted a State Level Energy Conservation Committee taking one member from the licensees working within the State of West Bengal while WBSEB have 5 nos. of member. (b) In addition to above, WBSEB have constituted an In-house Committee taking one representative from the members of different associations as well as Unions while Chairman of the Committee is in the rank of Addl. Chief Engineer under Energy Management Cell, WBSEB. (c) State Level Energy Conservation Committee have already made accredited energy auditors those have office address in West Bengal in order to assess their observations towards conducting energy audit. (d) Energy Efficient Tubes were installed at WBSEB's Kona 33/11 KV Sub-station and saving to the extent of .042 MU is observed per annum while Rs.1.33 lakh is being saved per year. Moreover, actions are being taken towards installation of energy efficient tubes in switchyard lighting in 33/11 KV Sub-stations at Tamluk, Purulia & Birbhum.
9.	Awareness Programme	<p>The Human Resource Development Department has designed the Training Modules and the Training Calender for the year 2005-06 covering all the activities of the Board to train employees right from the grass root level to the management level. Special emphasis has been given to train the technical and non-technical personnel for providing best Customer Services and Customer Satisfaction thereby reducing Consumer Grievances.</p> <p>To apprise the employees regarding the reforms programme undertaken by WBSEB, a course on 'Reforms in Power Utilities' has been included. Of course reform requires changes of 'Mind Set' of all concerned. As such, earlier, an introduction on 'The Change in Mind Set' to adopt with the change in Power Sector has been introduced in all training programmes with reference to the Electricity Act, 2003. Special emphasis is being given in all the training courses to educate the employees about the Regulations framed by the Hon'ble</p>

No.	Summary of directives	Status based on WBSEB's reply Commission.
10.	Plan for reduction of T&D Loss	<p>Board has taken up 100% metering scheme and completed metering at the Sub-Station up to 11 KV feeder. Distribution Transformer (DTR) Metering has been taken up by the Board in phased manner. In the first phase Tender Notice has been floated for installation of all the DTR Metering in the districts of North 24-Parganas and Hooghly. Board has already taken up a massive programme for installation of TOD Meters in respect of all Agricultural consumers (STW and Sub-mersible Pump Sets) on Turnkey basis.</p> <p>For the purpose of reducing the overall ATC Loss, the activities of Security and Loss Prevention Wing (S&LP) have been strengthened and decentralised up to circle levels. Besides Corporate Wing, seventeen units at circle level have been created and started functioning w.e.f. August, 2004.</p> <p>In view of completion of 100% metering at sub-station up to 11KV, installation of proposed DTR Metering in phases and strengthening of the activities of Security and loss prevention (S&LP) wing, the ATC loss will ultimately be reduced to the accepted level.</p> <p>Board has introduced High Voltage Distribution Supply (HVDS) system primarily for power supply to irrigation/agricultural consumers directly from distribution sub-station through drawal of L.T. P.V.C. cable. For this purpose distribution sub-stations are being considered of capacity 10 KVA, 11/0.4 KV for every two STW consumers. This concept is also being followed in the massive rural electrification programme under implementation. By considering such system technical as well as commercial loss will be substantially reduced.</p> <p>In the first phase, implementation of GIS in WBSEB has been taken up under 63 Nos. Group Electric Supply. In the second phase, survey work for another 25 nos. Group Electric supply is scheduled to be taken up.</p> <p>Once this network documentation is completed the energy loss will be computed through application software CYMDIST, which already available in WBSEB. Voltage gradient will also be found out through this system. On the basis of load flow study through CYMDIST software 33KV & 11KV network will be planned properly to reduce technical loss.</p> <p>Board has already taken up R&M Work in the distribution wing under APDRP Scheme in different circles and district towns. APDRP Incentive for reduction of losses over the years received amounting to Rs.73.00 Crore for 2002-03 and Rs.303.00 Crore for 2003-04.</p>

Source: Tariff Order for WBSEB for FY 2005-06 and Compliance of Directives submitted by WBSEB along with their tariff petition for FY 2006-07

Power sector rating

As per the performance rating of the state power sector carried out at the instance of the Ministry of Power, GoI, West Bengal has been given the following ratings during FY 2003-04, FY 2004-05 and FY 2005-06.

Table 10.47 West Bengal power sector rating

	FY 2003-04	FY 2004-05	FY 2005-06
Rank	13	8	5
Score	35.88	44.60	46.24

Source: CRISIL-ICRA Power Sector Rating Report for 2003 to 2005

West Bengal moved up eight notches from 13th to 5th in FY 2005-06. The ranking report highlighted the following as the reasons for this:

1. Generation of cash profit in FY 2004-05 due to trading operations and reduction in T&D losses. The gap between ARR & ACS has reduced to 3 paisa for the year ended 2004-05.
2. Substantial improvement in ATC loss reduction (25.3% in 2004-05 Vs 33.3% in 2003-04) due to comprehensive energy audit, strict implementation of Anti-Theft laws and vigorous collection efforts.
3. Satisfactory progress against the targets laid out in Electricity Act, 2003 with respect to constitution of special courts, district level committees and designation of Assessing officers
4. Satisfactory completions of interface metering, though DTR metering project has been delayed.
5. Relatively high proportion of sales on metered basis compared to peers.
6. Modest improvement in most financial parameters as reflected by improving trend in receivables and debt service track record.

Regulations issued

Table 10.48 summarizes all the regulations that have been notified by the WBERC, till date.

Table 10.48 List of final regulations notified by WBERC

S. No.	Regulations	Date
1.	West Bengal Electricity Regulatory Commission (Phasing For Open Access in Distribution / Sale of Electricity) Regulations, 2006.	20 th July 2006
2.	West Bengal Electricity Regulatory Commission (Number, Nature and Categories of Other Employees and Salaries, Allowances and Other Conditions of Service of Secretary, Other Officers and Employees) Regulations, 2006.	4 th May 2006
3.	West Bengal Electricity Regulatory Commission (Cogeneration & generation of electricity from Renewable Sources of energy) Regulations, 2006	4 th May 2006
4.	West Bengal Electricity Regulatory Commission (Guidelines for Establishment of Forum for Redressal of Grievances of Consumers and Time and Manner of Dealing with such Grievances by the Ombudsman) Regulations, 2006	17 th January 2006
5.	West Bengal Electricity Regulatory Commission (West Bengal Electricity Grid Code) Regulations, 2006	12 th January 2006
6.	West Bengal Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2005	21 st November 2005
7.	West Bengal Electricity Regulatory Commission (Standards of Performance of Distribution Licensees Relating to Consumer Services) Regulations, 2005	18 th October 2005

S. No.	Regulations	Date
8.	West Bengal Electricity Regulatory Commission (Miscellaneous Provisions) Regulation, 2005	18 th October 2005
9.	West Bengal Electricity Regulatory Commission (Recovery of Expenditure for Providing New Connections) Regulation 2005	28 th September 2005
10.	West Bengal Electricity Regulatory Commission (Terms and Conditions for Open Access – Schedule of Charges, Fees & Formats for Open Access) Regulations, 2005	21 st September 2005
11.	West Bengal Electricity Regulatory Commission (Terms and Conditions for Open Access) Regulations, 2005	30 th June 2005
12.	West Bengal Electricity Regulatory Commission (Conduct of Business) First Amendment Regulations, 2004	12 th October 2004
13.	West Bengal Electricity Regulatory Commission (Tariff) Regulations, 2003	9 th June 2004
14.	West Bengal Electricity Regulatory Commission (Licensing and Conditions of Licence) Regulations, 2004	9 th June 2004
15.	West Bengal Electricity Regulatory Commission (Standards of Performance of Licensees Relating to Consumer Services) Regulation, 2003	9 th June 2004
16.	West Bengal Electricity Regulatory Commission (Phasing For Open Access in Distribution / Sale of Electricity) Regulation, 2004	9 th June 2004
17.	West Bengal Electricity Regulatory Commission (Number, Nature and Categories of Other Employees and Salaries, Allowances and Other Conditions of Service of Secretary, Other Officers and Employees) Regulations, 2004	23 rd March 2004
18.	West Bengal Electricity Regulatory Commission (Electricity Supply Code) Regulation, 2004	5 th February 2004
19.	West Bengal Electricity Regulatory Commission (Conduct of Business) Regulations, 2003	12 th November 2003
20.	West Bengal Electricity Regulatory Commission (Miscellaneous Provisions) Regulation, 2003	12 th November 2003
21.	West Bengal Electricity Regulatory Commission (Guidelines for Establishment of Forum for Redressal of Grievances of Consumer and Ombudsman) Regulation, 2003	23 rd September 2003
22.	This is a Notification constituting West Bengal State Advisory Committee in terms of section 87(1) of the Electricity Act, 2003	8 th August 2003

Status of annual accounts

The WBSEB has been publishing its annual accounts on time. The audited accounts till FY 2004-05 have already been published and the provisional accounts for FY 2005-06 is in the process of being audited and will soon be published.

Conclusion

- Reforms were initiated in West Bengal in 1999 with the establishment of the West Bengal Electricity Regulatory Commission.

- The WBSEB still operates as a vertically integrated utility with no unbundling/ corporatization. The state has indicated that the restructuring process shall be completed soon with no clear indication of the exact timeline.
- On analysing the sales and demand estimation of the Board and that approved by the Commission, a striking feature is that the amount of export of power proposed by the Board, outside the region, through the Power Trading Corporation has increased considerably over the past three years.
- This has an important bearing in the analysis of West Bengal as the average revenue realization of the Board from export of power to outside the region has increased from Rs.2.10/kWh in FY 2003-04 to Rs.3.03/kWh in FY 2005-06.
- Furthermore, on analysing the cross-subsidy in the state, it is seen that that the cost recovery from the category of export of power outside the state of West Bengal has increased gradually from 70% in FY 2003-04 to 91% in FY 2005-06, even though the total cost recovery from all consumer categories has fallen from 98% to 79% during the same period.
- It is important to highlight that the information/data submitted by the Board during FY 2003-04 and 2004-05 was very poor which was a major hindrance to the Commission while issuing the tariff orders for these years. The Commission in fact withheld a certain amount of the ARR proposed by the Board for FY 2002-03 to FY 2004-05 on account of inadequate data submission.
- During FY 2005-06 and 2006-07, the Board has improved its data submission through its tariff petitions. The Board also submitted the Compliance of Directives report with regard to the directives issued by the Commission in the tariff order for FY 2005-06, through its tariff petition submitted for FY 2006-07.
- Several new regulatory initiatives have been undertaken by WBERC especially in FY 2005-06. These include initiatives such as Multi-year tariff framework, demand side management initiatives such as introduction of Time of Day (TOD) tariff for the Board's Industrial consumers, in order to reduce the system demand during evening peak period, in terms of which the peak period energy charge is to be 50% more than the normal energy charge indicated in the tariff schedule. Initiatives for promotion of renewables such as framing of regulations on co-generation and generation of electricity from renewable sources of energy stipulating the minimum percentage of energy to be procured from

such sources by the distributing licensee for the year FY 2006-07 and FY 2007-08. Commission has also indicated the upper price cap for biomass, wind farm and small hydel project below 25 MW.

- The MYT framework that was detailed by WBERC in the draft tariff regulations dated 23rd October 2006 outlined specific parameters for which the trajectory would be set by the Commission. These include, station heat rate, plant load factor, availability factor, auxiliary consumption, oil consumption rate and combined technical losses and non-technical losses (T&D loss) of distribution and transmission licensee. These regulations interestingly indicate that any variation arising out of controllable factors shall be borne by the licensee or generating company. This would imply that any profit or loss that would accrue to the licensee on account of controllable factors would be absorbed by them. As a result of this provision, there is also no indication of the sharing mechanism for profits/ losses, in the regulations. The regulations clearly outline the Controllable and Uncontrollable factors. Employee cost has been considered as an uncontrollable factor.
- In terms of Consumer Advocacy and Redressal mechanism, the WBERC has framed regulations on guidelines for establishment of forum for redressal of grievances of consumers and time and manner of dealing with such grievances by the ombudsman. In accordance with these regulations, WBSEB has constituted a 3-Tier forum for redressal of consumers' grievances. Nature of complaints received by this forum includes conversion of phase of supply, supply interruption, voltage fluctuation, billing problems etc. The Commission has appointed and designated one Ombudsman for all the distribution licensees and since its inception in June 2004, the Office of the Ombudsman has received 397 cases out of which 312 have been disposed of.
- With regard to investments, although the Commission had issued the phasing of open access in distribution/ sale regulations in June 2004 and notified the terms and conditions of Open Access regulation (including the methodology for computing cross-subsidy surcharge and additional surcharge) in June 2005, till date, out of 4 applications received so far, the Commission has granted permission for open access to only 3 customers viz. Electro Steel, HINDALCO and Bhusan Industries Ltd. Furthermore, at present no open access is actually taking place in the state. Although the efforts of the Commission were commendable in terms of specifying the open access cross subsidy surcharge formula as the

difference between tariff applicable for the category of consumers being allowed open access and the cost avoided (per unit) by the licensee in this regard, which was in line with the formula specified in the Tariff Policy issued in January 2006, no open access surcharge order as yet been issued in the state.

- In terms of quality of power supply initiatives undertaken by the Board, it is seen that the Board has taken considerable efforts in this regard in terms of introducing pre-paid meters, establishing independent third party meter testing arrangements and so on towards improving the quality of power supplied.
- The Board has also completed 100% metering at the sub-station and feeder level upto 11 kV and the state has also achieved 99% consumer metering till date. Furthermore, remote metering of HT and industrial metering has also been started in the state.
- The T&D loss of the Board has improved from 36% in FY 2001-02 to 23% in FY 2006-07.
- As far as rural electrification is concerned, although 80% rural villages have been electrified, only 20% of the rural households have been electrified till date.