



**MONOPOLY TO COMPETITION IN INDIAN POWER SECTOR
AND ITS IMPACT ON UTILITIES**

Submitted By

GYAN PRAKASH GUPTA

ROLL NO. R100105020

GUIDED BY

MAINPAL BHOLA

LECTURER

UNIVERSITY OF PETROLEUM & ENERGY STUDIES

**A Dissertation report submitted in partial fulfillment of the
requirement for**

**Master of Business Administration (Power Management) of
University of Petroleum & Energy Studies, India**



**College of Management & Economics Studies
University of Petroleum & Energy Studies, India**

Gurgaon

ACKNOWLEDGEMENT

Thanks giving have been a ritual after the completion of project. I take this opportunity to express my deepest gratitude towards all those who aided me in completion of this dissertation.

I have no words to express my deep sense of gratitude to our Internal Guide Mr. Mainpal Bhola for his able guidance and support.

I am also thankful to our Program Director Mr. Avinash Bhardawaj for his help and guidance.

I also express my deepest regards for my external Guide Mr. S.K. Chatterjee, Assistant Secretary, CERC for his valuable support and visionary guidance which helped me in refining my concepts.

I also place on record my appreciation of the support provided by Ms. Meenu Mishra for her extreme support in completing this project.

I must thank our lecturer Mr. M.Yakoot who helped me to refine my topic of dissertation.

Last but not the least I am thankful to my University and associated lecturers who provided me the opportunity to complete my dissertation on this Topic.

DECLARATION

This is to certify that internship report on “**Monopoly to Competition in Indian Power Sector and its Impact on Utilities**” submitted to University of Petroleum & Energy Studies, Gurgaon, by “**Gyan Prakash Gupta**”, in partial fulfillment of the requirement for the award of degree of Masters of Business Administration (Power Management), is a bonafide work carried out by him in my supervision and guidance.



Mainpal Bhola

UPES, Gurgaon



Sushanta Chatterjee

Assistant Secretary

CERC, New Delhi

(in Individual capacity)

TABLE OF CONTENTS

Title	Page
Acknowledgement.....	ii
Declaration.....	iii
Table of Contents.....	iv
Acronyms.....	v
List of Tables.....	viii
List of Figures.....	ix
Executive Summary.....	x
Chapter1: Introduction	1
1.1. Overview.....	1
1.2 Background.....	4
Chapter 2 : Power Sector Reform.....	7
2.1. Introduction.....	7
2.2 Drivers of Power Market Reform.....	7
2.3 Market models for Reform.....	10
2.4 Objectives of power market reforms.....	14
2.5 Power Market Framework.....	18
Chapter 3 : Development of market in Power and Competition.....	19
3.1. Introduction.....	19
3.2. Drivers of Competition.....	22
Chapter 4 : Mechanisms and initiatives fuelling competition.....	39
Chapter 5 : Analysis.....	52
5.1 Present Status of mechanisms and initiatives.....	52
5.2 Challenges and Issues.....	60
Chapter 6 :Measures and Recommendations.....	66
Chapter 7. Conclusion.....	71
Bibliography.....	73
Annexures.....	77

ACRONYMS

ABT: Availability Based Tariff
AERC: Assam Electricity Regulatory Commission
BOO: Build Own Operate
BOT: Build Own Transfer
CEA: Central Electricity Authority
CEE: Central and Eastern Europe
CERC: Central Electricity Regulatory Commission
CGR: Consumer Redressal Forum
CPI: Consume Price Index
CPP: Captive Power Plant
CSERC: Chattisgarh State Electricity Regulatory Commission
DISCO: Distribution Company
DPR: Detailed Project Report
EA: Electricity Act
EPC: Engineering Procurement and Construction
FC: Fixed Charges
FSU: Former Soviet Union
GDP: Gross Domestic Product
GENCO: Generation Company
GERC: Gujarat Electricity Regulatory Commission
GNP: Gross National Product
GOI: Government of India
HT: High Tension
HVDS: High Voltage Direct Current System
IFC: International Finance Corporation
IMF: International Monetary Fund
IPP: Independent Power Producer
IT: Information Technology
J&KERC: Jammu & Kashmir Electricity Regulatory Commission

JSERC: Jharkhand State Electricity Regulatory Commission
KEREC: Kerala Electricity Regulatory Commission
KSERC: Karnataka State Electricity Regulatory Commission
KWh: Kilo-Watt hour
LT/ HT: Low Tension/ High Tension
MBMS: Multi Buyer Multi Seller
MDB: Multi-Lateral Development Bank
MERC: Maharashtra Electricity Regulatory Commission
MPERC: Madhya Pradesh Electricity Regulatory Commission
MPSEB: Madhya Pradesh State Electricity Board
MoE&F: Ministry of Environment & Forestry
MOU: Memorandum of Understanding
MSEB: Maharashtra State Electricity Board
MSEDCL: Maharashtra State Electricity Development Corporation Limited
MVA: Mega Volt Ampere
MU: Million Units
MW: Mega Watts
MYT: Multi Year Tariff
NEP: National Electricity Policy
NLC: Neyveli Lignite Corporation
NLDC; National Load Dispatch Centre
OED: Operation's Evaluation Department
OERC: Orissa Electricity Regulatory Commission
O&M: Operation & Maintenance
PLF: Plant Load Factor
PPA: Power Purchase Agreement
PSEB: Punjab State Electricity Board
REL: Reliance Energy Limited
RERC: Rajasthan Electricity Regulatory Commission
R&M: Renovation & Modernisation

R&R: Relocation & Resettlement
RLDC: Regional Load Dispatch Centre
ROE: Return on Equity
RSTO: Retail Supply Tariff Order
SAPP: South Africa Power Pool
SCADA: Supervisory Control and Data Acquisition System
SERC: State Electricity Regulatory Commission
SIEPAC: Central American Country Interconnection System
STU: State Transmission Utility
T&D: Transmission & Distribution
TPC: Tata Power Corporation
TNERC: Tamil Nadu Electricity Regulatory Commission
TOD: Time of Day
UERC: Uttaranchal Electricity Regulatory Commission
UI: Unscheduled Interchange
UK: United Kingdom
ULDC: Uniform Load Dispatch Centre
UPERC: Uttar Pradesh Electricity Regulatory Commission
WB: World Bank
WBERC: West Bengal Electricity Regulatory Commission

LIST OF TABLES AND ILLUSTRATIONS

Sr. No.	Table Name	Page
1	Total no. of inter-state trading licenses	96
2	Licensees undertaking trading in electricity	97
3	Major Reason for Slippage for Capacity Addition in X plan	98
4	Target vs Achievement during VIIth and IXth plans	99
5	10th plan Capacity Addition Target-Sector wise	99
6	Open Access Regulations Notified by SERC's	100
7	Transmission, Wheeling and surcharges for Open Access as determined by the SERC's	101
8	Status of Open Access cases in the country	103
9	Return on Equity	104
10	Phasing Details for granting Open Access by SERC's	105
11	Depreciation Rates	112
12	Implementation of Intra-state ABT	113
13	TOD Tariff	114
14	Renewable Source of Energy	115
15	Status of Determination of Open Access Surcharge	117
16	Harnessing of Surplus Captive Generation	118
17	GRID Code	123
18	Technology Up-gradation	124
19	Open Access Transmission Charges & Distribution networks charges	125
20	Time bound program on AT&C losses	127
21	Metering Plans	128
22	Implementation of HVDS, SCADA & Data base management	129
23	Norms for Standard of Performance	132
24	Setting up of CGR Forum & Ombudsman	134
25	Capacity Building for Consumer Groups	134
26	Regulatory Compliance of SERCs under EA'03	135
27	Score Card to judge level of competition achieved in States of India	137

LIST OF FIGURES

Sr. No.	Figure Name	Page
1	Drivers of Market Reforms	9
2	Power Market Models – Monopoly	11
3	Power Market Models – Single Buyer	12
4	Power Market Models – Wholesale Competition	13
5	Power Market Models – Retail Competition	13
6	Power Market Model Transitioning	21
7	Trend Towards Increasing Financing Complexity	27
8	Strategies for Mobilizing Foreign Vs Domestic Capital	29
9	Power Financing Models in Emerging Markets	29

EXECUTIVE SUMMARY

Several countries, including India, are introducing competition into their electricity markets. This is a challenging process. Promoting effective and sustainable competition requires action on a number of related issues and an overhaul of traditional market structures and regulatory frameworks

The present Reform experience in diverse jurisdictions in India so far highlights a converging trend towards introducing consumer choice of electricity supplier as a fundamental pillar of effective reform. This means stimulating competition not only in generation, but also in electricity trading and supply as a service to consumers

And this *Power sector development requires coordinated progress on all four legs of the development process, i.e., political, macro-economic, sector, and financial*. The failures in reform and private investment mobilization highlight the fact that electric power, as a social good and key input to economic development, is inextricably tied to larger political, macro-economic, and financial conditions that need to develop in parallel to enhance the potential for reform.

This report is based on analysis of information obtained from 19 states. In addition, this report was informed by a concise body of literature and information in chapters and Annexure that has analyzed the subject of power sector reform and creation of competitive environment. The objective of this report is to assist power sector policymakers in advancing power sector reforms in a way that successfully depicts that competition has ensued in this

sector and respective components needed for creation of competitive environment along with their present status quo state-wise in India.

The report discusses various drivers for power sector reforms and types of market models for reform. The next chapter discusses how to develop market in Power and promote Competition and various components like regulations, financing mechanism, capacity augmentation followed by the analysis of these components.

The recommendations reflect the shortcomings which are to be addressed and resolved for creation of amiable competitive environment in various states. The focus is on both near and longer-term actions that government, regulators, utilities etc, can take in emerging markets to boost competition

Some of the KEY CONCLUSIONS are:

- Result oriented approach to be taken in capacity addition of 1,00,000 MW by 2010-12 by addressing Installation and commissioning delays and problems to bridge the demand and supply gap and attaining surplus capacity since Competition requires a sufficient number of competitors and surplus supply of power.
- The goal of any power system is to provide reliable & economic electric service, and open access to transmission and distribution network act as a means to achieve just that. In simple words under the open access regime, customers are free to buy power from a company of their choice. And lot more have to be done to make open access a success and mere notification of regulations and approval of cases are not the solutions but number of cases implemented speaks of success

in Open Access in states. Though we have total 29 cases of open access approved only very few are for consumers, majority of these cases are for captive generators. Some of the main reasons behind it are

- High level of cross subsidy
- Inability of states to implement intra-state ABT necessary to take care of real time over-drawing or under-drawing against their allocated capacity through UI mechanisms.
- Inability at ULDC level to implement Demand control.

CHAPTER 1

INTRODUCTION

1.1 Overview

Traditionally, the organization of electric sectors was based both on integrated monopolies and a tight regulation that left no room for market forces. This type of organization found its doctrinal foundations on the natural monopoly character of the electric sector. This meant that power generation, transmission and distribution were less costly when carried out by one integrated firm than when performed by several firms. In other words: scale and scope economies supported the organization of the electric sector around franchised and vertically integrated utilities.

In the middle of the eighties, a new consensus emerged, which questioned the natural monopoly character of the electric sector. Increasing returns may favour that only one firm should provide transmission and distribution services; whereas reduced optimum size power generating plants allows for the participation of various firms without a loss of profits derived from scale economies. This holds even in small countries. As for scope economies among the different electric service activities, the new consensus states that, due to technological developments, transaction costs arising from the unbundling of generation, transmission and distribution are minor when compared with the efficiency costs involved in an integrated monopoly. As a consequence, there seems to be no reason to support the vertical integration of generation, transmission and

distribution activities.

Electricity markets are being radically transformed throughout the world. Over the last sixteen years most countries have undertaken reform processes leading to the liberalization of generation. Recently, some countries have introduced competition in the distribution segments of the industry.

Analyzing the international experience the main features of the paradigm pushing reform in Latin-American countries are five, as follows. First, large customers, generators and distribution companies enjoy free access to transmission and distribution networks. Second, a pool or spot market for power is established and futures markets for power are also at work in some countries. Nevertheless, in most countries large consumers, distribution companies and generators, may undertake transactions directly without using the organized spot or future markets. Third, wholesale power prices and prices paid by large customers are deregulated. Fourth, a franchise distribution company provides electricity to small and medium consumers. Customers are captives of the franchise Distribution Company and are, therefore, not free to switch providers in cases of poor quality service. Fifth, the lack of competition at distribution and free choice for small and medium consumers means regulation is needed to protect them.

Although reforms have resulted in a reduction in wholesale prices, the final outcome may be poor customer service for small and medium consumers, and regulations that disregard customer preferences in terms of price/quality ratios.

Competition that gives all consumers choices as to how to satisfy their power needs may promote efficiency in supplying small and medium sized customers and reduce the regulatory burden. The challenge is to introduce competition without losing the scale economies that are inherent to a sole distribution network. In order to do so, most proposals for introducing competition usually give consumers and independent distribution companies, direct access to wholesale markets, but they usually maintain a legal or de facto distribution monopoly. As do distributors in other sectors, power retailers buy electricity in the wholesale market and package it to meet consumer demands. Their survival and profits depend on their ability to satisfy consumer preferences and will, therefore, foster a lowering of prices and the development of new products to increase efficiency and consumer welfare. In this case, consumers instead of regulators, decide the appropriate combination of price and quality. By introducing choice at the retail stage through retailing companies or direct access by consumers to wholesale markets, market competition would ensure quality and appropriate pricing at the same time that consumers profit from a single distribution network. Regulators only have to establish rules for the retail market and will not need to set quality standards and prices.

1.2 Background

Electricity is one of the most vital infrastructure inputs for economic growth and industrial development of a country. Electricity is a life stream of country like India, which is gearing up its GDP to be one among the highest just after the Dragon economy and trailing closely behind those of developed nations which means imperatively that in growth of Indian power sector Power development is the key to the economic development.

The Power Sector has been receiving adequate priority ever since the process of planned development began in 1950, an era of monopoly in Indian electricity scenario. And from 1950 to 2012 the Indian electricity sector is moving from monopoly to regulated industry in early twenties and then from regulated environment to competitive environment envisaged in near future and this transfusion leads to many issues involved in moving from a regulated to a competitive environment, and thus assisting in developing appropriate forces, competition and consolidation, to alter the landscape of utility operations to cope up with transformation to bring competition among themselves.

Several countries, including India, are introducing competition into their electricity markets. This is a challenging process. Promoting effective and sustainable competition requires action on a number of related issues and an overhaul of traditional market structures and regulatory frameworks.

Reform experience in diverse jurisdictions in India and abroad so far highlights a converging trend towards introducing consumer choice of electricity supplier as a fundamental pillar of effective reform. This means stimulating competition not

only in generation, but also in electricity trading and supply as a service to consumers. At the same time, the need to regulate transmission systems effectively is becoming evident, so as to ensure a level playing field for market participants and sustain efficient investment in transmission. Many countries, including India, are also engaged in a major overhaul of regulatory institutions to oversee the new markets which are being discussed through this report.

The situation prevailing in power section in India today is similar to conditions which prevailed in power sector in several countries earlier. But many countries have overcome the problem. In India also we have some recent experience. The experience of India and several countries in reforming power sector are reviewed in this chapter.

Power sector is being restructured in a number of countries (developing and developed) all over the world. In the developing countries where the power sector entities were and are under public ownership on the plea that these are public utilities, there are now strong compulsions to look at the Power Sector in a different light. They are moving from state monopoly (usually set up as statutory body), to a corporatised entity with significant private participation and a regulatory mechanism to oversee their functioning. The main objectives of reforms in these countries are to:

- induce private investment in the power sector;
- introduce competition and increase the customer choice;
- improve efficiency and reduce the cost of electricity; and
- reduce the financial and administrative burdens imposed on Governments by the state owned power entities.

The strategy adopted by most of the countries was to segment the vertically

integrated structure of the power utility into functional organizations dealing exclusively with generation, transmission and distribution and establish a regulatory regime to oversee their working.

The developed countries are moving from regulation to deregulation with competition even at the distribution (retail level to supply power to the consumers at competitive rates).

Power generation in India is already thrown open for greater participation by private sector and the restructuring of Power is being initiated by a number of states, the leader being Orissa. It will be of interest and extremely useful to examine similar experience in different states of India in the area of Power Sector reform and restructuring which are being addressed through this report.

Chapter 2

POWER SECTOR REFORM

2.1 Introduction

The last two decades of power sector reform in developing countries present lessons with valuable insight into adjusting future development policies. During this time of global power market retrenchment and increased discussion about the merits of reform and privatization, it is particularly appropriate to examine what drives, and what results from, power sector reform.

2.2 Drivers of Power Market Reform

Power sector reform in emerging markets has four major drivers. These drivers have spurred the donor community to launch policies guiding the major initiatives, grants, loans, and conditionalities that have become the basic architecture of development assistance not only for infrastructure but for many other sectors.

The drivers of reform are outlined below and in Figure 2.1.

a) Capital Scarcity. In the 1980s, there was a recognized major shortage of capital to finance the required expansion of power capacity in developing countries. While, historically, developing country governments had financed their largely state-owned power utilities and supplemented their capital requirements with multilateral development bank (MDB) loans, it was recognized that these two sources would be entirely inadequate to finance power sector investment in the decades to come. The private sector was seen as the only additional source of capital that could close the power sector's financing gap. It

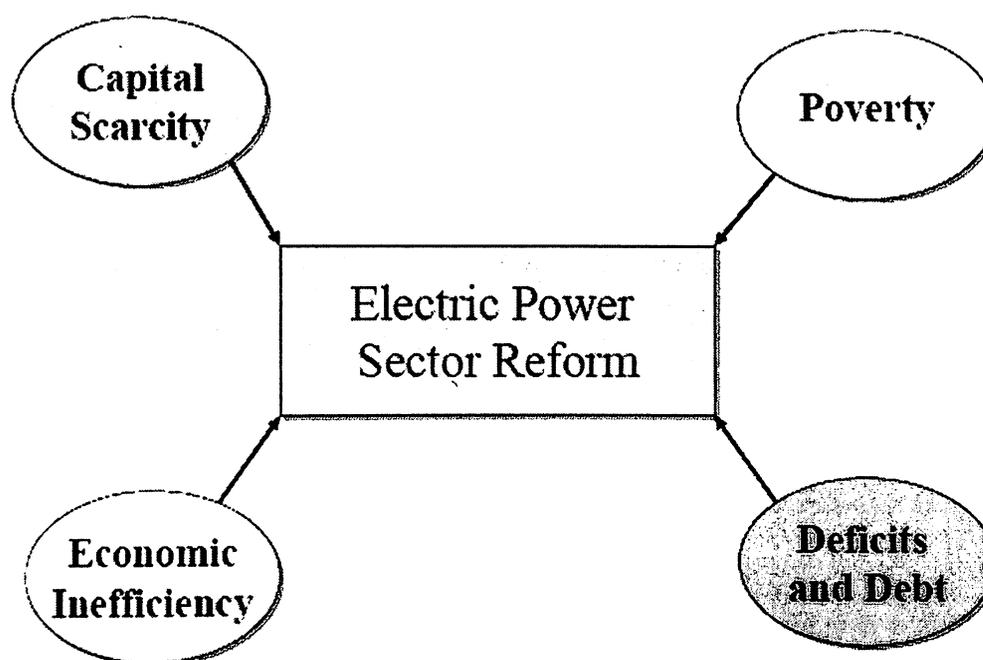
was recognized the private sector required higher financial returns than those needed by MDBs or governments; it was expected that the efficiency gains from private sector involvement would more than offset the higher cost of capital such involvement would entail. The challenge is reforming the power sector to attract the needed private investment.

b) Economic Inefficiencies. In most developing countries, the power sector has been troubled by high technical losses, a lack of cost recovery pricing, poor maintenance, low equipment reliability, high staff levels, low productivity, corruption, a crippling non-payments problem, and mounting debt. These factors have resulted in the commercial unsustainability of many developing countries' power sectors, which are unable to attract the needed private investment. If the power sector is unable to charge the consumer for the full cost of power, the public must then make up the difference in one form or another through direct or indirect taxes that support subsidies. These state subsidies necessary for financing the power sector's financial shortfalls have become a mounting burden that is no longer sustainable for many developing countries.

c) Persistent Poverty. The lack of reliable power and other infrastructure (particularly water, telecommunications, and transportation) has had a notably adverse impact on growth and has contributed to perpetuating poverty. The shortage of capital means power is rationed and that only those regions, major industrial or commercial consumers, or residential consumer blocks that can pay, have a chance of receiving reliable power. While this process reflects a natural market response, it condemns regions, neighborhoods, and populations to poor power availability and economic hardship; even though not all of those in these underserved groups is the source of non-payment problems. Mismanagement also

means misallocation of resources, which further worsens the availability and quality of power service. The net effect is that economic growth is constrained and poverty is not alleviated. The links between unreliable power and reduced economic growth have been established and reinforce the imperative to reform the power sector.

Figure 2.1- Drivers of Market Reforms



d) Debt and Deficits. The power sector in many developing countries is saddled with large debts accumulated from years of not charging cost recovery tariffs, not collecting from all consumers, not disconnecting consumers who do not pay, and using the utility as a vehicle for subsidies and political patronage for jobs and other favors. These power sector debts have led to non-payment to the central government and to governments having to channel sizeable shares of their budgets into subsidizing the power sector. These subsidies, along with other expenditures, have led to serious budget deficits that concern the international financial community and the International Monetary Fund (IMF) in particular.

For these reasons, power sector reform and privatization have been seen as attractive solutions to the problems of debt and deficits by transferring the power utilities to private companies that then assume the responsibility for eliminating the losses.

These four drivers have been the most important basis for power-sector reform policy in developing countries for the past few decades.

2.3 MARKET MODELS FOR REFORM

In response to these drivers of reform, the international development community has implemented programs to overcome barriers. The policy, legal, regulatory, and institutional development assistance that the bilateral and multilateral development institutions have offered focus on all four drivers. The need to attract capital and for increased economic efficiency has been addressed by bilateral development agencies through technical assistance, and has been re-enforced by the IMF, World Bank, and other multilateral donors through loans and conditionalities. Technical assistance and loans with conditionalities have promoted power-sector reform models and the technical processes that are discussed below. Regarding poverty alleviation, to meet the ambitious targets of the Millennium Development Goals set by the United Nations in 2000 (for instance, to cut in half the number of people living on less than one dollar a day between 1990 and 2015) implies the need for expanded electricity coverage.

A cornerstone of the responses to these drivers has been promotion of various power-sector reform models in developing countries over the past 20 years. These models have involved a major restructuring of the traditional vertically

integrated, state-owned power utility monopoly that has dominated the power sector of most developing countries.

These power-sector reform models have evolved over the past two decades to incorporate the latest market designs emerging from industrialized countries, notably the United Kingdom, the United States, Chile, and the Scandinavian nations. The four basic models that have existed in the power sector worldwide are listed below in Figures 2.2-2.5 and are illustrated in the diagrams in figures 2.2-2.5. The single buyer, wholesale competition, and retail competition models have been promoted over the past 20 years in developing countries.

a) Monopoly Model.

The power sector is dominated by vertically integrated utilities with full monopoly power in their service territory and that either engages in self regulation of tariffs or is regulated by some outside entity

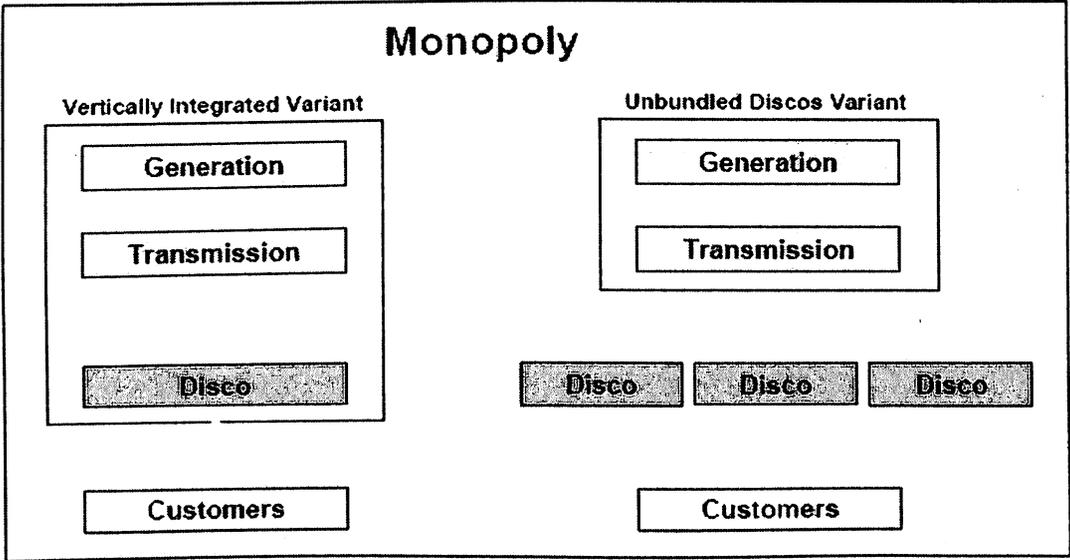


Figure 2-2. Power Market Models – Monopoly

b) Single Buyer Model. The utility is still vertically integrated, but it enters into power purchase agreements (PPAs) with independent power producers. A

variation is where an unbundled power sector has separate generation companies (“gencos”), transmission companies, and distribution companies (“discos”), and where the central transmission dispatch company purchases all wholesale power.

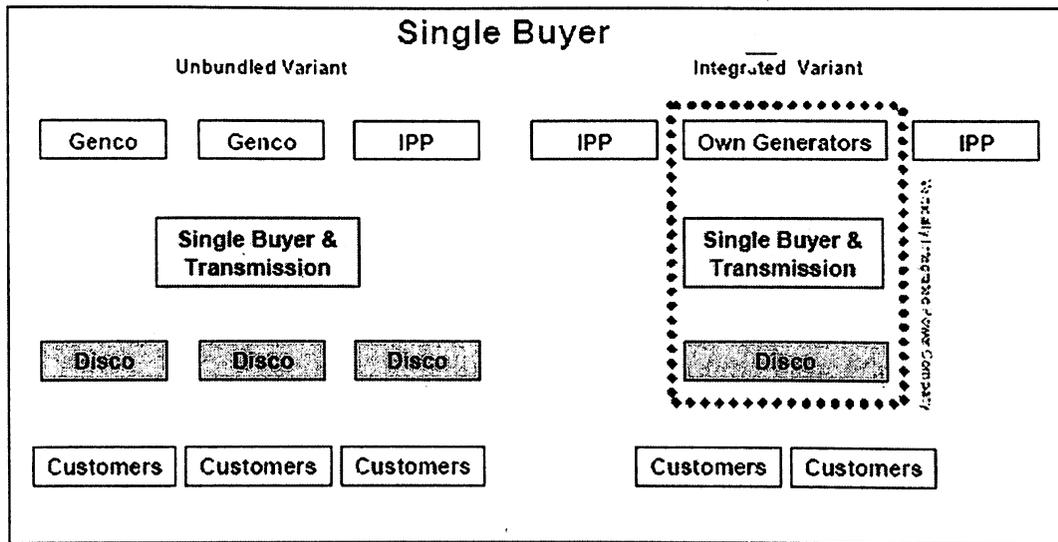


Figure 2-3. Power Market Models – Single Buyer

c) **Wholesale Competition Model.** The power sector has undergone unbundling of generation, transmission, and distribution and is establishing a regulatory authority to set up a multi-buyer, multi-seller competitive power market. Competition only takes place at the wholesale power market level through bilateral contracts and the spot market.

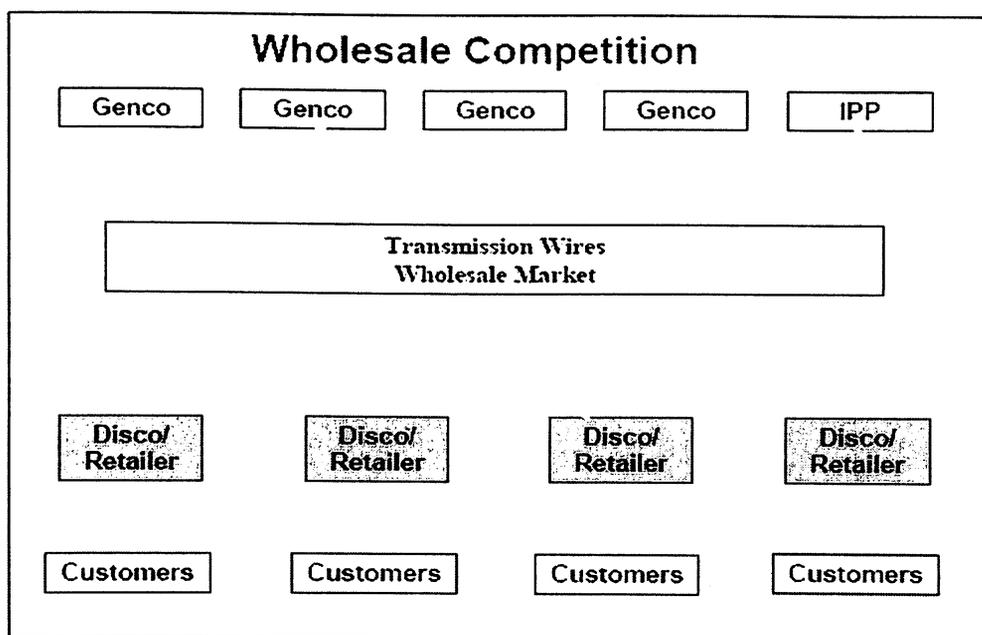


Figure 2-4. Power Market Models – Wholesale Competition

d) **Retail Competition Model.** Identical to the wholesale competition model in that the power sector has undergone unbundling of generation, transmission, and distribution and.

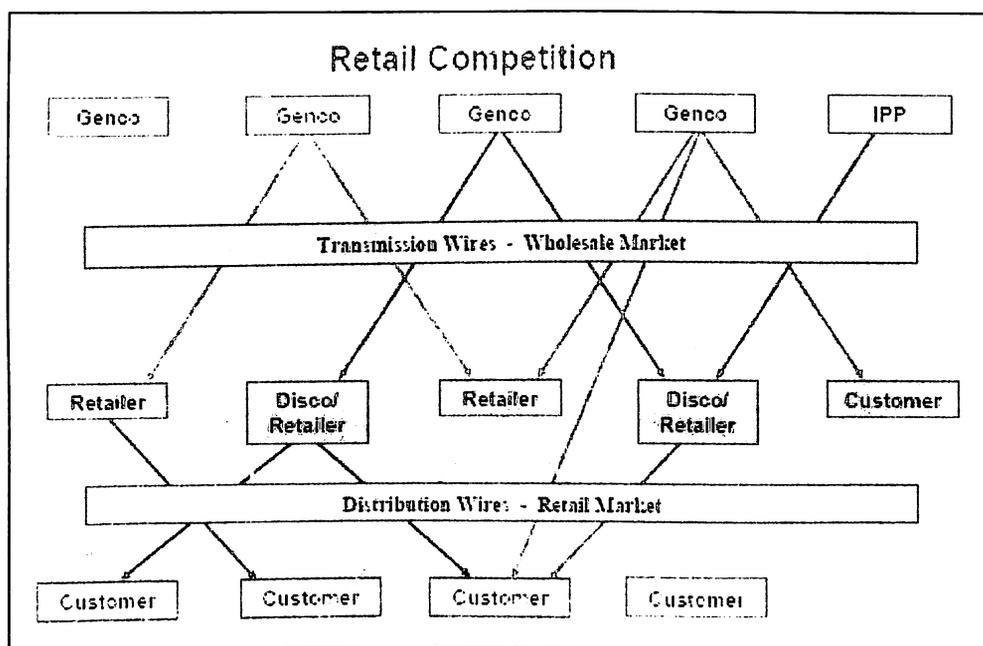


Figure 2-5. Power Market Models – Retail Competition

is establishing a regulatory authority to set up a multi-buyer, multi-seller competitive power market. However, this model has competition taking place not

only at the wholesale power market level but also at the retail level through competition in the supply of power

2.4 Objectives of power market reforms

These power market reforms have had different objectives in the developed versus developing world. While the power sector in industrialized countries has generally been commercially viable and has provided reliable and quality service to the entire population, the power sector in many developing countries has not been commercially viable without major state subsidies and has provided power, often unreliably, to only a fraction of the population. Given these two different sets of circumstances, it is hard to expect that the same market reform approaches can be implemented in the same way.

While the long-term objectives – to create commercial and competitive power markets might well converge, the near-term strategies will not be the same. The different objectives of power market reforms between industrialized and developing countries are worth noting.

- In industrialized countries, market reforms were intended to create competition in order to reduce prices and increase consumer choice. Liberalization of power markets and the introduction of competition into a traditionally regulated monopoly industry were intended to bring down power costs, therefore benefiting consumers and prompting greater economic competitiveness and growth.
- In developing countries where prices are often below the level of full cost recovery (with reforms sometimes requiring higher tariffs in the near term), the focus is on introducing commercial principles that will attract investment

and improve the reliability, quality, and coverage of service.

These different market environments and near-term objectives should have influenced how market reforms were introduced in developing countries. Hindsight can clarify some of the ensuing power sector problems over the past two decades. The World Bank's Operations Evaluation Department (OED) report, *Private Sector Development in the Electric Power Sector*, concludes not enough thought has been given to the political economy of each developing country, when addressing the appropriateness of its power sector reform plans.

In addressing how to make the reforms applicable, the following considerations are worth noting.

a) Level of Market Maturity. Exporting the power market models of industrialized countries to developing countries may not have been appropriate in all cases, given the limited maturity of the enabling legal, regulatory, institutional, and governance structures. There is a growing recognition of the need to better understand the political economy in each country, in order to apply more successfully reform measures exported from different societies and cultures. For example, it may be premature to export a deep pool market model from the U.K. to an emerging or transitional country (as occurred in Ukraine) that does not have similar systems and institutional capacity. It may have also been overly optimistic in some cases to introduce a regulatory agency into a country with no history of an independent regulator and then to expect that regulatory body to fulfil its prescribed functions with only a few years of institutional development and training.

b) Large Versus Small Markets. Many developing countries have small

economies with small power systems. These systems at present are usually not connected to regional power pools that provide depth to power markets (emerging power pools such as the South Africa Power Pool [SAPP] and the Central American Countries Interconnection System [SIEPAC] will change this picture over time). Despite these small markets, initial attempts at reform sometimes tried to apply specific features of large, sophisticated power market models, which have evolved in the industrialized world, to some of these small power markets in the developing world. It may have been inappropriate, for instance, to unbundled a power system with less than 1000 megawatts (MW) of capacity into many separate generation and distribution companies, with the assumption that real competition can be promoted.

c) Rapid Economic Growth Versus Stagnant Markets. Some developing countries, notably in Asia, have experienced robust economic growth based on sound industrial development and as a result have experienced strong growth in electricity demand. Urgent investment has been needed in Asia to expand power capacity through Greenfield projects. In other regions, notably among the countries of the Former Soviet Union (FSU) and in Eastern Europe, there was economic stagnation or decline due to the collapse of the Soviet Union, and these countries actually had excess capacity. Under communism, the power systems in FSU countries did not have the necessary commercial practices and pricing; as a result, the FSU countries have had an inefficient and commercially unsustainable power sector crippled by artificially low tariffs, poor collections, theft, and corruption. The FSU and Central and Eastern Europe (CEE) regions have generally focused on attracting investment not so much for new generation but for modernizing and commercializing the existing power system. Implementing

reforms in these two diverse markets and regions has been a notably different process.

d) Full Versus Partial Divestiture. Some countries, particularly in Latin America, the FSU, and Eastern Europe, were prepared for political and cultural reasons to support asset transfers (i.e., privatization) of power companies to private investors. In other countries, notably in Asia, there was considerable reluctance to sell state utilities to private owners, and thus there was an emphasis on entering into PPAs with independent power producers (IPPs) who would be contracted to build-own-operate (BOO) or build-own-transfer (BOT) power plants. Asset transfers were typically done in the context of promoting a competitive multi-buyer, multi-seller competitive market, while IPP projects were promoted in the context of a single buyer power-sector model with the goal of attracting investment. This distinction has become complicated by the fact that countries that had started with IPPs have typically then restructured their power sectors to allow for greater competition. This process has led to concerns about stranded assets that result from long-term PPAs. Long-term PPAs are seen as incompatible with establishing a competitive market. There is a trade-off between the economic efficiencies that can be achieved through greater competition and the need to provide a stable market environment with long-term contracts, which private investors who participate in risky emerging markets require.

These and other dimensions of the reform development process illustrate how major and sometimes subtle distinctions between different countries, economies, and cultures may need to be better understood in order for the reform process to advance sustainably.

2.5 Power Market Framework

The overall power market reform process plays an important role in defining the investment risks in the power sector. The major drive to attract private capital into the power sector of emerging markets has occurred as the power sector in many countries has been going through a profound transformation. The transition from a vertically integrated monopoly business reliant upon regulation (to curb monopoly power) to an unbundled market that sets wholesale prices based on competition, is a major undertaking. This transition has involved going from vertical integration to the single buyer and then to the multi-buyer and multi-seller model. The merits of competition have been clearer in the industrialized world that was expecting more competitive pricing and better provision of services (Stuggins and Krishnaswamy, 2003). In developing countries, the benefits of competition were more difficult to realize because of average tariffs often being below the costs of production and due to high cross subsidies.

CHAPTER 3

DEVELOPMENT OF MARKET IN POWER AND COMPETITION

3.1 Introduction

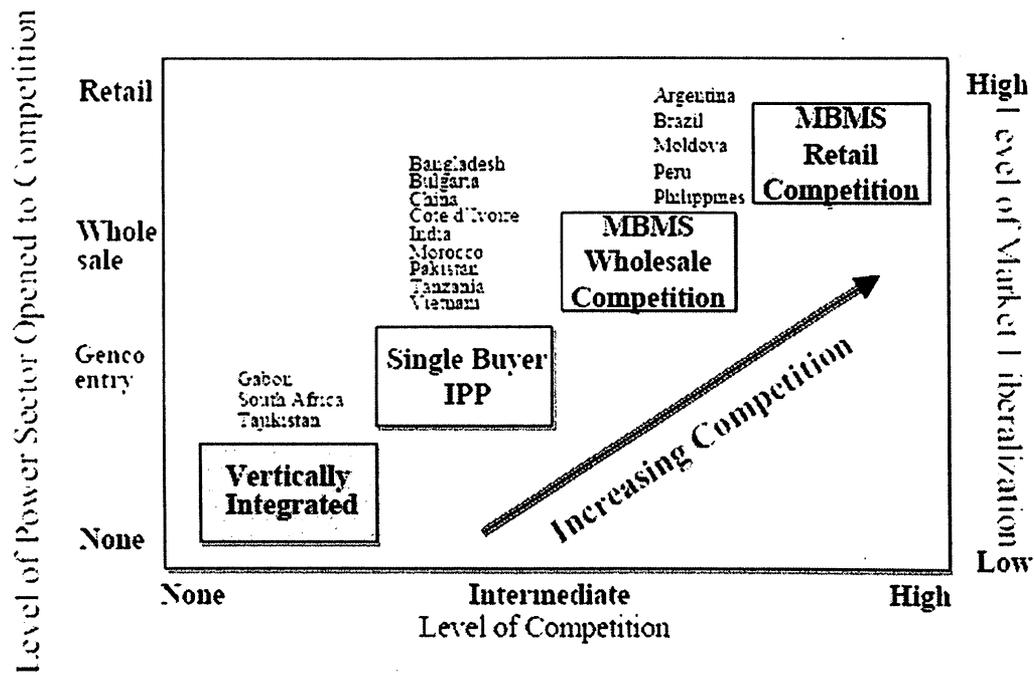
The evolution of power market models world wide has become progressively more complex, presenting the international development community with greater challenges. From the 1950s to 1980s, the World Bank generally provided sovereign loans to vertically integrated state-owned power utilities. This framework was a relatively simple financing structure; nonetheless, it took years to put in place properly. While in some countries (e.g. South Korea and Thailand) these loans have led to effective power sector development, in many developing countries with poor power sector policies and governance (e.g., India and Indonesia), lending to vertically integrated power utilities has proven to be commercially unsustainable. This commercial unsustainability of Indian utilities which were performing poorly and comprises mostly of state utilities under State electricity boards which were plagued with huge debts and commercial losses leading to restructuring of Indian electricity market model during the 1990s, thus a policy shift was promoted. It called for instituting the single buyer model where state-owned utilities would purchase power from privately financed, owned, built, and operated power plants procured on either a BOO or a BOT basis. This transformation to promote private players in generations was due to inability to arrange funds for capacity addition to keep up with growing demand in power and also to promote competition in state utilities by bringing in private players.

During the 1990s, there was a growing tendency in India to pursue a plan of unbundling of the power sector, establishing an independent regulator, and then privatizing assets. At this stage, the focus was on privatizing distribution companies to bring the pricing of wholesale and retail power to cost recovery levels, to improve collections, and to enforce disconnections for non-paying customers. The privatization of distribution companies (or "discos") was pursued to monetize the power sector of many developing countries, which had often relied on artificially low tariffs, barter, and offsets to maintain their financial stability. This push to full power sector restructuring and unbundling based on the competitive market model involved an even higher level of complex financial engineering.

The progression of the power market model from a vertically integrated, state-owned monopoly to an unbundled competitive market has been under way throughout the industrialized and developing world during the past few decades. As shown in **Figure 3-1**, this market evolution has introduced competition first at the single buyer level, then at the wholesale market level, and finally at the retail market level. With increased competition has come more complexity and uncertainty that requires new management mechanisms. The industrialized countries have been in the forefront of this move to competitive markets, and they have been better able to manage this new complexity and uncertainty because their power utilities are more commercially viable, their regulatory institutions are more mature, their capital markets are more developed, and their

ability to finance and implement the necessary information technology (IT) is greater.

Figure 3-1. Power Market Model Transitioning



The ability of the power industry in developing countries to adapt to more complex market and financing structures has raised new challenges, which these countries have been less equipped to address.

In Indian perspective this shift in monopoly model towards competitive model under regulated environment ensued with advent of Electricity Act 2003 and Competition Act 2002. There are many reasons why competition in this sector should be initiated and promoted.

The competition in this sector will lead to

- Increases efficiency
- Allows competing producers to access multiple buyers; eliminates shortages

- Creates a market that enables investment conducive to economical and political democracy
- Competitive forces will yield:-
 - the best allocation of economic resources
 - the lowest prices
 - the highest quality
 - Enhances consumer welfare

3.2 Drivers of Competition

The trends in the emerging markets foresee a process towards competition in the electricity sector and introduction of "Customer choice" argument. Customer choice in electricity provision will not be possible without competition in the Electricity Sector.

Moreover, in nearly all industrial and developing countries that are committed to economic reform the trend goes universally in the direction of widening the scope for competition. With reference to India, a detailed study of the Electricity Sector and the prevalent Electricity Laws reveals that there had been a need to enact a new self-contained Legislation harmonizing and rationalizing the provisions of the Indian Electricity Regulatory Commissions Act, 1998. Thus came into existence the Electricity Act, 2003, that advocates the policy of encouraging private sector participation in generation, transmission and distribution with the objective of distancing the regulatory responsibilities from the Government to the Regulatory Commissions.

Transition within the Electricity Sector in India from public to private sector gives a lot of scope to competition. An essential prerequisite for wholesale competition to work is that there are a large number of generators to ensure that none of them can exercise market power. With a large number of independent competing units in power generation, each will compete to maintain their utilisation by bringing prices down to marginal costs in an attempt to maintain a contribution to their fixed costs.

Although actual consumer choice is limited in the power sector, pressures for looser regulations and more consumer freedom have increased and become more widespread in recent years. Thus introducing competition in different segments of the electricity industry is one of the key features of the Electricity Act, 2003. Competition will lead to significant benefits to consumers through reduction in capital costs, competitive rates and also efficiency of operations.

There are various drivers which strengthen and creates conducive environment for competitive environment from single buyer model, these drivers are being discussed below in this section.

a) Capacity Addition

A major challenge which reformers have had to tackle is that lifting barriers to entry and changing the rules is not enough. Competition requires a sufficient number of competitors. If supply is concentrated in a few firms, competition generally fails to develop and prices may remain persistently above their competitive levels. At present India is facing a energy deficit of 10.7% and peak deficit of 13.1% (Power situation April 2006- May 2006) this depicts that there is appreciable gap between Demand and Supply which is though decreasing

with elapsed time but for competitive environment it is a must that supply should be in surplus as compared to demand of power thus entailing choice to consumer and competition between utilities to retain their consumers.

The Government of India has taken up several reform measures with target to add 100,000 MW additional capacity by 2002-12 to create a favourable environment for addition of new generating capacity in the country. The Electricity Act 2003 has provided a highly liberal framework for generation. There is no requirement of licensing for generation. The requirement of techno- economic clearance of Central Electricity Authority (CEA) for thermal generation project is no longer there. For hydroelectric generation also, the limit of capital expenditure, above which concurrence of CEA is required, is likely to be raised suitably. Captive generation has been freed from all controls.

The generation capacity can be augmented and enhanced by following means:

i) New Installed capacity

To encourage private investment as well as investment by prevalent government companies in generation to keep pace with growing demand the Government of India has initiated several reform measures to create a favourable environment for addition of new generating capacity in the country. The Electricity Act 2003 has put in place a highly liberal framework for generation. There is no requirement of licensing for generation and the requirement of techno-economic clearance of CEA for thermal generation project is no longer there. Further, Section 61 and 62 of the Act provide for tariff regulation and determination of tariff of generation, transmission, wheeling and retail sale of electricity by the Appropriate Commission. Section 63 of the Act states that –

"Notwithstanding anything contained in section 62, the appropriate commission shall adopt the tariff if such tariff has been determined through transparent process of bidding in accordance with the guidelines issued by the central government."

The guidelines under Section 63 provide for procurement of power on long term basis for a period of seven years and above and also on medium term basis from one year to seven years. The guidelines shall apply for procurement of base-load, peak-load and seasonal power requirements through competitive bidding, through the following mechanisms:

- **Case I :** Where the location, technology, or fuel is not specified by the procurer. Only quantum of power and delivery point are specified;
- **Case II :** Location specific projects which procurer intends to set up under tariff based bidding process for supply of power. In this case fuel arrangement could be either by procurer or bidder.

Existing generation projects are being developed in line with case 2. However, the initiative has not gathered momentum as had been envisaged and commensurate efforts on the part of states would be required for the implementation of these guidelines via Progress of Capacity Addition in States through Competitive Bidding which is evident from data of states provided in Annexure 1 depicts that though the progress has been slow, it has been steady. However, to make Indian power sector fully competitive there is a need to expedite the implementation of competitive bidding procedures. In view of this, following measures can be taken:

- Expediting invitation of expressions of interest by states for procurement of power in accordance with the guidelines issued under section 63 of Electricity Act.
- In case of location specific projects, specific adjustments could be made with the consent of the State Electricity Regulatory Authority (SERC) to be able to proceed with procurement with a view to getting adequate competition and attractive tariffs.
- Evolving modalities for joint procurement of power by distribution licensees in a region could be attempted for large capacities. This would have the advantage of getting optimal size of projects with economies of scale and quick capacity addition

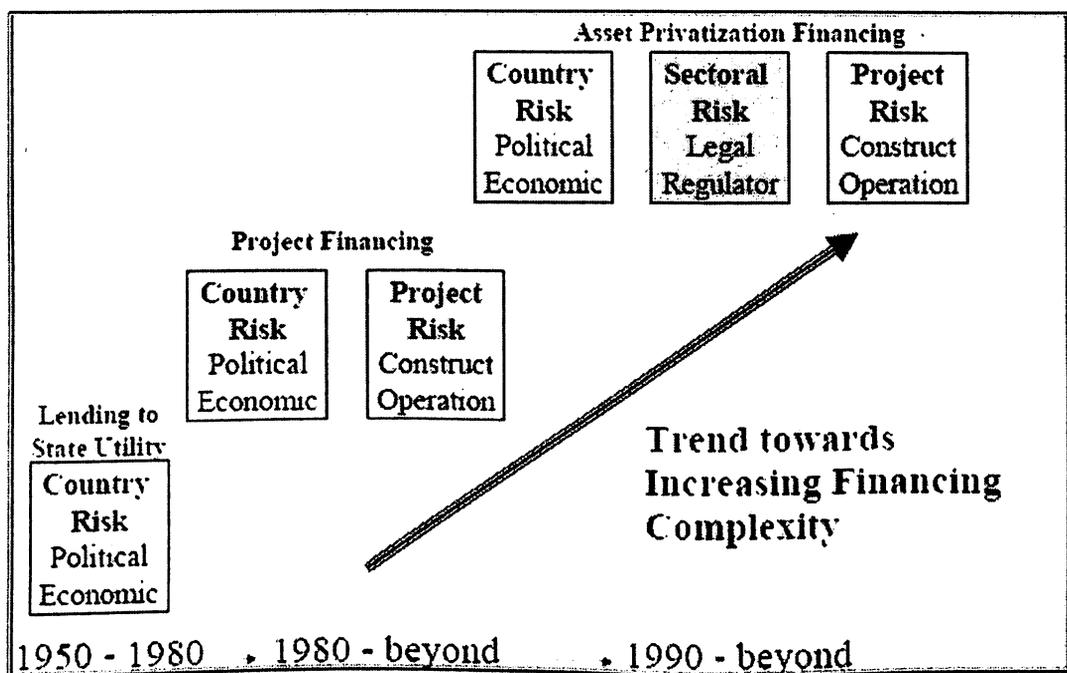
ii) Renovation & Modernisation of Available Old Generation capacity

A marked improvement in the average PLF of thermal generation plants is now being seen. The average PLF during 1990-91, which was 53.8%, rose to 72.7% during 2003-04 and in the current year, is expected to be around 75%. The National Electricity Policy states that Renovation and Modernization for achieving higher efficiency levels needs to be pursued vigorously and all existing generation capacity need to be brought to minimum acceptable standards. Govt. of India is providing financial support for this purpose. The R&M is a necessary thrust to Capacity addition since R&M requires broadly 1 crore per MW in comparison to industry trend of 4 crore per MW for thermal power plants which includes overhauling and implementation of new technologies in older plant to increase their PLF and Reduce inefficiencies in generation plants to enable low cost power production.

b) Financing Mechanism

The evolution to competitive power markets and privatization has resulted in more complex financing structures. The basic country, market, and commercial risks exist regardless of the market design, yet the introduction of competitive markets and private sector investors and market participants changes how these risks need to be analyzed and handled. As shown in **Figure 3-2**, the evolution from first a basic loan to a state-owned vertically-integrated utility, then next to project financing, and then to divestiture, involves breaking out and managing the risks into more discrete categories such as country risk, power sector risk, and project risk. There needs to be a better understanding of how to best manage these risks in a sustainable way. New mechanisms for addressing these risks have emerged: financial engineering designs, guarantees, insurance, and other related mechanisms are to used to mitigate the risks.

Figure 3-2 Trend Towards Increasing Financing Complexity



The sources of capital for the power sector have different levels of risk preferences and stability, as shown in **Figure 3-3** below. The split between foreign and domestic capital is an important distinction. Strategic investors who supply foreign capital are relatively risk averse and, if they are willing to so commit their capital, require a relatively high return and and/or guarantees to address risks that they are unable to control. Foreign capital markets financing is volatile and prone to rapid capital flight during periods of uncertainty and crises. The source of domestic capital is meanwhile beginning to shift from public-sector financing to domestic strategic investors. In many developing countries, an emerging and nascent capital market and banking sector are increasing the opportunity for domestic financing. Foreign capital will likely play an important transitional role in financing industrialization in developing countries. Domestic capital, on the other hand, plays a dominant role in financing infrastructure in industrialized markets and is the largest potential source of financing in countries with maturing capital markets and banking sectors.

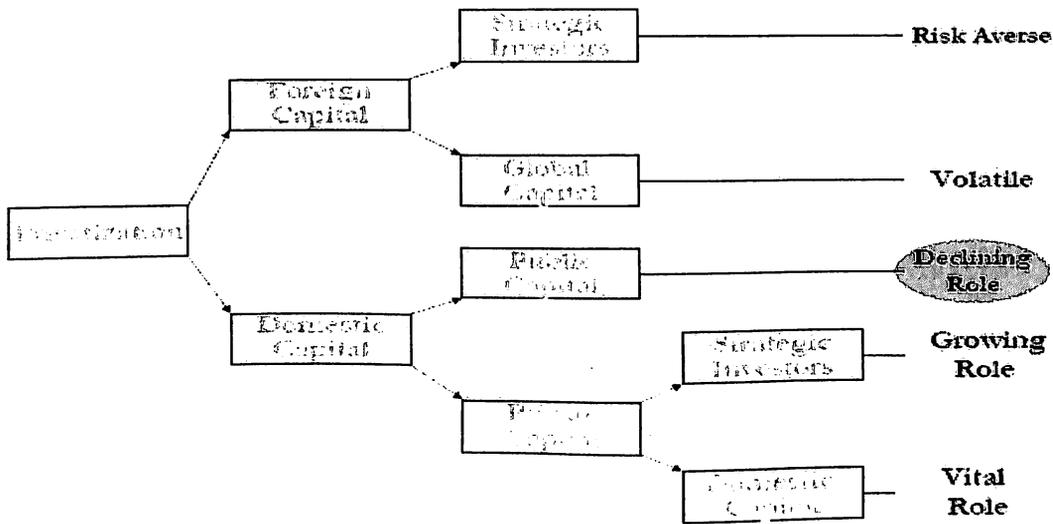


Figure 3-3 Strategies for Mobilizing Foreign Versus Domestic Capital

A different way of presenting the applicability of these financing structures is found in figure 3-4 below depicting Power financing models in emerging markets Strategies for mobilizing Foreign versus Domestic Capital. The applicability of financing structure here is presented on two axes: level of country and sector risk, and the level of development in terms of GNP per capita.

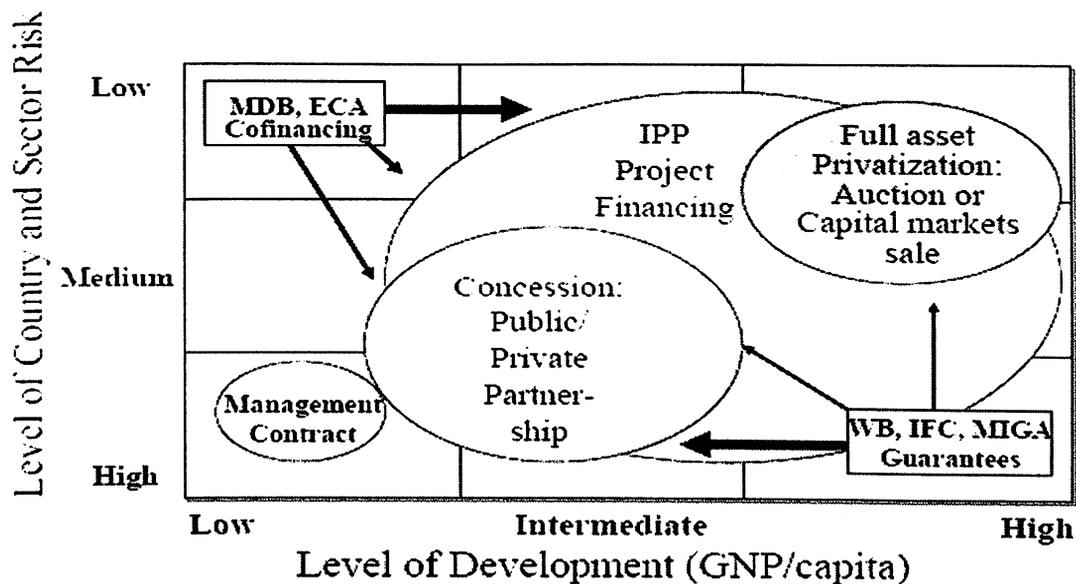


Figure 3-4. Power Financing Models in Emerging Markets

c) Regulation

Development of regulation compatible with undistorted market performance is a key challenge for most regulatory systems as the required know-how and procedures involved in developing market-oriented regulation are radically different from those needed without competition. This is where Regulatory authorities play a key role in ensuring efficiency both in the competitive and the monopolistic part of the Electricity Sector. Monopoly activities (transmission and distribution) should be regulated by incentive-based regimes that contribute to cost efficiency in operations and investments. Market-based competitive activities should be monitored and interventions should be considered where

there are unresolved problems with market mechanisms or market power. The Regulator should also, together with political authorities, push towards broader scope for competition in the retail market. Finally the Regulator has an important role to play in monitoring and enforcing licence conditions. Regulators play a decisive and pro-active role in ensuring that the reforms actually develop towards competition and efficiency improvements.

The emergence of an open market economy necessitated structural changes in laws relating to investment and competition so that there is un-inhibitive from single buyer model to competitive model and this transformation was initiated and taken care by the

i) Electricity Act, 2003 and ii) Competition Act 2002.

i) Electricity Act, 2003

The electricity sector has been subjected to substantial reform, by the enactment of the Electricity Act, 2003 ("EA") - which seeks to promote competition in all levels of the electricity sector, i.e. generation, transmission and distribution, thereby encouraging private investment in the sector. One of the critical elements in creating a sector with an enduring climate conducive to private investment is to distance the regulatory responsibilities from the government to the regulatory commissions.

Open Market Economy has segregated the role of government as market participation and a final arbiter. Private sector and foreign investors prefer participation of independent regulators, in markets where the government and large firms are significant stakeholders. Apart from generating trust, regulators

are required to assist in introduction of policies in transparent and non-discriminatory manner.

Under the Electricity Act, 2003, the Regulatory Commissions are established and under section 79(1) the Central Commission is required to discharge the following functions:

- To regulate the tariff of generating companies owned or controlled by the Central Government;
- To regulate the tariff of generating companies other than those owned or controlled by the Central Government specified in clause (a), if such generating companies enter into or otherwise have a composite scheme for generation and sale of electricity in more than one state;
- To regulate the inter-state transmission of electricity:
- To determine tariff for inter-state transmission of electricity;
- To issue licenses to persons to function as transmission licensee and electricity trader with respect to their inter-state operations;
- To adjudicate upon disputes involving generating companies or transmission licensee in regard to matter connected with clauses (a) to (d) above and to refer any dispute for arbitration;
- To levy fees for the purpose of this Act;
- To specify Grid Code having regard to Grid Standards;
- To specify and enforce the standards with respect to quality, continuity and reliability of service by licensees;
- To fix the trading margin in the inter-state trading of electricity, if considered, necessary.

- To discharge such other functions as may be assigned under this Act.

ii) Competition Act 2002

The policy behind the legislation shifted from curbing monopolies to promoting competition. In order to improve competition and remove distortions caused by monopoly power, the Competition Act 2002 was enacted in December 2002. It is a landmark legislation that aims at promoting competition, through prohibition of anti- competitive practices, abuse of dominant position and regulation of companies beyond a particular size.

With the growing presence of private players in the market along with the public sector entities, there arose a demand for an enactment that would encourage 'competition'. Hence 'competition advocacy' was seen as a useful tool to usher in regulatory reforms and create a policy climate that favours deregulation in a number of sectors - all of which was aimed to increase consumer welfare.

Objectives of the Competition Act, 2002

Competition Act, in order to prevent practices having adverse effect on competition, seeks to prohibit and regulate the following economic activities:

- Anti- Competitive Agreements among enterprises
- Abuse of Dominant Position
- Regulation of combinations

Anti- Competitive Agreements among Enterprises

The Competition Act envisages that no enterprise, association of enterprises or persons or association of persons shall enter into any agreements in respect

of production, supply, distribution, storage, acquisition or control of goods or provision of services, which causes or is likely to cause an appreciable adverse effect on competition within India.

The Act clearly prohibits :

- tie-in arrangements which require the purchaser of goods, as a condition of such purchase to purchase some other goods;
- exclusive supply agreements that restrict the purchaser in the course of his trade from acquiring or otherwise dealing in any goods other than those of the seller or any other person;
- exclusive distribution agreement that limit, restrict or withhold the output or supply of any goods or allocate any area or market for the disposal or sale of the goods;
- refusal to deal agreements, includes agreements which restricts, or is likely to restrict, by any method the persons or classes of persons to whom goods are sold or from whom goods are bought, and
- resale price maintenance agreement i.e an agreement to sell goods on condition that the prices to be charged on the resale by the purchaser shall be the prices stipulated by the seller unless it is clearly stated that prices lower than those prices may be charged.

Although the competition law can examine and adjudicate upon anti-competition practices, all agreements cannot be weighed within the yardsticks of competition. For example, Intellectual Property regime, the rationale of which is to encourage human creativity, provides monopoly rights to the owner to exploit their 'property' commercially for a particular period.

Abuse of Dominant Position

'Dominant Position' under the Act would mean the position of strength, enjoyed by an enterprise, in the relevant market, in India, which enables it to operate independently of competitive forces prevailing in the relevant market; or the ability of an enterprise to affect its competitors or consumers or the relevant market in its favour. Any enterprise abusing such position would be flouting the objective of the present Act, which encourages emergence of a healthy competitive market.

Abuse of dominant position would include attempts at predatory pricing, territorial restrictions, vertical and horizontal monopolies etc.

Regulation of combinations

The Act envisages prohibiting any such combination, acquisition and merger, which causes or is likely to cause an appreciable adverse effect on competition within the relevant market in India and such combination, is void under the Act.

Narrowing the scope to the Regulations as provided in Annexure 28 which takes care of promotion of competition made under Electricity Act 2003 are:-

- i. Section 181/ sub-section (2)/ clause j :- which empowers State commissions to make regulations for reduction and elimination of surcharge and cross subsidies under second proviso to sub clause (ii) of clause (d) of sub-section (2) of section 39 which defines that the functions of the State transmission Utility shall be able to provide

non-discriminatory open access to its transmission system for use by-

- i) any licensee or generating company on payment of the transmission charges ; or
- ii) any consumer as and when such open access is provided by the State commission under sub-section (2) of section 42, on payment of the Transmission charges and a surcharge thereon, as may be specified by the State Commission

ii. Section 181/ sub-section (2)/ clause k :- which empowers State commissions to make regulations for manner and utilization of payment of surcharge under the fourth proviso to sub-clause (ii) of clause (d) of sub-section (2) of section 39 which defines that the functions of the State transmission Utility shall be able to provide non-discriminatory open access to its transmission system for use by-

- i) any licensee or generating company on payment of the transmission charges ; or
- ii) any consumer as and when such open access is provided by the State commission under sub-section (2) of section 42, on payment of the Transmission charges and a surcharge thereon, as may be specified by the State Commission

iii. Section 181/ sub-section (2)/ clause m :- which empowers State commissions to make regulations for payment of transmission charges and a surcharge under sub-clause (ii) of clause c of section 40 which defines the duty of transmission licensee to provide non-

discriminatory open access to its transmission system for use by any consumer as and when such open access is provided by the State commission under sub-section (2) of section 42, on payment of the Transmission charges and a surcharge thereon, as may be specified by the State Commission.

- iv. Section 181/ sub-section (2)/ clause o :- which empowers State commissions to make regulations on proportion of revenues from the other business to be utilised for reducing the transmission and wheeling charges under the proviso to section 41 which defines the Other business of transmission licensees
- v. Section 181/ sub-section (2)/ clause p :- which empowers State commissions to make regulations for reduction and elimination of surcharge and cross-subsidies under the third proviso to sub-section (2) of section 42 which defines the duties of distribution licensees and open access and it shall have due regard to all relevant factors including such cross subsidies and other operational constraints provided that such surcharge and cross subsidies shall be progressively reduced and eliminated in the manner as may be specified by the State Commission
- vi. Section 181/ sub-section (2)/ clause y :- which empowers State commissions to make regulations for the proportion of revenues from the other business to be utilised for reducing wheeling charges under the proviso to section 51 which defines the Other business of distribution licensees
- vii. Section 181/ sub-section (2)/ clause z :- which empowers State

commissions to make regulations for duties of electricity trader under sub-section (2) of section 52 which defines the provisions with respect to electricity trader as specified by the Appropriate Commission.

- viii. Section 181/ sub-section (2)/ clause za :- which empowers State commissions to make regulations on standards of performance of a licensee or a class of licensees under sub-section (1) of section 57 which defines that appropriate Commission may, after consultation with the licensees and persons likely to be affected, specify standards of performance of a licensee or a class of licensees.
- ix. Section 181/ sub-section (2)/ clause zc :- which empowers State commissions to make regulations for the period within which the Cross subsidies shall be reduced and eliminated under clause (g) of section 61 which defines that the tariff progressively, reflects the cost to supply of electricity, and also reduces and eliminates cross-subsidies within the period to be specified by the Appropriate Commission
- x. Section 181/ sub-section (2)/ clause zi :- which empowers State commissions to make regulations for the manner by which development of market (including trading) specified under section 66 which says that the Appropriate Commission shall endeavour to promote the development of a market (including trading) in power in such manner as may be specified and shall be guided as per the National Electricity policy referred to in section 3 in this regard.
- xi. Sec 60, IE Act, 2003 :- Preventing market domination is the

responsibility of the Regulators.

- xii. Section 63: - which speaks of determination of Tariff by bidding process in which the Appropriate Commission shall adopt the tariff if such tariff is determined through transparent process of bidding in accordance with the guidelines issued by the Central Government.
- xiii. Section 7:- which furnishes that any generating company may establish, operate and maintain a generating station (except Hydro-electric generation) without obtaining a licence under this Act if it complies to the technical standards relating to connectivity with the grid referred to in clause (b) of section 73 which defines the functions and duties of Authority to specify the technical standards for constructing of electrical plants, electrical lines and connectivity to grid.
- xiv. Section 79(2)(4) of the Electricity Act (EA) 2003 it is clearly mentioned that, "In the discharge of its functions the Central Commission shall be guided by the National Electricity Plan and Tariff Policy published under Section 3."

CHAPTER 4

MECHANISM AND INITIATIVE FUELLING COMPETITION

In above chapter we have seen that there are many regulations in place to promote competition but there should be proper mechanisms and initiatives to be taken by government, commissions, utilities etc. to materialize the concept of competition and this is being done through below mentioned mechanisms:-

1) Government Policy

a) National Electricity Policy

In compliance to the section 3 of the Electricity Act 2003 the Central Government notified the National Electricity Policy on 12th February 2005. The NEP aims at laying guidelines for accelerated development of power sector, providing supply of electricity to all areas and protecting interests of consumers and other stakeholders keeping in view availability of energy resources, technology available to exploit these resources, economics generation using different resources, and energy security issues. The policy seeks to address the issues to various facets of the power sector. The issues pertaining to the NEP are as follows:

- i. Grid Code: The SERC who have not notified the grid code under the Electricity Act 2003 should notify the same not later than September 2005.
- ii. Technology Up-gradation: State Commissions have to ensure that technology upgrades matching the facilities available with RLDC are

provided at the State level, where necessary and realized not later than June 2006.

- iii. Open Access Transmission & Distribution wheeling charges: The Appropriate commissions are to establish transmission charges for open access sought by competing generators no later than June 2005. Also, the Appropriate Commission shall notify regulations by June 2005 that would enable open access to distribution networks. While making these regulations, the SERC's will also determine wheeling charges and cross-subsidy surcharge.
- iv. Time bound program on AT&C losses: A time bound programme is to be drawn up by the SERC for the segregation of technical and commercial losses through energy audits. Energy accounting and declaration of its results in each defined unit, as determined by SERC's should be mandatory not later than March 2007. An action plan for the reduction of the losses with adequate investments and suitable improvements in governance should be drawn up Standards for reliability and quality of supply as well as for loss levels shall also be specified, from time to time, so as to bring these in line with international practices by year 2012.
- v. Metering Plans: The SERC's to obtain from the distribution licensees their metering plans, approve these, and monitor the same. The SERC's to encourage use of pre-paid meters. In the first instance, TOD meters for large consumers with a minimum load of one MVA also to be encouraged. The SERC's to also put in place independent third party meter testing arrangements.

- vi. Implementation of HVDS, SCADA & Data Base Management: High Voltage Distribution System is an effective method for the reduction of technical losses, prevention of theft, improved voltage profile and better consumer service. It should be promoted to reduce LT/HT ratio keeping in view the techno-economic considerations. A time bound programme for implementation of SCADA and data management system to be obtained from distribution licensees and approved by the SERC's. Efforts to be made to install substation automation equipment in a phased manner.
- vii. Norms for Standard of Performance: Suitable: Suitable performance norms of operations together with incentives and disincentives to be evolved along with appropriate arrangement for sharing the gains of efficient operations with the consumers.
- viii. Setting up of CGR Forum & Ombudsman: State Commission to formulate the guidelines regarding setting up of grievances redressal forum by the licensees as also the regulations regarding the Ombudsman and also appoint/designate the Ombudsman within six months.
- ix. Capacity Building for Consumer Groups: The Central and the State Governments and the Electricity Regulatory Commissions should be facilitating capacity building of consumer groups and their effective representation before the Regulatory Commissions.
- x. Mandate for developing a Power Exchange is given to CERC in the National Electricity Policy.

b). National Tariff Policy

In compliance with section 3 of the Electricity Act 2003 the Central Government notified the Tariff Policy in continuation of the National Electricity Policy.

The issues pertaining to the Tariff Policy are as follows:

i. Return on Equity:

The CERC from time to time would notify the rate of equity for generation and transmission projects. The rate of return notified by CERC for transmission may be adopted by the SERC's for the distribution with appropriate modification taking into view the higher risks involved. The State Commission may consider 'distribution margin' as basis for allowing returns in distribution business at an appropriate time.

ii. Depreciation Rates:

The CERC may notify the rates of depreciation in respect of generation and transmission assets. The depreciation rates so notified would also be applicable for distribution with appropriate modification as may be evolved by the Forum of Regulators. The rates of depreciation so notified would be applicable for the purpose of tariffs as well as accounting.

iii. Implementation of Intra-State ABT:

The Availability Based Tariff (ABT) is to be introduced at State level by April 2006. This framework would be extended to

generating stations (including grid connected captive plants of capacities as determined by SERC).

iv. Time of Day tariff:

Time of Day tariff to be introduced by the SERC's accordingly.

v. Renewable Source of Energy:

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

vi. Status of Determination of Open Access Surcharge:

A consumer who is permitted open access will have to make payment to the generator, the transmission licensee whose transmission systems are used, distribution utility for the wheeling charges and in addition, the cross subsidy surcharge. The computation of the cross subsidy surcharge, therefore needs to be done in a manner that while it compensate the distribution licensee. According to the Tariff Policy the surcharge formula suggested is 'Avoided cost method'.

vii. Harnessing Captive Generation:

Captive generation is an important means to making competitive power available. Appropriate Commission should create an enabling environment that encourages captive power plants

to be connected to the grid. Such captive plants could inject surplus power into the grid subject to the same regulation as applicable to the generating companies.

2) Open Access

Open access has been defined in the EA '03 to mean "*The non-discriminatory provision for the use of transmission lines or the 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.*"

Open Access is seen from transmission and distribution point of view. In transmission open access has been introduced to promote competition amongst generating companies who can now sell to different distribution licensees across the country. This leads to availability of cheaper power. The Act mandates non-discriminatory open access in transmission from the very beginning. In distribution open access is introduced by respective State Commissions for enabling bulk consumers to buy directly from competing generators, competition in the market would increase the availability of cheaper and reliable power supply.

In order to facilitate the introduction of open access in distribution the State Commission need to provide facilitative framework for non-discriminatory open access. This requires

- Load dispatch facilities
- SCADA systems
- Technological up-gradation

3) Power Trading

Perhaps, the most distinguishing feature of the power sector among the various infrastructure sectors is that it does not have a storage value, i.e. it is produced and consumed instantaneously. In a country like ours, where the resources for power generation are so unevenly spread, it is imperative to have a mechanism where the regional surpluses and deficits can be balanced such that there is no demand-supply gap, thereby explaining the rationale behind the concept of power trading.

Power trading affords three basic benefits over conventional long term contracting of power,

- Easier redistribution of surplus and deficits across the system
- Product differentiation
- Economic Pricing

In a long term contracting regime the buyer and seller are locked into a contracting structure that generally does not provide rights to the seller to seek customers for surplus power in case the off-take by the buyer does not use the installed capacity adequately. The buyer of capacity - generally the State Electricity Boards or their successor entities - do not have the incentive or the skills to negotiate commercial contracts with potential buyers duly considering the incremental cost of generation and assessing the surplus available. The lack of forecasting skills and commercial orientation of the buyers results in sub-optimal capacity utilisation, with deficits in certain states or regions even as others have a surplus capacity available.

The historical cost plus approach has also prevented true value of power from being recognised. While the product characteristic of power is undifferentiated, the value of power depends significantly on whether it is firm or infirm, peak or off peak. It also varies by the season of the year. For example the peak power in summer or winter months can have significantly different value as compared to monsoon months.

Power trading allows for these differences to be recognised and results matching of the price and the intrinsic value of power and hence from an economic perspective it is very important that trading in power flourishes in the coming years.

Features of Electricity Act 2003 facilitating power trading

- With enactment of the Electricity Act 2003 the potential of trading would increase further on account of the reasons stated below. The key features of the Act likely to facilitate power trading are,
- Mandatory and non-discriminatory open access
- De-licensing of generation
- Specific provisions for trading of power and market evolution
- Emphasis on non-conventional energy trading
- STU's not allowed to trade in power
- Phasing out of surcharge/cross-subsidy both on open access and on retail tariffs

4) Inter-state/ Intra-State Availability Based Tariff (ABT)

It is a performance-based tariff for the supply of electricity by generators owned and controlled by the central government at present. It is also a new system of scheduling and despatch, which requires both generators and beneficiaries to commit to day-ahead schedules. It is a system of rewards and penalties seeking to enforce day ahead pre-committed schedules, though variations are permitted if notified One and one half hours in advance. The order emphasises prompt payment of dues. Non-payment of prescribed charges will be liable for appropriate action under sections 44 and 45 of the ERC Act.

It has three parts:

- A fixed charge (FC) payable every month by each beneficiary to the generator for making capacity available for use. The FC is not the same for each beneficiary. It varies with the share of a beneficiary in a generators capacity. The FC, payable by each beneficiary, will also vary with the level of availability achieved by a generator.
- In the case of thermal stations like those of NLC, where the fixed charge has not already been defined separately by GOI notification, it will comprise interest on loan, depreciation, O&M expenses, ROE, Income Tax and Interest on working capital.
- In the case of hydro stations it will be the residual cost after deducting the variable cost calculated as being 90% of the lowest variable cost of thermal stations in a region.
- An energy charge (defined as per the prevailing operational cost norms) per kwh of energy supplied as per a pre-committed schedule of supply drawn upon a daily basis.

- A charge for Unscheduled Interchange (UI charge) for the supply and consumption of energy in variation from the pre-committed daily schedule. This charge varies inversely with the system frequency prevailing at the time of supply/consumption. Hence it reflects the marginal value of energy at the time of supply.

There are a good number of reasons why ABT must be implemented within a state. The reasons are listed below

- No penalty for state generators/IPP's or Discoms for deviating from the schedule
- Installed capacities of Captive Power Plants (CPP's) are to be tapped.
- Once the UI is passed to Discoms they will become proactive in managing the load.
- To enhance trading and bring grid discipline among open access customers.
- The responsibility of grid discipline should be shared by SEB's also and not just by the regional electricity boards.

5) Multi Year Tariff

The MYT is essentially a CPI-X price cap on the controllable costs of utilities while uncontrollable costs are considered on a pass-through basis. The assurance to earn reasonable returns and incentives to make investment are based on the investor meeting the efficiency targets, especially those relating to losses.

As per the draft regulation, the multi-year tariff period is called control period that is for five years. However, the first control period is for three years.

Every licensee has to submit the application for Annual Revenue Return for all the years of the control period and an application for tariff of first year of the control period must be made at least 120 days before the commencement of the control period.

The licensee has to file a resource plan containing load forecast and transmission plan (capital investment plan) for all the years of the control period on April 1 of the year preceding the first year of control period.

The monthly transmission tariff per kilowatt of contracted period will be arrived at by dividing the net ARR by 12. This would be further divided by the total contracted capacity.

Licences are entitled to claim variations in uncontrollable items such as axes on income and also other variations on account of factors beyond the control of licensee.

Salient Features of MYT are:

- The basic pricing formula is either CPI-X or the rate of return.
- In adopting CPI-X, distributors should submit forward-looking revenue benchmarks reflecting the requirements of the distributors over the next five years.
- These benchmarks are based on assumptions about efficient levels of expenditure that the distributors would need to incur over the five-year period to meet the target levels of service reliability and quality, expected

demand growth and the cost of capital financing.

- Under the CPI – X price cap approach, the distributors retain the benefits of these favourable outcomes (and incur the costs of any unfavourable outcomes) that occur during the period covered by the initial price caps.
- However, the benefits of favourable outcomes enjoyed in the past regulatory period are to be passed on to the consumer in the first year of the next regulatory period (X0).
- The forward-looking revenue benchmarks are established independent of past revenues on the basis of current and prospective electricity and capital market conditions.
- Returns generated by favourable market conditions (e.g., unanticipated demand growth, reduction in cost of capital) during the first regulatory period are not captured in the process of establishing the revenue benchmarks for next regulatory period.

Costs incurred in MYT can be broadly classified into Controllable and Uncontrollable Cost.

- Some of the Controllable Costs are:-
 - Investment
 - Required Profit (Based on 16% ROE)
 - Electricity Distribution Losses
 - Operation & Maintenance expenses.
 - Financing Cost

- Some of the Uncontrollable Costs are:-

- Generation and Transmission Charge.
- Rent and rates
- Fuel Cost
- Power purchase cost

CHAPTER 5

ANALYSIS

5.1 Present Status of mechanisms and initiatives

There are various achievements which the above mentioned mechanisms and initiatives have managed to reinforce the path towards competitions which are being discussed below :-

1) Government Policy

a. National Electricity Policy: Referring to data in annexure 19 to annexure 27 we have following facts mentioned below:-

- i. Grid Code: As per the table in Annexure I. Out of the 17 SERCs formed, only 12 SERCs have notified their respective State Grid Code. AERC, GERC, MPERC, UPERC as followed the deadline according to NEP. UPERC is an exception case, its old regulation was approved.
- ii. Technology Up-gradation: The state commissions have to ensure that technology upgrades match the facilities available with RLDC are provided at the state level, where necessary and realized not later than JUNE 2006. As per the table in Annexure II, WBERC has facilities of SLDC that matches to that of RLDC. Majority of the SERC's are in the final stage of upgrading their SLDC's.

- iii. Open Access Transmission charges and Distribution charges:
Open Access in distribution is one of the main features of the Electricity Act 2003 that builds a conducive environment for competition. As per the table in Annexure III only 13 SERC's have notified the charges.
- iv. Time bound program on AT&C losses: The data in table Annexure IV depicts 12 SERCs have furnished a prudent time-bound programme for the segregation & reduction of AT&C losses. The SERC's have directed their respective DISCOM's to prepare a road map to reduce the losses in the coming years. Consultants have been appointed and energy audits are being planned and performed.
- v. Metering Plans: As per table in Annexure V - a, 13 SERC's have furnished the details of the metering plans. According to the table in Annexure V - b, the SERC's have improved in the metering of 11kV feeders from 2001-02 to 2005-06, but the same cannot be said about the metering at the consumer level, the percentages of meterization are not up to the mark.
- vi. Implementation of SCADA, HVDS and Database management: As per the table in Annexure VI, 10 SERC's have given details of implementation.
- vii. Norms for Standard of Performance: As per the table in Annexure VII, 17 SERC's have notified the regulation for distribution Standard of Performance. The rest 3 SERC's are yet to notify the regulations. WBERC has appointed a

consultant for the process and as targeted to implement by 2008-09.

viii. Setting up of CGR Forum & Ombudsman: As per the table in Annexure VIII, 18 SERC's have notified the regulations w.r.t Consumer Grievances Forum & Ombudsman. KSERC has notified draft regulations in 2007, and J&KSERC has no such provision.

ix. Capacity building of Consumer Groups: As per Annexure IX, 7 SERC's have been actively promoting Capacity building of Consumer Groups.

b. National Tariff Policy : Referring to data in annexure 11 to annexure 18 we have following facts mentioned below:-

i. Return on Equity: As per the table in Annexure I, 10 SERC's have approved 14% ROE for their respective distribution licensees. APERC has used Return on Capital Employed (ROCE) methodology. OERC has approved 16% ROE and AERC observed that overall performance of DISCOM's is not satisfactory and has approved 3% ROE for their respective distribution licensees in their latest Tariff order.

ii. Depreciation: As per the table in Annexure II, 10 SERC's have adopted the depreciation rates specified by CERC. OERC has not adopted the depreciation rates specified by CERC; OERC has adopted a weighted average of 3.67% in RSTO 24-06-03. OERC has been directed by High Court to

depreciation rates calculated for assets in accordance with the state Governments.

- iii. Implementation of Intra-State ABT: As per the table in Annexure III, GERC, KERC, and UERC have issued orders. Draft has been circulated by JSERC, KSERC. Discussion paper published by MERC. Draft concept paper prepared by TNERC, OERC has prepared draft regulations and WBERC has issued a set of regulations.
- iv. Time of Day Tariff: As per the table in Annexure IV, 10 SERC's have introduced Time of Day tariffs. TOD tariff has been introduced mostly for the HT consumers. CSERC has introduced TOD tariff but, it is optional applicable to all the HT consumers but not for CPP.
- v. Renewable Source of Energy: As per the table in Annexure V, 10 SERC's have notified their respective percentage of power to be procured from renewables. UERC has notified the highest percentage of power to be procured - 100% purchased ahead of merit order from small hydro less than 25MW and TNERC 10% from non conventional sources. 9 SERC's have determined the tariffs for NCE sources.
- vi. Status of determination of Open Access Surcharge: As per the table in Annexure VI, 11 SERC's have computed their respective surcharge values. It can be seen that the surcharge, as determined by some of SERCs was very high (in the range of Rs.1.50 to Rs.2.00 per unit) making the open

access a non starter.

- vii. Harnessing Captive Generation: As per the table in Annexure VII, 9 SERC's have notified the status for the recommendations given by the Forum of Regulators for Harnessing Captive Generation.

2) Open Access

As per the Present Scenario:

- Open Access in ISTS is already sought after.
- SLDC to take care about Open Access within the state.
- Day-ahead market is already in place. (Due to ABT)
- Balancing market is in operation. (Through UI)
- Transmission charge has a paradigm shift- from usage based (pre-ABT) to access based (post-ABT).

The SERCs of twenty States namely Assam, Andhra Pradesh, Chattisgarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttaranchal, Uttar Pradesh, and West Bengal have issued open access regulations specifying the phasing details for grant of open access and conditions for introduction of open access in distribution and one State namely, Tripura has issued draft regulations.

It can be learnt from the table in Annexure 9 that thirteen State Commissions have notified their respective Transmission charges and Wheeling charges for open access. Ten State Commissions have computed their respective surcharge for open access. UERC and UPERC are computing their surcharges on case-to-

case basis. MERC has come up with a surcharge that is ZERO, has the reason quoted by them is that their current level of cross-subsidy surcharge for MSEDCL, REL, TPC area is zero.

As per the Annexure 8 majority of the State Commissions have adopted the methodology for the calculation of the surcharge has specified in the National Tariff Policy.

It is important to know about the number of cases made available for granting open access. As shown in Annexure 10 it is learnt that in all there are 29 cases that have been approved. Out of these 29 cases CSERC and RERC taking the first and second position with four and three cases implemented respectively, in addition to the four cases of open access implemented in CSERC, 16 old cases have been rewarded. It is interesting to note that MPERC has 11 open access cases approved but only one case implemented for a captive consumer, reasons for the poor convertibility are unknown.

3) Power Trading

As on 31.3.2006, the Commission has awarded inter-state trading licences to 19 companies. These licences have been awarded for various categories i.e. from A to F which are provided in annexure 4. At present, only 7 licensees have been undertaking trading in electricity. These are provided in Annexure 3.

As per the Annexure 3 the seven licensees which are undertaking trading have traded the total volume of electricity of 14188.31 Million KWhs during 2005-06. Of the total volume, 58.90% 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 MUs in 2003-04 to 14188.31 MUs in 2005-06 registering a growth of 29%. 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 2005-06.

The trading licensees have purchased 51.29% of the total volume from only four selling entities (WBSEB, GRIDCO, APPCC/APTRANSCO, and JTPCL) and sold 52.64% of the total volume to only three buying entities (MSEB, MPSEB and PSEB) during 2005-06.

The sale price has increased during 2005-06 as compared to the year 2004-05. At price range of Rs 2 – 2.50, 70% of the volume was traded during 2004-05 whereas at the same price range only 1.68% of the volume has been traded during 2005-06. About 60% of the volume has been traded at the price range of Rs 3 to 4 during the year 2005-06 whereas it was 4.75 during 2005-06. Maximum sale price was Rs 3.30 during 2004-05 whereas it was Rs 4.75 during 2005-06. Substantial increase in the prices of traded power indicates shortages that are prevailing and that the demand is less elastic to prices. There is a substantial increase in the prices of traded power indicates shortages that are prevailing and that the demand is less elastic to prices.

However, this traded power is between 2 to 3 per cent of the total electricity generation.

4) Inter-state/ Intra-State ABT

Inter-state ABT is being implemented among the Central Utilities and Intra-State ABT as per the table in Annexure 14, GERC, KERC, and UERC have issued orders. Draft has been circulated by JSERC, KSERC. Discussion paper published by MERC. Draft concept paper prepared by TNERC, OERC has prepared draft regulations and WBERC has issued a set of regulations.

5) Multi Year Tariff

MYT is being implemented in AP, MP, Maharashtra and other states are gearing up to implement MYT.

5.2 Challenges and Issues

There are various bottle necks and challenges associated with the above mentioned mechanisms and initiatives associated to achieve competitions which are being discussed below :-

1) Open Access

From the above status quo we can figure out that with regulations in place for availing Open Access in most of the States there are ground realities regarding implementation of Open access and its feasibility in terms of

- Cost to avail Open Access

There are strong perceptions that the Open Access Charges to avail Open Access is very high then the normal rates which the consumer going for Open Access pays to the Local Discoms these charges serves as deterrent for availing open access by the consumer..

- T&D loss levels

Since the Open Access consumers have to bear the line losses, the high T&D loss in the network prevalent in Indian electricity sector makes Open Access Un-economical and kills the lucrativness of non-discriminatory choice of supplier.

- Operational Constraints

There are number of Operational Constraints to be faced by Utilities at present which make hem incapable to provide services to open Access Consumers some of them are enlisted below.

There are various issues in exercising consumer choice through Open Access

under Section 42 (2), some of them are enlisted below :-

- i. After getting freedom of choice, whether the consumer has to
 - Separately apply for Open Access path clearance
 - Sign agreements with network owners etc.
 - Pay Open Access Charges separately in addition to wheeling charges
- ii. Billing of Open Access consumer
- iii. Charges to be paid by the supplier of Open Access consumer to the Discom/ SEB
- iv. Whether the Open Access Consumer is required to give day ahead drawl schedule.
- v. Wheeling charges payable by Open Access Consumer.
- vi. Right of Open Access Consumer as Network use of Discom.
- vii. Treatment of T&D losses for Open Access Consumer
- viii. Obligation of Discom to resume supply to Open Access Consumer who chooses to Come Back.
- ix. Reactive Energy Charges for Open Access Consumer.

To explore the ground realities regarding implementation of Open access and its feasibility in terms of

- Cost to avail Open Access
- T&D loss levels
- Operational Constraints

2) Power Trading

Enhanced trading volumes would pose several strong challenges that the market participants would need to gear up and meet, some of them are:-

i. Role of Government

The Act in its current form vests enormous responsibility in the Central and State governments and the regulators at the State and Central levels in formulating policies and implementing them. While the Act conveys the intent of the policy formulators, the details of the policies would need to be carefully worked out by the Governments (and to an extent the CERC, which is also enjoined with certain policy formulation responsibilities). Lack of specificity in details and inappropriate policies could severely impair the trading framework.

ii. Role of regulators

The regulators have very important implementation of the new arrangements in terms of ensuring open access, fixing surcharge levels and trajectories, pricing of access and ensuring that the operators do not exert market power. The settlement rules developed have to be vetted by the regulator to ensure that accounting settlements are transparent and there is no crisis in the market.

iii. Role of grid operator and STUs

Grid operators and STUs would have key responsibilities in planning ahead of time to ensure that adequate capacity is available to facilitate trading in an economic and efficient manner since transmission availability is the backbone of trading. The SLDC/RLDC/NLDC would also need to ensure that the principles of least cost dispatch are strongly adhered to. It is also likely that these agencies would be enjoined with the responsibility of developing and operating settlement arrangements.

- iv. What type of Power Exchange will be set up to cater to real time trading of electricity in near future.

3) Inter-state/ Intra-State ABT

There are a different set of problems when it comes to implement ABT at state level. These are discussed below

- i). all the HT interface points and other interface points except points with PGCIL do not have ABT compliant meters which is necessary for implementation of intra-state ABT which a must as UI charges is one of the component of open access charges for consumer.
- ii) The system lacks demand side management tools to implement Demand control.
- iii) Demand Forecasting: The problems in this area are :-
 - Discoms doesn't have advanced Demand forecasting tools
 - Nor does it have historical data to study demand patterns
 - Only SLDC to a certain extent has the above capabilities

iv) UI pass through:

At present the complete power purchase cost of Discom is being passed on to consumer via retail tariff. Hence there is no incentive or penalty for Discom to comply with ABT regime.

4) Multi Year Tariff

The key issues that need to be addressed in the implementation of MYT include:

- i. Basic framework of MYT to be adopted
- ii. Length of control period
- iii. Allocation of risks and pass through principles;
- iv. Incentive and benefit sharing mechanisms
- v. Process aspects of MYT implementation.

Several subsidiary matters need to be addressed including:

- Whether the entire over-performance or under-performance should be allowed as incentive or penalty;
- If the entire amount is not allowed as incentive (or penalty), what proportion should be allowed to be retained by the Licensee;
- Whether incentives and penalties should be symmetric – i.e., in the same proportion for better or adverse performance;
- Whether there should be any caps and collars for the profits or losses.
- Whether there should be any reserves to be maintained for future tariff adjustments (similar to tariff and dividend control reserves); and

- Whether the existing provisions on other reserves (like contingency reserve) need to be Sharing of the profits (or losses) above the standard allowable return is likely to mitigate the checks and balances for both the consumer and the utility

5) Installation and commissioning delays and problems

From the past targeted capacity addition vs actual capacity addition achieved we can see that in 8th & 9th plan only 50% and in 10th plan till 31.12.06 only 43.16% of the targeted capacity addition achieved, these underachieving of targets are due to various reasons depicted in annexure 5 and mentioned below:-

- i) Delay in technology know-how tie up by suppliers, EPC companies etc.
- ii). Geological Surprises mostly prevalent in Hydro Power Generation
- iii). Natural Calamities mostly prevalent in Hydro Power Generation
- iv). Delay in award of works due to Red-tapeism in government bodies
- v). Delay in MoE&F clearance due to Red-tapeism in government bodies
- vi). Investment decision/ Funds tie up constraints/ delay in financial closure mainly due to lack of collateral guarantees specially in case of Private project owners, State Utilities.
- vii). Delay in Preparation of DPR & signing of MOU with state govt.
- viii). ESCROW cover (Private Sector)
- ix). Court Cases
- x). Law & Order problem
- xi) R&R issues

CHAPTER 6

MEASURES AND RECOMMENDATION

1) Open Access

In order to provide power to consumer through open access there is a need for reinforcing T&D infrastructure and reduce other components such as

- i. To reduce T&D losses and the open access consumer should bear losses at his supply price and not at Discom supply price.
- ii. To have real time monitoring of supply of Open access consumer (intra-state ABT)
- iii. 100% and technology compliance metering involving time differentiated Special Energy Meters needed for open access whose cost to be recovered upfront from consumers.
- iv. Stricter and easy methods for remittance to improve to cent percent collection efficiency
- v. The consumer should enjoy all right and privileges regarding network use at par with the embedded consumer.
- vi. To reduce Cross-Subsidy
- vii. To reduce Tariff slabs in order to ease tariff rationalization.
- viii. Provisions to provide incentives for saving in consumption of reactive energy and Discom should bill for Reactive Energy charges at par with the embedded consumers.

- ix. Wheeling charges exclusive of losses at particular voltage level to be levied based on charges approved by SERC in ARR and should be based on postage stamp rate on the basis of actual energy billed.
- x. The Overdrawal and Underdrawal should be priced at frequency liked UI rates with a permitted band of sanction Load

2) Power Trading

a) Role of Government

There would be inevitable pressures from existing utilities for protecting their interests and the policy framework would need to take objective view of the whole scenario in formulating the policies

b) Role of regulators .

The regulators should shore up their current capabilities very significantly and this poses a serious challenge

c) Role of grid operator and STUs

A significant organisational change and capability development is required

d) Power Exchange

The Features of Power Exchange is being decided as per CERC guidelines on January, 2007.

3) Inter-state/ Intra-State ABT

- i. There should be ABT compliance meters at every Interface

points.

- ii. Demand Control : Possible means of Demand control that can be used by SLDC are. Analyzing the average realization from a substation area and compare it with system marginal price before load shedding Influence demand by using proper tariff structure
Use demand side management tools
- iii. Upgradation of Metering and Billing systems : There is a need to convert/add 0.5 class accuracy meters to 0.2 class meters at Discom- Transco Interface. Instrument transformers are needed to be replaced.
- iv. There is a need for reliable communication means to connect substation, generating plants, open access customer interface point with SLDC. Hardware and software is required to consolidate data and produce bill.
- v. The Discoms should build up their database containing historical data and use proper forecasting technique to forecast demands accurately.
- vi. The technology implemented at ULDC level should be at par with that of at SLDC and RLDC to generate real time data.
- vii. There should be incentive and penalty for Discom to comply with ABT regime.

4) Multi Year Tariff

- i. Instruments of multi-year tariffs (MYT) regulation should need to be precisely defined with little room for discretion and alternate interpretation may exist.
- ii. The form of MYT implemented should be clearly defined and preferably be formulaic in design. The approach should envisage little regulatory intervention during a control period, particularly in the determination on the revenue allowances
- iii. The framework should be kept simple and practical. Unlike the practice in several international jurisdictions it may not be feasible to define the tariff ceilings and let the utilities determine the actual tariffs to be charged. This is primarily on account of the wide divergence between the tariffs and the costs. Hence the Regulatory Commission may have to determine the retail tariffs for each category. The MYT framework should initially focus on the computation of the revenue allowance rather than on retail tariff formulation across a multi-year period
- iv. Costs external to the utilities should be allowed as a pass through. Such costs may be defined clearly in advance as a part of the overall MYT framework.
- v. The MYT framework should feature sufficient incentives to encourage utilities to improve upon the regulatory targets. This would benefit both the utilities and the consumers
- vi. The initial starting point in determining the revenue allowance and the improvement trajectories should be recognised at "actual"

levels and not the “desired” levels.

- vii. Benefit sharing mechanisms between utilities and consumers may be integral part of the MYT framework
- viii. The MYT framework should be applied for both public and private utilities
- ix. Appropriate regulations may be framed by the State Commission for implementing the MYT framework duly considering the guidelines provided in the National Electricity Policy and Tariff Policy.
- x. State Commissions should decide and segregate controllable and un controllable components of tariff with consultations with Stake holders

The length of the control period for MYT is an important aspect to be decided upon.

CHAPTER 7

CONCLUSION

Considering the complexity of the power sector reform challenge, greater emphasis should be put on the formulation of true privatization strategies and corporatization of State Electricity Board's Utilities were in each Utility act as individual profit centre, which are much broader than transaction plans or paper reforms. These strategies must deal explicitly with risk exposure during the transition period to the time that the financial and technical performance of the utilities businesses approach commercially viable standards and, in particular, their cash-flows become strongly positive. This cannot be merely achieved by lifting barriers to entry and changing the rules but to promote the drivers of competition and resolve the challenges associated with it which we have been analysed in this report. One among these drivers to move towards competitive market is Open access in transmission and distribution which has capability to open up hitherto constrained power market wherein the electricity flowed under the single buyer model. Thus enabling an environment for competition and growth of Indian Power market into a multi buyer model in the near future

Based on the above mechanisms and initiatives for promoting competition a score card is prepared involving data of 19 states, the summary of it is provided in Annexure 2 along with the score card in Annexure 29 From the values obtained from the score card it has been evident that an era of competition has ensued in most of the states by issuing regulations and time frame for introduction of open access in their state but lot more has to be done

- to prepare infrastructure to promote competition at retail level by uplifting ULDC so that ABT can be implemented at state level and many states are still in conceptual phases or else have implemented at some consumer slabs.
 - to bring commercial viability by reducing cross-subsidy to acceptable levels which is presently too high hovering above 126 paise in most states, this can be only done by moving towards cost of supply.
 - to provide policies promoting captive generation
- and 10 states having Grade above the average grade of 22 comprising of states like Gujarat, Chattisgarh, Karnataka, A.P., Maharashtra, Orissa, Rajasthan etc. are trying hard to move towards competitive environment followed other states which are trailing behind. But the average grade of 22 out of 50 depicts that still lot more restructuring has to be done to bring proper competition in this sector.

BIBLIOGRAPHY

Ando, A., and K. Palmer. 1998. *Getting on the Map: The Political Economy of State*. Discussion Paper 98-19. Resources for the Future.

Arny, M. 1996. The Retail Energy Services Company Model for Restructuring the Electric Utility Industry. *The Electricity Journal*, January/February.

Black, B. 1994. A Proposal for Implementing Retail Competition in the Electricity Industry. *The Electricity Journal*, October.

Brennan, T., and K. Palmer. 1996. *A Shock to the System: Restructuring America Electricity Industry*. Resources for the Future.

Citizens for a Sound Economy Foundation. 1995. *Customer Choice, Consumer Value: An Analysis of Retail Competition in America Electric Industry*. The University of Clemson Department of Economics.

Fox Penner, P. 1997. Electric Utility Restructuring: A Guide to the Competitive Era. *Public Utilities Reports*.

Hunt, S., and G. Shuttleworth. 1996. *Competition and Choice in Electricity*. John Wiley & Sons.

Report on power sector, sourced from
<http://planningcommission.nic.in/data/dataf.htm>

Report on Development of Indian Infrastructure, sourced from
http://planningcommission.nic.in/reports/genrep/rep_infra.pdf

Source – Assam Electricity Regulatory Commission: www.aerc.nic.in

Source – Andhra Pradesh Electricity Regulatory Commission:
www.ercap.org

Source– Central Electricity Authority: www.cea.nic.in

Source– Central Electricity Regulatory Commission: www.cercind.org

Source – Chattisgarh State Electricity Regulatory Commission:
www.cserc.nic.in

Source – Delhi Electricity Regulatory Commission: www.dercind.org

Source– Eastern Load Dispatch Centre: www.erldc.org

Source – Gujarat Electricity Regulatory Commission: www.gercin.org

Source – Himanchal Pradesh Electricity Regulatory Commission:
www.hperc.nic.in

Source – Jharkhand Electricity Regulatory Commission: www.jserc.org

Source – Jammu & Kashmir Electricity Regulatory Commission:
www.jkserc.nic.in

Source – Karnataka Electricity Regulatory Commission: www.kerc.org

Source – Kerala State Electricity Regulatory Commission:
www.erckerala.org

Source – Madhya Pradesh Electricity Regulatory Commission:
www.mperc.org

Source - Maharashtra Electricity Regulatory Commission:
www.mercindia.com

Source- Ministry of Power: www.powermin.nic.in

Source- National Association of Regulatory Utility Commissioners:
www.naruc.org

Source- Northern Load Dispatch centre: www.nrldc.org

Source - Orissa Electricity Regulatory Commission: www.orierc.org

Source- Power Finance Corporation: www.pfcindia.com

Source- Planning Commission: www.planningcommission.nic.in

Source- PTC Limited: www.ptcindia.com

Source - Punjab Electricity Regulatory Commission: www.pserc.nic.in

Source- Government of Rajasthan, Department of Energy:
www.rajenergy.org

Source - Rajasthan Electricity Regulatory Commission:
www.nerc.gov.in

Source- Southern Load Dispatch Centre: www.srldc.org

Source - Tamil Nadu Electricity Regulatory Commission:
www.tnerc.tn.nic.in

Source- The energy research Institute: www.teriin.org

Source – Uttaranchal Electricity Regulatory Commission: www.uerc.in

Source – Uttar Pradesh Electricity Regulatory Commission:
www.uperc.org

Source – West Bengal Electricity Regulatory Commission:
www.wberc.net

Source – Western Load Dispatch Centre: www.wrldc.org

ANNEXURES

Annexure-1

Progress of Capacity Addition in States through Competitive Bidding

Northern Region

Rajasthan : There is a issue of fuel linkages or allocation of captive mines in respect of sites identified by Independent Power Producers (IPPs). Apart from IPPs, state government is in process of inviting joint venture partners for Gudah Lignite project of 125 MW.

Punjab: Crisil has been engaged for preparing bid documents for 1000 MW power project under International Competitive Bidding (ICB) guidelines and the document is expected in two months time. Punjab has a current peaking gap of over 2000 MW. Considering the load growth of 10% per annum by the end of Eleventh Plan, over 6000 MW would be required to be made available by way of capacity addition. Out of this, around 2000 MW would be available from the central sector projects coming up in the northern region and remaining 4000 MW will be planned under state and private sectors.

Delhi: At present, two projects namely Bawana Gas (1000MW) and Pragati CCPP (330 MW) are in the pipeline. However, there is an uncertainty about the tendering process as availability of gas is not certain. One of the options which

is being considered by the distribution companies include studying the feasibility of having a joint venture project at pithead location. The requirement of power by distribution companies and its growth is required to be considered by the state government for having commensurate plan for capacity addition through ICB route.

Uttar Pradesh : In respect of Anpara 'C' project, competitive bidding process has been adopted and Request for Proposal (RFP) has been finalized which is awaiting approval. Bids in respect of the project are likely to be opened in three months' time and this project is likely to be fully operational in 2010. Similar process is likely to be adopted in case of Harduaganj project. Further, a follow up workshop is expected to be organized wherein the information with regard to process followed in respect of Anpara C would be disseminated to other states after the RFP invitations had been issued by UP.

Haryana: Apart from Yamunanagar thermal power plant (TPP), there is no concrete plan for capacity addition under the state or private sector during the course of Eleventh Plan.

Western region

Madhya Pradesh : Though considerable work has been done on the transmission side, not much has been done for adding generation capacity. A 1000 MW coal based project (Malwa TPP) in the state sector is in pipeline for which detailed project report (DPR) has been finalized and bidding for the project on turnkey

basis would be done in two months. Further, stage I environmental clearance had been received. Equity of about Rs 12 billion would be provided by the state government.

Following project sites which have been cleared by the CEA are being planned to be developed in near future through the bidding process.

- **500 MW Byohari** : Request for Qualification (RFQ) is expected by October 31, 2005.
- **1000 MW Sidhi** : This project is proposed to be developed as IPP project and complete bids would be invited. Essar Limited has expressed interest in the project.
- **360 MW Jhabua CPP** - This project is proposed to be developed by Aban Loyd in the private sector (IPP). There is, however, an element of uncertainty in the availability of gas for this project.
- **Shapurpura** : This project, proposed to be developed on coal, is facing the problem of coal linkage.

Maharashtra : After receiving the go-ahead from MERC, action has been initiated for taking up 1324 MW of base load capacity addition and 700 MW of peaking capacity addition. These projects are being developed under case-I of the guidelines and not for specific projects. The RFQ and RFP documents are ready. The state government is also examining capacity addition of about 5000 MW in each of the following scenario:

- Capacity addition through expansion of existing power stations;
- Possibility of Joint-venture projects for undertaking the expansion,
- Green field project-Identification of developers.

Chhattisgarh: A thermal power plant of 600 MW capacity is proposed to be implemented for which the DPR has already been made. The state government is planning to apply competitive bidding guidelines for this project on which decision would be taken in due course. A joint-venture for 1000 MW project with IFFCO is also in the pipeline where 26% equity share is expected to be held by state government and 74% equity is to be held by IFFCO.

Southern Region

Karnataka : Issue regarding implementation of ICB guidelines is still being examined and it may take some time to firm up the procurement of electricity through this process. It is being apprehended that immediate implementation of these guidelines would delay the process of execution of projects which are in the pipelines.

Hydro potential of the state has already been fully realized and with persisting problems regarding identification of coastal sites at western coast due to environmental angle, state is facing difficulty in identification of new sites. Nagarjuna is being considered as an expansion project and Memorandum of Understanding (MOU) has been entered into with ONGC for a site near

Mangalore.Karnataka Power Corporation Ltd (KPCL), being a good company and in a position to prepare pre-feasibility reports in respect of perspective sites is expected to create a shelf of projects and develop sites which in turn could be bid out to prospective developers on payment basis. Demand from discoms would be assessed in next one month time and feasibility report in respect of potential sites would be prepared by KPCL with the help of Central Electricity Authority (CEA).

Andhra Pradesh : Currently, 1700 MW worth power projects are at various stages of implementation and another 1600 MW (2x800 MW) at Krishnapatnam is being planned.

Tamil Nadu : Ennore and Tuticorin coastal sites of 1000 MW each on imported coal is being planned as Joint Venure projects. In addition to this, a gas based project of 500 MW near Chennai and Cheyyur thermal power station (2x800 MW) is being envisaged to be developed during the Eleventh Plan period.

Annexure 2

Creation of competitive environment

Assam

One of the fundamental preconditions for creating a competitive market place, unbundling the sector on functional lines and separation of trading and transmission functions has already been completed with the State separating the generation, transmission, distribution and trading functions. However, as far as information is available with ICRA, competitive bidding for power has yet to commence in the state. AERC has come out with regulations on allowing open access in transmission and distribution of power. As per the time table, open access for smaller customers with connected load above 1 MW will be completed in a phased manner by December 31, 2008. Companies availing of open access shall pay transmission charges, wheeling charges, Cross Subsidy Surcharge (CSS) and an additional surcharge payable to the discom for meeting its fixed costs. As per AERC, CSS is to be computed so as to meet the current level of cross-subsidy for that category of customer. However the exact amount has yet to be notified. CSS would however not be payable by the captive consumers. As far as electricity duty is concerned, ASEB officials have informed us that the ED is nondiscriminatory to captive generators. The Assam Transco has yet to implement ABT as meters are yet to be installed. However, they expect it to be implemented within a year's time.

AP

Andhra Pradesh entered its reform phase in 1999 with the unbundling of APSEB into two entities viz. APGENCO handling the generation function while APTRANSCO handling the transmission and distribution of power in the state.

As per second transfer scheme, APTRANSCO was unbundled into five entities on 1.4.2000 whereby APTRANSCO retained the transmission function while the distribution activity in the state was transferred to four distribution companies – AP East PDCL, AP Central PDCL, AP South PDCL and AP North PDCL. Further, as per the mandate of the EA 2003, the procurement and bulk supply of power and trading of power and PPAs were transferred to the four distribution companies on 9.6.2005 as per the third transfer scheme notified by GoAP.

The state regulator, APERC, has already notified an ‘Open Access Policy’ and the first phase is already being implemented. Charges under open access policy have also been notified. At the current levels of cross-subsidy surcharge, wheeling and other charges applicable to the open access consumer in A.P., it works out much more expensive than the grid tariff, even after assuming that HT consumers are able to procure power from third sources at rates as low as Rs. 2.25/kwh. Such high level of charges hinders the actual implementation of the ‘Open Access Policy’ in the state, which could have ushered in a competitive market scenario. However, considering the level of current charges, it is favourable for high power consuming consumers to go for captive generation provided they are able to generate or procure power at reasonable levels (e.g. below Rs. 3/kwh). The position would become even more favourable in case the captive plant is located at the site of the consumer and no wheeling charges are being paid.

On an overall basis, though the policy framework for creating a competitive environment in power sector in the state exists, a revisit of the charges relating to open access in the state is required before a large-scale implementation of the policy can be achieved.

Chattisgarh

CSERC has issued regulations for open access in the state with users requiring 10 MW or above eligible for open access from April 1, 2006. Users requiring 1 MW and above will be allowed to opt for open access from April 1, 2008. However, there is no provision for open access for less than 1 MW. Based on the charges defined for open access at 132 KV, it is relatively cheaper for these consumers to opt for power purchases through open access than from CSEB. This will also force the CSEB to reduce tariffs to match open access tariffs, resulting in higher tariffs for cross-subsidised categories. GoCG has also been proactive in notifying a captive power policy that allows a number of industrial consumers like Jindal Steel & Power, BALCO and Lafarge to set up captive power plants.

Delhi

Though, the power sector in Delhi has been unbundled on functional lines with a separate transmission company, two generation companies and three distribution companies, the crucial separation of trading function is still to be separated from the transmission company. Further, the Delhi Electricity Regulatory Commission (DERC), though in existence for over six years, is yet to formulate an open access policy that would enable large customers in Delhi with an option to buy power from sources other than their respective distribution companies. On the whole, Delhi still has a long way before a truly competitive environment is established in the state.

Gujarat

One of the fundamental preconditions for creating a competitive market place, unbundling the sector on functional lines and separation of trading and transmission functions have been completed and the DISCOMs have started

independent functioning from 1st April 2005. Each of the DISCOMs have their own CM&D and the employee transfers have also been completed. As a further step towards encouraging competition, a fair amount of progress has been made towards implementing intra-state ABT. While the GERC has come out with an order dated 14th February 2006 laying down the rules and guidelines, the plans regarding interface locations and nos. of ABT meters required has also been finalised in consultation with PGCIL. The orders for purchase of 870 nos. meters has been placed and installation is expected to start from the first week of May 2006. In the second phase, tariff will be finalised, market structure will be formed and the existing PPAs made ABT-compliant. The Captive Power Policy of the Gujarat Government does not levy any discriminatory duty on Captive generation , wheeling charges are 13.5 paisa and 21 paisa respectively for power delivered at EHV and HV respectively.

The latest tariff order issued by GERC has specified the following charges for open access consumers availing open-access on a long term basis :

Transmission charges : Rs. 2832 / MW / day

Energy loss : 4.27%

Wheeling charges : Rs 2459 / MW / Day

Losses in kind : 10.01% at 11 kV level

Cross Subsidy surcharge : Rs 1.35 / unit

Thus , for a consumer with a load factor of 60% , the total charges payable will work out to around Rs 1.75 / unit , and given the high grid tariffs in Gujarat, open access may not be hindered provided the consumer is able to source power at competitive tariffs

Haryana

The Haryana State Electricity Board (HSEB) was one of the first SEBs to be unbundled on functional lines into a generation company, a transmission company and two distribution companies. Subsequently, the trading function has been separated out from transmission. The generation company (HPGCL) is handling the trading function in the state from June'05. In order to introduce competition, HERC has notified the 'Open Access' regulations for the state, which would allow large consumers the choice of power supplier starting from October 2006. However, the regulator is yet to frame policy regarding levying of various charges under the said policy, in whose absence no clarity regarding the viability of the open access policy can be ascertained.

HP

One of the fundamental preconditions for creating a competitive market place , unbundling the sector on functional lines and separation of trading and transmission functions has not yet been completed. It has obtained extension from the Government of India for restructuring of HPSEB and continuation of HPSEB as the state transmission utility and the licensee till June 9, 2006. However, HPSEB has drawn up a proposal for restructuring of the Board into three corporate entities – for generation, transmission and distribution.

On the positive side, HPERC has issued regulation on terms and conditions on open access in June 2005. Open access to consumers with contract demand above 1 MVA but not exceeding 2 MVA has been allowed from April 1, 2007, and for consumers with connected load less than 1 MVA open access shall be introduced as and when regulations for the same are notified by HPERC. HPERC, is , however, yet to come out with specific wheeling or cross –subsidy surcharge for

open access consumers, only the broad principles have been laid down and the extent to which open access is facilitated in the state therefore, will be evident only when a few orders are passed .

HPSEB has received two applications so far on long term open access – from M/s. Gujarat Ambuja Cement Ltd. & M/s. Himachal Cement Plant. These applications are under consideration by HPSEB. Further, HPSEB has already allowed an industrial consumer to wheel power for captive use from Solang Hydro Electric Power Project in District Kullu with an installed capacity of 1 MW to its industrial unit in Paonta Sahib. The state does not levy any electricity duty on power generated from captive diesel power stations , the GoHP in fact provides some incentives in respect of captive power to investors in hydro projects up to 5 MW capacity, for instance Electricity generated from Micro Hydel Power Projects consumed by the party itself in any of its industries shall be exempted from payment of electricity duty for a period of five years from the date of commissioning of the plant. There has, however, been no progress in areas like introduction of intra-state ABT or procurement of power through competitive bidding.

Jharakhand

JSEB has not yet unbundled JSEB along functional lines, as mandated by the Electricity Act, 2003. JSERC has issued regulations for enabling open access in the state in June 2005. However, due to the lack of adequate transmission and distribution infrastructure in the state, the Commission has not notified the charges that would be applicable for an open access customer. GoJ has notified a captive power policy that encourages the setting up of captive power generation

plants of any capacity to meet the existing as well as future demand for power of industrial units. The policy also provides for sale of power to JSEB, wheeling it to open access customers and banking of power with JSEB. In addition, GoJ provides a captive power generation subsidy to plants set up in 100 per cent export-oriented units as well as plants set up by SC/ST Entrepreneurs, women entrepreneurs, handicapped persons and ex-service men.

Karnataka

Karnataka's state power sector comprises a transmission company, two-generation companies and five distribution companies. The state was one of the first ones to unbundle its power sector and the initial unbundling process started in 1999. Further, as per the mandate of the Electricity Act 2003, the procurement and bulk supply of power and trading of power and PPAs were transferred to the distribution companies on June 10, 2005 as per the Govt. of Karnataka Order dated May 10, 2005. In order to usher in competition and comply with the requirements of the Electricity Act 2003, KERC has already notified the 'Open Access Policy' for the state whereby consumers having a contracted demand above 5MW and connected at 33Kv level are able to choose their power supplier. At the current levels of cross-subsidy surcharge, wheeling and other charges applicable to the open access consumer in Karnataka, the economics is in favour of the open access consumer provided they are able to source power at low rates (such as below Rs. 3/kwh). However, the current low cross-subsidy surcharge at Rs. 1.15/kwh is based on average cost of supply, which may undergo a change in case KERC sets such charges based on voltage level cost of supply.

Kerala

The state of Kerala continues to follow an integrated model whereby all the three functions of generation, transmission and distribution are handled by KSEB. In order to usher in competition and comply with the requirements of the Electricity Act 2003, OERC has already notified the 'Open Access Policy' for the state whereby consumers having a contracted demand above 10 MW are able to choose their power supplier.

Maharashtra

Maharashtra State Electricity Board (MSEB) has been unbundled w.e.f. April 1, 2005 into four entities; a holding company, a generation company, a transmission company and a distribution company. The trading activity has been separated out of the transmission function and is at present carried out directly by distribution company, Maharashtra State Distribution Co. Ltd. In order to introduce competition, HERC has notified the 'Open Access' regulations for the state on June 21, 2005, according to which customers having a contracted load of 2 MVA or above are already being allowed open access.

However, the regulator is yet to frame policy regarding levying of various charges under the said policy, in whose absence no clarity regarding the viability of the open access policy can be ascertained. Further, Maharashtra has formulated captive power policy based on the guidelines issued by MERC. The captive power policy of the state is favourable as the consumer availing captive power is required to pay only Rs. 20/KVA per month as grid back-up charges.

MP

MPERC has issued regulations on open access that allowed open access for users requiring 10 MW or from June 2005. The introduction of open access has been phased such that user requiring 1 MW or above would be eligible for open access from October 2007. Open access for consumers with demand less than 1 MW only after conditions are right for this category. The state electricity utility has been unbundled into GoMP' captive power policy seems to be restrictive as it is binding on the consumer to draw at least 50% of electricity from MPSEB and restricts total capacity of the captive plant to 1.5 times of contracted demand. The policy does not allow for the wheeling /sale of power to a third party. Any exemption from paying electricity duty shall be revoked if the consumer sets up his own captive power plant. Power purchases by MPSEB shall not be at rates higher than MPSEB's average cost of generation, which was Rs. 1.43 per unit in 2005-06. An energy development cess shall be levied at the rate of 20 paise per unit generated by the captive power plant.

Orissa

The SERC in the state of Orissa is the first in the country and over the period has brought in requisite regulations that can enable the creation of a competitive environment in the state. Orissa power sector comprises a transmission company, a trading company, two-generation companies and four distribution companies. The state was one of the first to unbundle its power sector followed by privatisation. In order to usher in competition and comply with the requirements of the Electricity Act 2003,

OERC has already notified the 'Open Access Policy' for the state whereby

consumers having a contracted demand above 5 MW and connected at 33 KV level are already able to choose their power supplier. However, direct open access purchases from a generating company has been delayed till April 2008.

Punjab

The state of Punjab continues to follow an integrated model whereby all the three functions of generation, transmission and distribution are handled by PSEB. In order to usher in competition and comply with the requirements of the Electricity Act 2003,

PERC has already notified the 'Open Access Policy' for the state whereby consumers having a contracted demand above 15 MW are able to choose their power supplier.

Rajasthan

Rajasthan was one of the first states in India to unbundle. RSEB was unbundled in July 2000 into a transmission company, Generation Company and three distribution companies. Further, as per the mandate of the EA 2003, the procurement and bulk supply of power and trading of power and PPAs were transferred to the three distribution companies on 28.2.2004.

The state regulator, RERC, has already notified an 'Open Access Policy' and consumers having a contracted demand above 5 MVA are already enjoying its benefits. Charges under open access policy have also been notified. At the current levels of cross-subsidy surcharge, wheeling and other charges applicable to the open access consumer in Rajasthan, it works out marginally more expensive than the grid tariff, even after assuming that HT consumers are able

too procure power from third sources at rates as low as Rs. 2.25/kwh. Such high level of open access charges is primarily driven by high cross-subsidy surcharge. This hinders the actual implementation of the 'Open Access Policy' in the state, which could have ushered in a competitive market scenario.

However, considering the level of current charges, it is favourable for high power consuming consumers to go for captive generation provided they are able to generate or procure power at reasonable levels (e.g. below Rs. 3-3.50/kwh).

On an overall basis, though the policy framework for creating a competitive environment in power sector in the state exists, downward revision in cross-subsidy surcharges is required to make it feasible for customers in the state to access power through open access policy.

Tamil Nadu

The state of Tamil Nadu continues to follow an integrated model whereby all the three functions of generation, transmission and distribution are handled by TNEB. In order to usher in competition and comply with the requirements of the Electricity Act 2003, TNERC has already notified the 'Open Access Policy' for the state whereby consumers having a contracted demand above 10 MW are able to choose their power supplier.

Tamil Nadu also has a captive power policy in place according to which captive generators of units having capacity 2000 KVA and above can opt for banking scheme or power feed scheme by paralleling their captive generation units with the grid.

Uttaranchal

Open access regulations were issued by UERC in April 2004 and allowed users

requiring 5 MW or above to opt for open access from December 31, 2005. Open access would be introduced in a phased manner with users requiring more than 1 MW eligible for open access from December 31, 2008. However, no time lines have been set for allowing open access to consumers requiring 1 MW or below. UERC has also not defined the charges that would be applicable for open access. GoU encourages generation of power through small hydropower sources of energy, and has framed policies for the development of this sector. There are different policies for hydropower projects/stations with an installed capacity of up to 25 MW, hydropower projects/stations with an installed capacity of 25 MW and up to 100 MW, and hydropower projects/stations with an installed capacity of 100 MW. All IPPs would be able to sell power to UPCL, to any HT consumer within Uttaranchal, to local rural grids within Uttaranchal that are not connected to UPCL's main grid, to any consumer outside the state.

Uttar Pradesh

While the State has separated the generation, transmission and distribution functions, the trading and transmission functions continue to remain vested in the same company viz. UPPCL. This may act as a deterrent against competition. However UP has started the process of competitive bidding for the procurement of power in the State. GoUP has designated UPRVUNL as its nodal agency for the purpose and UPRVUNL has initiated competitive bidding for the Anpara 'C' thermal power project.

UPERC has come out with regulations on allowing open access in transmission and distribution of power. As per the time table, open access for smaller customers with connected load above 1 MW will be completed in a phased

manner by April 1, 2008. The UPERC has also stated its intention to allow open access to consumers below 1 MW depending on the feasibility of doing the same. Open access for customers has already been granted to three companies viz. Balrampur Chini Mills, Nodia Power Company Limited and Kanoria Chemicals. Companies availing of open access shall pay wheeling charges, Cross Subsidy Surcharge (CSS) and an additional surcharge payable to the discom for meeting its fixed costs. As per UPERC, CSS is to be computed so as to meet the current level of cross -subsidy for that category of customer, however the exact amount will be notified only later by way of a separate tariff order. CSS would however not be payable by the captive consumers. UPERC has also come out with a policy on tariff determination for captive power generators and non-conventional power producers who intend to sell power to distribution licensees. As far as electricity duty is concerned, there is no ED on generation but only for distribution and works out to 6% of power sales. UPPCL officials have informed us that this is non-discriminatory. UPPCL has also started the process of implementing intra state ABT and UPPCL expects to complete the implementation within FY 2007.

West Bengal

One of the fundamental preconditions for creating a competitive market place , unbundling the sector on functional lines and separation of trading and transmission functions has not yet been completed. However, the financial restructuring and unbundling on functional lines is expected to get completed in the next six months as the consultant appointed by the Board viz. PWC has already submitted its report on the restructuring of the State power sector utilities. Also, as the unbundling is yet to be completed, competitive bidding for

the procurement of power is yet to materialize in the State.

WBERC has come out with regulations on allowing open access in transmission and distribution of power. As per the time table, open access for smaller customers with connected load upto 1 MW will be completed by 1.4.2011. Open access for high tension industrial customers has already been granted to three companies , however all the three companies happen to be Captive Power generators where the wheeling charges applicable is 56 paisa / kWh for using the WBSEB network. WBERC has not come out with open-access orders for any customer so far where Cross Subsidy Surcharge (CSS) is applicable, as per its guidelines however, CSS is to be computed using the avoided cost method. Overall, the principles and policies enunciated by WBERC so far do not seem to act as deterrent against competition, even though the scoring is constrained by the fact that actual figures for CSS and other applicable charges in case of Open-Access is not available.

WBERC has come out with a policy on captive power generation, as per which there is no discriminatory electricity duty (uniform duty of 40 paisa/unit) or excessive cross subsidisation surcharge impacting the viability of the captive generators. WBERC has urged the need for introducing intra State ABT through a notification, which is scheduled to be implemented in the State from June 2006.

Annexure 3

Table 1: Total no. of inter-state trading licences

Category of the Licence	Number of licences awarded till 31.3.2006
Category A	10
Category B	1
Category C	2
Category D	0
Category E	0
Category F	6
Total	19

Annexure 4

Table 2: Licensees undertaking trading in electricity

Name of the Licensee	Category of Licence
PTC India Ltd	F
NTPC Vidyut Vyapar Nigam Ltd	F
Adani Exports Ltd	F
Tata Power Trading Company (P) Ltd	F
Reliance Energy Trading Ltd	F
Subash Kabini Power Corporation Ltd	A
Lanco Electric Utility Ltd	F

Annexure 5

Table 3: Major Reason for Slippage for Capacity Addition in X plan

Sr. No.	Major Reasons for Slippage	Capacity Slipped	
		Thermal	Hydro
1	Delay in super critical technology tie up by BHEL	3960	-
2	Geological Surprises		510
3	Natural Calamities		450
4	Delay in Awarded works	998	283
5	Delay in MoE&F clearance		400
6	Investment decision/ Funds tie up constraints/	1500	1400

	delay in financial closure		
7	ESCROW cover (Private Sector)	500	
8	R&R Issues		400
9	Court Cases		675
10	Law & order problem	7548	5058

Annexure 6

Table 4: Target vs Achievement during VIIth and IXth plans

Sector	Target (MW)	Achievement (MW)
State	25528	16223
Central	24767	12891
Private	20399	6323.4

Annexure 7

Table 5: 10th plan Capacity Addition Target-Sector wise

Sector	Hydro (MW)	Thermal (MW)	Nuclear (MW)	Total (MW) (%)
State	8742	12790	1300	22832 (55.5%)
Central	4481	6676	0	11157 (27.2%)
Private	1170	5951	0	7121 (17.3%)
Total	14393	25417	1300	41110 (100%)

Annexure 8

Table 6: Open Access Regulations Notified by SERC's

<u>S. No.</u>	<u>SERC</u>	<u>OA</u> <u>Notification</u>	<u>Surcharge Method</u>
1.	APERC	2005	Embedded Cost method
2.	AERC	01-08-05	Cost of Supply method
3.	CSERC	30-07-05	Average cost method
4.	DERC	03-01-06	N/A
5.	GERC	29-09-05	Annually approved on submission of ARR
6.	HERC	19-05-05	Embedded Cost
7.	HPERC	21-08-06	Avoided Cost/Embedded Cost (acc to Tariff Policy)
8.	JSERC	28-06-05	Embedded Cost (acc to Tariff policy)
9.	J&KSERC	25-01-06	Methodology adopted but not specified
10.	KERC	12-11-04	Embedded cost (acc to tariff policy)
11.	KSERC	02-11-05	As specified in Tariff Policy
12.	MPERC	24-06-05	Avoided Cost/ Embedded Cost (In acc to Tariff Policy methodology)
13.	MERC	21-06-05	According to Tariff policy
14.	OERC	06-06-06	Avoided Cost
15.	PERC	09-08-05	surcharge shall be equal to one-half(50%) of the current level of cross subsidy, where cross subsidy equal to realization per unit minus average cost of supply
16.	RERC	26-05-04	Embedded Cost
17.	TNERC	03-08-05	As per Tariff Policy
18.	TERC	Not yet done. Draft proposal under consultation	-----
19.	UERC	08-06-04	Case to Case basis
20.	UPERC	18-06-05	As per Tariff Policy
21.	WBERC	30-06-05	Avoided Cost

Annexure 9

Table 7: Transmission, Wheeling and surcharges for Open Access as determined by the SERC's

SERC	Transmission & Wheeling Charges					Surcharge
APERC	Wheeling Charges for 2006-07	APEPDCL (Rs. kVA/ month)	APNPDCL (Rs. kVA/ month)	APCPDCL (Rs. kVA/ month)	APSPDCL (Rs. kVA/ month)	For HT category I – Industry General:- 188paise/unit at 33kV at APCPDCL
	33kV	11.28	23.49	32.7	25.03	
	11kV	56.41	85.94	91.02	109.43	
	LT	224	185.52	126.44	152.06	
AERC	132kV – 54p/unit					HT bulk supply - Rs.0.47/kWh
	33kV & below - 112p/unit for LAEDCL, 152p/unit for CAEDCL, 107p/unit for UAEDCL (plus loss in kind)					HT Industries I - Rs.0.42/kWh
CSERC	Transmission Charges (acc., to TO dt. 13-09-06)					HT Industries II - Rs.0.42/kWh
	LTOA – Rs.65639/MW/month					Tea & Coffee - Rs.1.50/kWh
	STOA – Rs.540/MW/day					Oil & Coal Rs.0.81/kWh Irrigation HT Rs.0.12/kWh
	Wheeling Charges:					For the year 2006-07
	At 33kV – 17.37 paise/unit					EHT: 132kV & above - 68p/unit
DERC	OA Notified on 03-01-06, charges yet to be determined					HT: 33kV - 55p/unit
GERC	Charges for 2006-07					-----
	Transmission charges					Rs.1.80/unit was notified through order dt. 28.02.06
	LTOA Rs.2832/MW/day					Reduced to Rs.1.35/unit through TO dt. 06-05-06
	STOA Rs.708/MW/day					
	Wheeling Charges for 2006-07, Rs.2459/MW/day plus losses in kind for point of injection from 11kV, 22kV, & 33kV to energy delivered at 11kV & at 400V					
HERC	STOA Transmission charges – (Rs./MW/day)					-----
	6 Hours per day	6 to 12 Hours per day	Above 12 Hours			
	296.38	592.77	1185.54			
HPERC	Procedure of calculation for determination of wheeling charges notified.					-----
JSERC	Completed					Rs.0.31/unit for EHT,HT consumers
J&KSERC	Notified in OA regulation but not determined					-----
KERC	Transmission charges					66kV & above - 113p/unit
	LTOA Rs.10.5 lakhs/MW/day					33kV - 80p/unit
	STOA Rs.720/MW/day					(w.e.f- 20-04-06)
	Wheeling Charges:					
	@ 33/11kV & 5.5% network loss in kind, 10.58 paise/unit					
KSERC	N/A					-----

MPERC	Transmission charges: 132kV & above – LTOA - Rs.2728.73/MW/day STOA – Rs.682.18/MW/day Wheeling Charges - specified in OA regulation for 33kV & below	132kV & above - 126 p/unit 33kV & below - 102.7p/unit
MERC	Wheeling Charges TPC Network: HT consumers – Rs.150/kW/month REL Network: HT consumers – Rs.35/kW/month	Current level of cross-subsidy surcharge for MSEDCL, REL, TPC area is zero.
	MSEDCL 33kV Rs.3/kVA/month 22 & 11 kV Rs.37/kVA/month 415 V Rs.113/kVA/month	
OERC	OA transmission charges fixed at 22p/unit for EHT for the year 2006-07	Yet to be computed
PERC	Charges acc to TO 2006-07 Wheeling charge LTOA Rs.3389/MW/day STOA Rs.2568/MW/day	For Large Industries 31.94 paise/unit
RERC	OA Transmission charges for the year 2006-07 @ Rs.83.96 kW/month	91 paise/unit for large industrial consumers. The surcharge is uniform throughout the state
TNERC	Wheeling charges 14.74p/unit	At 22/11kV surcharge for HT industrial consumer is 97.17 paise/unit
TERC	Not yet notified	
UERC	Already provided in the transmission tariff regulations, which states that beneficiaries would share the annual transmission charges on the basis of allocation.	----- To be done on case-to-case basis
UPERC	To be determined	To be done on case-to-case basis
WBERC	Determined in OA regulations for 2005-06	Not yet computed

Annexure 10

Table 8: Status of Open Access cases in the country

SERC	Approved	Captive or Consumer	Implemented	Remarks
CSERC	04	CPP – 03 Consumer -01	4 (CPP – 3 Consumer – 01)	In addition to these 4, 16 old cases have been rewarded
GERC	01	CPP - 01	0	In addition, 8 old cases
JSERC	01	Consumer - 01	-----	-----
KERC	01	Consumer - 01	-----	-----
KSERC	01	Consumer - 01	-----	-----
MERC	00	CPP – 02 Consumer -02	00	All 04 Applications under process
MPERC	11	CPP – 10 Consumer -01	01 (CPP-01)	1 CPP under progress
PERC	04	CPP – 01 Consumer -03	01 (CPP-01)	-----
RERC	03	CPP - 03	03 (CPP-03)	-----
WBERC	03	CPP-03	Nil	-----
TOTAL	29	CPP – 23, Consumer – 10	CPP – 08 Consumer – 01	-----

Annexure 11

Table 9 - Return on Equity

S. No.	SERC	RoE %	Summary
1.	APERC	14	The Commission as adopted ROCE instead of ROE in TO 2006-07
2.	AERC	3%	The Commission approved a ROE of 3% in the TO 2006-07
3.	CSERC	14	Notified in T&C of Tariff on 01-03-06
4.	GERC	14	ROE notified @ 14% but, in recent Tariff Order dated 06-05-06, the commission has allowed only 7%
5.	JSERC	14	The commission has decided on ROE @ 14% but, the distribution licensees have suggested an ROE @ 16%
6.	J&KSERC	14	The commission has decided to give ROE @ 14%
7.	KERC	14	The commission has decided on ROE @ 14%.
8.	MPERC	14	Revised Regulation incorporating ROE@14% will be Notified on 10th Nov'06.
9.	OERC	16	ROE @ 16%. ROE linked to RBI bank rate plus a margin for investment risk in power sector.
10.	TNERC	14	RoE notified in the T&C of tariff. The commission is considering to adopt ROCE
11.	UERC	14	RoE notified on 15-06-05, with a D/E = 70:30. In certain cases where equity is less than 30% the said actual equity is considered for tariff determination.
12.	WBERC	14	Provision has been made in the ROE @ 14% is accepted. Regulation for additional for 1% RoE for distribution licensee if commission so feels.

Annexure - 12

Table 10: Phasing Details for granting Open Access by SERC's

<u>S.No.</u>	<u>SERC</u>	<u>Phasing Details</u>		
1.	APERC	Phase	Eligibility criteria	Commencement date
		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
2.	AERC	Phase	Eligibility criteria	Commencement date
		1.	Consumers with a Connected Load of 10 MW and above	1 April 2006
		2.	Consumers with a Connected Load of 7.5MW MVA and above	1 April 2007
		3.	Consumers with a Connected Load of 3 MW and above	1 April 2008
3.	CSERC	Phase	Eligibility criteria	Commencement date
		1.	Users requiring 10 MW or above	1 April 2006

4. DERC

2.	Users requiring 5MW and above	1 April 2007
3.	Users requiring 2 MW and above	1 October 2007
4.	Users requiring 1MW and above	1 April 2008
Phase	Eligibility criteria	Commencement date
1.	Users with connected load 5MW and above	1 July 2007
2.	Users with connected load 3MW and above	1 January 2008
3.	Users with connected load 1MW and above	1 July 2008
4.	Users with connected load less than 1MW, subject to review and operational constraints and other factors	1 July 2008

5. GERC

Phase	Load Level	Time Frame
1	Load of 5MW and above	After Intra-State ABT is put in place or 1 st January, 2006 whichever is later.
2	Load of 1MW and above	2 years after introduction of 1 above

6. HERC

SI. No.	Phase	Category of consumers	Date from which open access will be allowed
1	I	15 MVA and above	October 1, 2006
2	II	3 MVA and above	October 1, 2007

7. HPERC

2	II	3 MVA and above	October 1, 2007
3	III	1 MVA and above	April 1, 2008
Phases	Contract demand		Date from which open access shall be allowed
Phase I	5 MVA and above		10 th June 2005
Phase II	Above 2 MVA but not exceeding 5 MVA		1 st April 2006
Phase III	Above 1 MVA but not exceeding 2 MVA		1 st April 2007

Based on the experience of open access in Phase I, the Commission may revise the phasing, for allowing open access in subsequent phases.

8. JSERC

Phase	Consumer Load Level	Date of Grant
1	25MW & above	November 1, 2005
2	10MW & above	April 1, 2006
3	1MW & above	April 1, 2008

9. J&KSERC

Phase	Load Level	Time Frame
1	Load of 5MW and above	After Intra-State ABT is put in place or 1 st January, 2007 whichever is later.
2	Load of 1MW and above up to 5MW	2 years after introduction of 1 above

Based on the experience of operation of open access in phase-I, the Commission may revise the schedule for allowing open access in subsequent phases. The Commission may allow open access to consumers with less than 1 MW contract demand at such time as it may consider feasible having regard to operational constraints and other factors.

10. KERC

Phase	Eligibility criteria	Commencement date
1.	All HT installations with Contract Demand of 15 MW and above and with voltage level of 66 kV and above	From 10 th June 2005
2.	All HT Installations with Contract Demand of 5MW & above and with voltage level 33 kV and above	From 1 st April 2006
3.	All HT Installations with Contract Demand of 3 MW & above and with voltage level 11 kV and above	From 1 st April 2007
4.	All HT Installations with Contract Demand of 1 MW & above	From 1 st April 2008

11. KSERC

Phase	Consumers with maximum demand of	Time
I	10 MW and above	from 1.12.2005 onwards
II	5 MW and above	from 1.12.2006 onwards
III	3 MW and above	from 1.12.2007 onwards
IV	1 MW and above	from 1.12.2008 onwards

12. MPERC

Phase	Customers	Area	Date of Grant
I	10MW or above at 132kV	Anywhere in state	Regulations coming to effect
II	5MW or above at 33kV	Industrial growth areas notified by state govt. or having independent 33kV feeders from EHV SS	Regulations coming to effect
III	2MW or above at 33kV	Industrial growth areas notified by state govt.	1/10/2005
IV	5MW or above	Anywhere in state	1/4/2006
V	1MW or above	Industrial growth areas notified by state govt.	1/10/2006
VI	2MW or above	Anywhere in state	1/4/2007
VII	1MW or above	Anywhere in state	1/10/2007

13. MERC

Phase	Contracted Demand of the Consumer	Date on which open access will be allowed under sub-section (2) of Section 42 of the Act
I	Not less than 5 MVA	Publication of these Regulations in Official Gazette.
II	Not less than 2 MVA but less than 5 MVA	April 1, 2006
III	Not less than 1 MVA	April 1, 2007

14. OERC

Phase	Eligibility criteria	Commencement date
1	Requiring power exceeding 5 MW	April 1, 2008
2	Requiring power exceeding 2 MW	October 1, 2008
3.	Requiring power exceeding 1 MW	January 1, 2009

15. PERC

Phases	Category of consumers	Open Access to be allowed before or on
Phase I	Consumers with demand of 15 MW and above	January 1, 2006
Phase II	Consumers with demand of 3 MW and above	April 1, 2006
Phase III	Consumers with demand of 1 MW and above	April 1, 2008

16. RERC

S. No.	Phase	Category of consumers	Time from which open access allowed
1	I	Consumers with the contract demand of 15 MVA and above	April 1, 2005
2	II	Consumers with the contract demand of 5 MVA and above	April 1, 2006

3	III	Consumers with the contract demand of 1.5 MVA and above	April 1, 2007
4	IV	Consumers with the contract demand of 1.0 MVA and above	April 1, 2008

17. TNERC

Phases	Consumer with Capacity	Date by which open access shall be allowed
Phase 1	10 MW and above	Before 6 months from the date of commencement of these regulations
Phase 2	5 MW and above	After 6 months but before 18 months from the date of commencement of these regulations
Phase 3	Above 1 MW	After 18 months but before 30 th December 2008

18. TERC

Not yet done. Draft proposal under consultation

19. UERC

Phases	Capacity sought to be allocated by the Open Access Consumer	Date by which open access shall be allowed
Phase 1	5 MW and above	December 31, 2005
Phase 2	3 MW and above	December 31, 2007
Phase 3	Above 1 MW	December 31, 2008

20. UPERC

Phase	Category of Consumers	Time from which Open Access is Allowed
1.	Consumers with demand of 20 MW and above and connected on voltage levels of 33 KV and above	July 1, 2005
2.	Consumers with demand of 10 MW and above and connected on voltage levels of 33 KV and above	April 1, 2006
3.	Consumers with demand of 5 MW and above and connected on voltage levels of 11 KV and	April 1, 2007
4.	Consumers with demand of above 1 MW	April 1, 2008

4.	Consumers with demand of above 1 MW	April 1, 2008
----	-------------------------------------	---------------

21.	WBERC	Phases	Category of Consumer	Time frame from which Open Access is / has allowed
		I	Power from Co- generation & Non-Conventional Source of Energy	1.04.2006
		II	Consumers with connected load of 10 MW and exceeding 10 MW in single premises	1.04.2007
		III	Consumers with connected load of 5 MW and exceeding 5 MW in single premises	1.04.2008
		IV	Consumers with connected load exceeding 1 MW in single premises	1.01.2009

Annexure 13

Table 11: Depreciation Rates

<u>S. No.</u>	<u>SERC</u>	<u>CERC Rates</u>	<u>Suggestions for separate Depreciation Rates</u>
1.	AERC	Adopted	Adopted CERC depreciation rates. Suggest evolving of separate rates for Distribution by FOR. Adheres to AAD arrangement notified by CERC.
2.	CSERC	Adopted	CERC rates adopted. Suggests separate rates that takes care of loan repayment period rather than the asset of the life. CSERC requires AAD
3.	GERC	Adopted	CERC depreciation rates are adopted. The commission has nothing to comment on the evolving of separate rates for distribution by FOR.
4.	JSERC	Adopted	CERC depreciation rates adopted. No say of evolving new depreciation rates.
5.	J&KSERC	Adopted	CERC depreciation rates have been adopted but no suggestion regarding evolving of separate depreciation rates for distribution.
6.	KERC	Adopted	Depreciation rates specified by CERC have been adopted, KERC favors separate rates for distribution to be evolved but, no suggestion is given.
7.	MPERC	Adopted	The commission has followed the CERC specified depreciation rates. Suggests separate rates for the distribution rates based on the economic life of the assets. Until these rates are evolved, MPERC as recommended to adopt MoP rates notified in 1994.
8.	OERC	Not Adopted	OERC has adopted a weighted average of 3.67% in RSTO 24-06-03. OERC has been directed by High Court to depreciation rates calculated for assets in accordance with the state Governments, DoE notification no. 1068/E dt. 29-01-03 & at pre-1992 norms as notified by GoI.
9.	TNERC	Adopted	CERC rates to be adopted, but suggests separate rates for distribution assets based on different useful life period to be fixed for meter of different type in distribution network.
10.	UERC	Adopted	CERC specified rates are adopted by the UERC & no suggestions on evolving of new depreciation rates for Distribution by FOR.
11.	WBERC	Adopted	CERC rates adopted. Advocates separate rates to be evolved but, reasons not specified.

Annexure 14

Table 12: Implementation of Intra-state ABT

<u>S. No.</u>	<u>SERC</u>	<u>Intra-state ABT</u>	<u>Summary</u>
1.	AERC	Not Notified	To be Notified, SLDC operates as per requirements of Inter State ABT. LDC yet to be established. Frequency based meters to be installed & special energy meters (to be completed by year end).
2.	CSERC	Not Notified	Orders not issued reason being Board not restructured & no urgency but, draft regulations prepared and views being obtained.
3.	GERC	Order Issued on 11-08-06	Commission had a trial Mock run exercise. Tech up-gradation is almost complete through consultancy assignment to POWERGRID
4.	JSERC	Not Notified	A draft as been circulated calling for comments.
5.	J&KSERC	Not Notified	Technology upgrades matching facilities to that of RLDC is available but no reasons is specified on the constraints in implementing Intra-state ABT.
6	KERC	Order issued on 26-06-06	Discussion paper published. Action plan also prepared. SLDC to be upgraded by KPTCL. Draft specification approved by Expert Committee. Project cost estimated Rs. 191 crores.
7.	KSERC	Not Notified	Draft published
8.	MPERC	Not Notified	Draft balancing & settlement code has been issued and is likely to be finalized in Nov '06. Lack of infrastructure for implementing. SLDC not completely upgraded, it only monitors power flow from generation to discom on real time basis & displays on-line information on the activities. Installation of LDC for Discom under ULDC project.
9.	MERC	Not Notified	Discussion paper published on 10 th Nov 2006. Targeted date of issue of order is Dec 2006
10.	OERC	Not Notified	Prepared the draft regulation. With respect to tech., upgrades OPTCL has already set up ULDC project of SLDC, but requires further up-gradation.
11.	TNERC	Not Notified	Draft concept paper has prepared and circulated to stake holders. Lack of Infrastructure. TNEB not yet unbundled.
12.	TERC	Not Notified	No details on status of Intra-state ABT
13.	UERC	Order Issued; on 04-01-05	Order was issued on 04-01-05 for completing the requirement for intra-state ABT by 01-11-05. Progress of implementation not known.
14.	WBERC	Not Notified	A set of regulations issued.

Annexure 15

Table 13 - TOD Tariff

<u>S. No.</u>	<u>SERC</u>	<u>TOD Introduced</u>	<u>Summary</u>
1.	AERC	Yes	Introduced TOD tariff for Industries (HT), Tea, Coffee & Rubber, Oil & Coal. TOD meters also installed for HT up to load above 150kVA
2.	CSERC	Yes	Optional, applicable to all HT industries but not for CPP. Also n/a for Hospitals, Water works, Traction, General purpose & temporary HT connections.
3.	GERC	Yes	For HT consumers having contacted load 500kVA & above. Exclusive Night use tariff for HT (contacted load 100kVA a7 above). Night Time consumption rebate for LT water works.
4.	JSERC	Yes	TOD introduced in TO '03-'04 for HT consumers
5.	J&KSERC	No	Introduction of TOD tariff to be considered in the 1st issue of Tariff Order by the Commission.
6.	KERC	Yes	TOD introduced for HT Industries, HT Water Supply, LT Industries in Sept. '05 Tariff Order.
7.	MPERC	Yes	TOD tariff introduced for HT consumers with 10MW & above Load except Railways, Coal-mines, Irrigation, PWW, BST exemptees. Tariff for Non-Domestic consumers having load 10kW & above.
8.	OERC	Yes	Off-peak tariff @ 10p/unit for 3 phase consumers with static meters, acc to RST order dt. 22-03-05. and discount for the same consumers (i) covered under special agreement. (ii) Under any concessional tariff and (iii) Public lighting.
9.	TNERC	Yes	TOD tariff introduced & meters have been installed with incentives and disincentives for peak & off-peak hour for all HT industrial consumers.
10.	UERC	Yes	TOD introduced for all HT consumers and LT small, medium, & non-domestic consumers having load more than 25kW.
11.	WBERC	Yes	Applicable to those who are under two part tariff i.e., Industrial, Public Utilities, Commercial & Agricultural.

Annexure 16

Table 14: Renewable Source of Energy

<u>S. No.</u>	<u>SERC</u>	<u>Tariff</u>		<u>Power Procured From Renewables (%)</u>
1.	APERC	NCE Source	Variable charges (Rs./kWh)	For FY '05-06 = 4.28%
		Biomass	2.87	
		Bagasse	2.71	
		Municipal Waste to Energy	3.59	
		Industrial Waste to Energy	2.96	
		Wind Power	3.31	
		Mini Hydel	2.20	
		NCL Energy Ltd.	1.78	
Rates acc. to Tariff Order 2006-07				
2.	AERC	No		Not notified, as no NCE source is available
3.	CSERC	(1) Biomass plants - Rs.2.67 to 2.98 per unit (provisions for review after 3 yrs).		5% from biomass based generation. Small hydro generators are under consideration.
4.	DERC	No		Not notified, as no NCE source is available.
5.	GERC	Wind - Rs.3.37/unit (fixed for 20 yrs)		For FY '06-07 = 1% & FY '07-08 = 2%
6.	JSERC	Not determined		Not yet fixed
7.	KERC	(1) Mini hydel – Rs.2.80/unit, without escalations (2) Wind – Rs.3.40/unit, without escalations (3) Biomass – Rs.2.85/unit, with 2% simple annual escalations. (4) Co-gen – Rs.2.80/unit, with 2% simple annual escalations.		Minimum 5% & maximum 10% of energy consumption in the area of distribution licensee.
8.	MPERC	1) Existing Wind generators: existing agreement @ Rs.2.25/unit & after expiry of the agreement Rs.2.87/unit. 2) New Wind generators: 1 st yr – Rs.3.97/unit		0.5%

		2 nd yr – Rs.3.80/unit 3 rd yr – Rs.3.63/unit 4 th yr – Rs.3.46/unit 5 th yr & onwards up to the 20 th yr – Rs.3.30/unit.																
9.	OERC	Not determined	3% of total power purchase during FY 07-08 to go up @ 0.5% per annum for each subsequent year to reach a level of 5% by FY 2011-12															
10.	RERC	(1) Wind: Rs.3.31/unit in 1 st year with increase @ 5 paisa per year up to 10th year & constant thereafter. (2) Bio-mass: levelised tariff of Rs.3.66/unit.	(1) Non-firm wind energy : FY '06-'07, 2.00% , FY '07-'08, 3.00% , thereafter, 0.30% addition every year till 4.0% is achieved (2) Firm bio-mass energy FY '06-'07, 0.37% FY '07-'08, 0.83% thereafter 0.30% addition every year till 2.0% is achieved.															
11.	TNERC	(1) Wind mills (commissioned and agreement executed prior to 15-05-06) - Rs.2.75/unit (2) Wind mills (commissioned and agreement executed after 15-05-06) – Rs.2.40/unit (3) Biomass – Rs.3.15/ unit (4) Bagasse – Rs.3.15/unit	10% from non conventional sources															
12.	UERC	Up to 1MW – SHP normative tariff on pooled rate of CGS supply. 1MW-25MW – hydro, determined on cost plus based on regulations	100% purchased ahead of merit order from small hydro less than 25MW															
13.	WBERC	(1) Biomass - Rs. 3.35/unit (2) Wind - Rs.4/unit (3) Small Hydel - =Rs. 3.6/ unit (valid for 3 yrs w.e.f May 2006)	<table border="1"> <thead> <tr> <th></th> <th>2006-07</th> <th>2007-08</th> </tr> </thead> <tbody> <tr> <td>WBSEB</td> <td>1.9%</td> <td>3.8%</td> </tr> <tr> <td>CESC Ltd.</td> <td>1.02%</td> <td>2.03%</td> </tr> <tr> <td>DPL</td> <td>0.72%</td> <td>1.4%</td> </tr> <tr> <td>DPSC Ltd.</td> <td>0.43%</td> <td>0.95%</td> </tr> </tbody> </table>		2006-07	2007-08	WBSEB	1.9%	3.8%	CESC Ltd.	1.02%	2.03%	DPL	0.72%	1.4%	DPSC Ltd.	0.43%	0.95%
	2006-07	2007-08																
WBSEB	1.9%	3.8%																
CESC Ltd.	1.02%	2.03%																
DPL	0.72%	1.4%																
DPSC Ltd.	0.43%	0.95%																

Annexure 17

Table 15: Status of Determination of Open Access Surcharge

S. No.	SERC	Surcharge
1.	APERC	For HT category I – Industry General:- 188paise/unit at 33kV at APCPDCL
2.	AERC	HT bulk supply - Rs.0.47/kWh HT Industries I - Rs.0.42/kWh HT Industries II - Rs.0.42/kWh Tea & Coffee - Rs.1.50/kWh Oil & Coal Rs.0.81/kWh Irrigation HT Rs.0.12/kWh
3.	CSERC	For the year 2006-07 EHT: 132kV & above - 68p/unit HT: 33kV - 55p/unit
4.	GERC	Rs.1.80/unit was notified through order dt. 28.02.06 Reduced to Rs.1.35/unit through TO dt. 06-05-06
5.	JSERC	Rs.0.31/unit for EHT, HT consumers
6.	KERC	66kV & above - 113p/unit 33kV - 80p/unit (w.e.f - 20-04-06)
7.	MPERC	132kV & above - 126 p/unit 33kV & below - 102.7p/unit
8.	MERC	Current level of cross-subsidy surcharge for MSEDCL, REL, TPC area is zero.
9.	OERC	Yet to be computed
10.	PERC	For Large Industries 31.94 paise/unit
11.	RERC	91paise/unit for large industrial consumers. The surcharge is uniform throughout the state
12.	TNERC	At 22/11kV surcharge for HT industrial consumer is 97.17 paise/unit
13.	URC	To be done on case-to-case basis
14.	UPERC	To be done on case-to-case basis
15.	WBERC	Not yet computed

Annexure 18

Table 16: Harnessing of Surplus Captive Generation

1. AERC

S. No.	Recommendations of 'FOR'	Status
1	There should be no penalty for reduction of contracted demand by consumer having CPP.	Formal reduction may be allowed
2	In view of little justification for levy of parallel operations charges/ Grid Support Charges these charges to be kept at the lowest level.	No such charges have been included in transmission & wheeling charge.
3	There should be no minimum guarantee charges.	Noted
4	Charges for start-up / stand-by power should be reasonable and should not exceed the charges fixed for temporary connection.	Back up rate may be made compatible with alternate fuel rate.
5	Wheeling charges and other terms & conditions should be determined in advance by the SERC ensuring that charges are reasonable and fair.	Notified along with TO 2006-07

2. GERC

S. No.	Recommendations of 'FOR'	Status
1	There should be no penalty for reduction of contracted demand by consumer having CPP.	No provision for penalty
2	In view of little justification for levy of parallel operations charges/ Grid Support Charges these charges to be kept at the lowest level.	No parallel operation charges
3	There should be no minimum guarantee charges.	No minimum guarantee charges
4	Charges for start-up / stand-by power should be reasonable and should not exceed the charges fixed for temporary connection.	Stand-by energy to be charged at UI rate applicable from time to time.
5	Wheeling charges and other terms & conditions should be determined in advance by the SERC ensuring that charges are reasonable and fair.	Wheeling charges determined through ARR exercise & is in line with CERC regulations

3. J&KSERC

Regulations under preparation, all 'FOR' recommendations (points 1 – 5) is taken care in the regulation

4. JSERC

<u>S. No.</u>	<u>Recommendations of 'FOR'</u>	<u>Status</u>
1	There should be no penalty for reduction of contracted demand by consumer having CPP.	Regulation for CPP is in process of finalization, this feature has been included in the draft regulation.
2	In view of little justification for levy of parallel operations charges/ Grid Support Charges these charges to be kept at the lowest level.	Regulation for CPP is in process of finalization, this feature has been included in the draft regulation.
3	There should be no minimum guarantee charges.	Regulation for CPP is in process of finalization, this feature has been included in the draft regulation.
4	Charges for start-up / stand-by power should be reasonable and should not exceed the charges fixed for temporary connection.	Is incorporated in Tariff Order
5	Wheeling charges and other terms & conditions should be determined in advance by the SERC ensuring that charges are reasonable and fair.	Tariff determination of JSEB is in progress. Regulations for determination of wheeling charges in place

5. MPERC

<u>S. No.</u>	<u>Recommendations of 'FOR'</u>	<u>Status</u>
1	There should be no penalty for reduction of contracted demand by consumer having CPP.	No penalty however, the initial agreement of two years is binding on the consumers.
2	In view of little justification for levy of parallel operations charges/ Grid Support Charges these charges to be kept at the lowest level.	Grid Support Charges have been stipulated
3	There should be no minimum guarantee charges.	Obligation to pay minimum guarantee charges on the regular contracted demand.
4	Charges for start-up / stand-by power should be reasonable and should not exceed the charges fixed for temporary connection.	Standby charges – Rs.20/kVa/month. In addition, normal demand charges are payable for licensee when it is availed. This support is restricted up to 1000 hours/annum, beyond this

		supply is given at temporary connection rate. For CPP's not connected to the grid, standby support on normal charges is 750 hours/annum & beyond up to 1000 hours there are additional charges @ 10% higher than normal charges. Beyond 1000 hours temporary connection rates is applicable.
5	Wheeling charges and other terms & conditions should be determined in advance by the SERC ensuring that charges are reasonable and fair.	Presently wheeling charges is prescribed as a part of OA regulations. Actual charges to be determined in the forthcoming tariff.

6. OERC

S. No.	Recommendations of 'FOR'	Status
1	There should be no penalty for reduction of contracted demand by consumer having CPP.	No demand charges are prescribed. According to TO 2006-07, Industrial consumers owing CPP, 420p/unit at EHT, 440p/unit at HT. Others who draw only 25% of capacity of highest unit would pay @ 380p/unit and 400p/unit at EHT & HT respectively.
2	In view of little justification for levy of parallel operations charges/ Grid Support Charges these charges to be kept at the lowest level.	No provision
3	There should be no minimum guarantee charges.	There is no MGR
4	Charges for start-up / stand-by power should be reasonable and should not exceed the charges fixed for temporary connection.	No provision
5	Wheeling charges and other terms & conditions should be determined in advance by the SERC ensuring that charges are reasonable and fair.	Yet to be specified by the commission

7. TNERC

S. No.	Recommendations of 'FOR'	Status
1	There should be no penalty for reduction of contracted demand by consumer having CPP.	No penalty is imposed for reduction once in a year.
2	In view of little justification for levy of parallel operations charges/ Grid Support	Grid Support Charges have been specified with reference to the

	Charges these charges to be kept at the lowest level.	drawl from the licensee
3	There should be no minimum guarantee charges.	There is no MGR
4	Charges for start-up / stand-by power should be reasonable and should not exceed the charges fixed for temporary connection.	Theses charges have been specified in accordance with the provision in the Tariff Policy.
5	Wheeling charges and other terms & conditions should be determined in advance by the SERC ensuring that charges are reasonable and fair.	Specified in the Commission order dt. 15-05-06

8. TERC

<u>S. No.</u>	<u>Recommendations of 'FOR'</u>	<u>Status</u>
1	There should be no penalty for reduction of contracted demand by consumer having CPP.	Not applicable
2	In view of little justification for levy of parallel operations charges/ Grid Support Charges these charges to be kept at the lowest level.	Not yet done
3	There should be no minimum guarantee charges.	Not yet concerned
4	Charges for start-up / stand-by power should be reasonable and should not exceed the charges fixed for temporary connection.	Not yet formulated
5	Wheeling charges and other terms & conditions should be determined in advance by the SERC ensuring that charges are reasonable and fair.	Not yet done

9. UERC

<u>S. No.</u>	<u>Recommendations of 'FOR'</u>	<u>Status</u>
1	There should be no penalty for reduction of contracted demand by consumer having CPP.	The commission has facilitated the consumers having PP for taking power from the licensees on temporary basis. Hence, no penalty for reduction of load is envisaged.
2	In view of little justification for levy of parallel operations charges/ Grid Support Charges these charges to be kept at the lowest level.	No charges determined.
3	There should be no minimum	There is no MGR

	guarantee charges.	
4	Charges for start-up / stand-by power should be reasonable and should not exceed the charges fixed for temporary connection.	Similar charges are levied for drawl of power as applied to other consumers.
5	Wheeling charges and other terms & conditions should be determined in advance by the SERC ensuring that charges are reasonable and fair.	No case reported

10. WBERC

S. No.	Recommendations of 'FOR'	Status
1	There should be no penalty for reduction of contracted demand by consumer having CPP.	No penalty is imposed.
2	In view of little justification for levy of parallel operations charges/ Grid Support Charges these charges to be kept at the lowest level.	Charges kept at low level.
3	There should be no minimum guarantee charges.	There is no MGR
4	Charges for start-up / stand-by power should be reasonable and should not exceed the charges fixed for temporary connection.	Regulation is under preparation.
5	Wheeling charges and other terms & conditions should be determined in advance by the SERC ensuring that charges are reasonable and fair.	Draft regulation circulated inviting comments.

Annexure 19

Table 17: GRID Code

<u>S. No.</u>	<u>SERC</u>	<u>Date of Notification</u>	<u>Status</u>
1.	AERC	Feb 10, 2005	Notified
2.	CSERC	Dec 23, 2006	Notified
3.	GERC	Aug 25, 2004	Notified
4.	JSERC	N/A	State Grid Code issued for comments
5.	J&KSERC	N/A	Draft Notified
6.	KERC	Jan 26, 2006	Notified
7.	KSERC	Jan 13, 2006	Notified
8.	MPERC	Aug 6, 2004	Notified
9.	MERC	2006	Notified
10.	OERC	June 14, 2006	Notified
11.	PSERC	Mar 9, 2006	Notified
12.	RERC	N/A	Approved by RERC on 22-03-03, being revised in line with IEGC '05
13.	TNERC	Dec 14, 2005	Notified
14.	TERC	N/A	Draft under preparation
15.	UERC	N/A	Draft Code notified & to be finalized
16.	UPERC	Aug 8, 2000	Notified
17.	WBERC	Jan 16, 2006	Notified

Annexure 20

Table 18: Technology Up-gradation

S. No.	SERC	Status
1.	AERC	SLDC equipped with technology equivalent to RLDC. LDC not yet established
2.	CSERC	Up-gradation started & is expected to be completed by year end
3.	DERC	Up gradation of SLDC has been undertaken by Power Grid, with cost of recovery through ULDC charges.
4.	GERC	Upgrades almost complete with aid of 'Powergrid' as consultant
5.	HERC	To establish SLDC
6.	JSERC	No Action taken despite reminders
7.	J&KSERC	Facilities available.
8.	KERC	KPTCL responsible for upgrades, they have informed KERC that draft specification is approved by expert committee. Cost of project estimated at Rs.191 crores
9.	MPERC	SLDC only provides online display of activities, power flow from generation to discoms. Installation of LDC for discoms under ULDC project
10.	MERC	To be done by SLDC/STU for which necessary budget approval for SLDC is granted vide order 16 th May 2006 in case No 30 of 2005
11.	OERC	ULDC though set up by <u>OPTCL</u> requires further up-gradation
12.	RERC	Technological up gradation of SLDC and SCADA has been completed. Display of Discom-wise data at Discom HQ is yet to be completed.
13.	TNERC	Lack of infrastructure. Suo-motu issued
14.	TERC	Project under implementation
15.	UERC	Matter taken care by SLDC
16.	WBERC	SLDC matches the facilities that of RLDC

Annexure 21

Table 19: Open Access Transmission Charges & Distribution networks charges

S. No.	SERC	Transmission & Wheeling Charges				
1.	APERC	Wheeling Charges for 2006-07	APEPDCL (Rs. kVA/ month)	APNPDCL (Rs. kVA/ month)	APCPDCL (Rs. kVA/ month)	APSPDCL (Rs. kVA/ month)
		33kV	11.28	23.49	32.7	25.03
		11kV	56.41	85.94	91.02	109.43
		LT	224	185.52	126.44	152.06
2.	AERC	132kV – 54p/unit 33kV & below - 112p/unit for LAEDCL, 152p/unit for CAEDCL, 107p/unit for UAEDCL (plus loss in kind)				
3.	CSERC	Transmission Charges (acc., to TO dt. 13-09-06) LTOA – Rs.65639/MW/month STOA – Rs.540/MW/day Wheeling Charges: At 33kV – 17.37 paise/unit				
4.	DERC	OA Notified on 03-01-06, charges yet to be determined				
5.	GERC	Charges for 2006-07				
			Transmission charges			
		LTOA	Rs.2832/MW/day			
		STOA	Rs.708/MW/day			
		Wheeling Charges for 2006-07, Rs.2459/MW/day plus losses in kind for point of injection from 11kV, 22kV, & 33kV to energy delivered at 11kV & at 400V				
6.	HERC	STOA Transmission charges – (Rs./MW/day)				
			6 Hours per day	6 to 12 Hours per day	Above 12 Hours	
			296.38	592.77	1185.54	
7.	HPERC	Procedure of calculation for determination of wheeling charges notified.				
8.	JSERC	Completed				
9.	J&KSERC	Notified in OA regulation but not determined				

10.	KERC	<table border="1"> <tr> <td></td> <td>Transmission charges</td> </tr> <tr> <td>LTOA</td> <td>Rs.10.5 lakhs/MW/day</td> </tr> <tr> <td>STOA</td> <td>Rs.720/MW/day</td> </tr> </table> <p>Wheeling Charges: @ 33/11kV & 5.5% network loss in kind, 10.58 paise/unit</p>		Transmission charges	LTOA	Rs.10.5 lakhs/MW/day	STOA	Rs.720/MW/day		
	Transmission charges									
LTOA	Rs.10.5 lakhs/MW/day									
STOA	Rs.720/MW/day									
11.	KSERC	N/A								
12.	MPERC	<p>Transmission charges: 132kV & above – LTOA - Rs.2728.73/MW/day STOA – Rs.682.18/MW/day</p> <p>Wheeling Charges - specified in OA regulation for 33kV & below</p>								
13.	MERC	<p>Wheeling Charges TPC Network: HT consumers – Rs.150/kW/month REL Network: HT consumers – Rs.35/kW/month</p> <table border="1"> <tr> <td></td> <td>MSEDCL</td> </tr> <tr> <td>33kV</td> <td>Rs.3/kVA/month</td> </tr> <tr> <td>22 & 11 kV</td> <td>Rs.37/kVA/month</td> </tr> <tr> <td>415 V</td> <td>Rs.113/kVA/month</td> </tr> </table>		MSEDCL	33kV	Rs.3/kVA/month	22 & 11 kV	Rs.37/kVA/month	415 V	Rs.113/kVA/month
	MSEDCL									
33kV	Rs.3/kVA/month									
22 & 11 kV	Rs.37/kVA/month									
415 V	Rs.113/kVA/month									
14.	OERC	OA transmission charges fixed at 22p/unit for EHT for the year 2006-07								
15.	PSERC	Charges acc to TO 2006-07								
		<table border="1"> <tr> <td></td> <td>Wheeling charge</td> </tr> <tr> <td>LTOA</td> <td>Rs.3389/MW/day</td> </tr> <tr> <td>STOA</td> <td>Rs.2568/MW/day</td> </tr> </table>		Wheeling charge	LTOA	Rs.3389/MW/day	STOA	Rs.2568/MW/day		
	Wheeling charge									
LTOA	Rs.3389/MW/day									
STOA	Rs.2568/MW/day									
16.	RERC	OA Transmission charges for the year 2006-07 @ Rs.83.96 kW/month								
17.	TNERC	Wheeling charges 14.74p/unit								
18.	TERC	Not yet notified								
19.	UERC	Already provided in the transmission tariff regulations, which states that beneficiaries would share the annual transmission charges on the basis of allocation.								
20.	UPERC	To be determined								
21.	WBERC	Determined in OA regulations for 2005-06								

Annexure 22

Table 20: Time bound program on AT&C losses

S. No.	SERC	Status
1.	AERC	Discoms have initiated a study on AT&C losses in selected 11kV feeders M/s SMEC International Ltd., a consultant as submitted the interim report
2.	CSERC	Board proceeding with T&D loss study. Targets for loss reduction have been given up to 2007-08.
3.	GERC	In TO dt., 06-05-2006, the distribution licensees are directed to prepare a road map to reduce the distribution losses over the next five years (2007-08 to 2011-12). Details regarding Energy Audit also called from unbundled licensees.
4.	JSERC	Consultant appointed for this purpose
5.	J&KSERC	Likely to take more time.
6.	KERC	KERC has furnished a road map to CEA for reduction in T&D losses. Regarding segregation of Technical & Commercial losses, ESCOM have been requested to come up with a suitable action plan.
7.	MPERC	Time bound program issued. MPERC as fixed loss reduction targets for the licensees, after consulting these licensees.
8.	OERC	The commission had conducted sample energy audit initially on five feeders through an independent group of professionals which was followed up for another 20 nos. of 11kV feeders with mixed loads.
9.	TNERC	Internal Audit committee has been formed.
10.	TERC	The distribution licensee as appointed an Energy Auditor who would carry out feeder wise analysis only.
11.	UERC	Trajectory for loss reduction fixed by commission in TO dt., 08-09-03. For Energy audit exercise, commission as given direction to the licensee.
12.	WBERC	Engagement of Consultant in process

Annexure 23

Table 21: Metering Plans

S. No.	SERC	Metering Plan
1.	AERC	TOD meters placed for HT above 150kVA, for categories such as Tea, Coffee, Rubber, Oil & Coal. Third party arrangement for meter testing done at E.T.D.C (Gol org.)
2.	CSERC	Meeting of target of meterisation by March '07 not possible due to n/a of meters. Meters to be procured as per CEA's regulation. Pre-paid metering & meter testing by 3rd party to be introduced.
3.	GERC	All categories metered. For metering of all Agricultural consumers time limit extended up to Dec '07. TOD metering for HT with load above 500kVA, exclusive night use tariff for HT with load above 100kVA already exists.
4.	JSERC	JSEB has no metering plans. Commission is trying to put in place a third party meter testing arrangements.
5.	J&KSERC	The commission has directed the J&K state Utilities to furnish details of metering plan and to install TOD meters.
6.	KERC	TOD meters installed for large consumers. Prepaid meters made compulsory for temporary installations in TO '06. KERC encourages prepaid meters for all consumers. Submission of metering plan by licensees is awaited. Chief Electrical Inspector appointed as 3rd party agency for meter testing.
7.	MPERC	Quarterly plan sought from licensees, accordingly time limits set for 100% meterization by the commission. MPPERC encourages use of pre-paid meters. TOD meters installed for all HT consumers except Railways, Coal-Mines, HT irrigation, PWW & bulk supply exemptees. MPERC invited M/s CPRI for third party meter testing.
8.	OERC	Progress monitored from grid S/S up to consumer end. Status being reviewed every two months.
9.	RERC	All metered except agriculture consumers, time extended up to 09-06-08
10.	TNERC	Time extended to 31-03-09 for installation of meter in agricultural & hut services. Submission of metering plan extended up to 31-12-07. CEIG is the 3 rd party service provider. TOD meters installed in all HT consumers.
11.	TERC	Completion being monitored.
12.	UERC	Directions issued for 100% metering. Penalty imposed for non compliance. TOD implemented on a large scale.
13.	WBERC	Completed

Annexure 24

Table 22: Implementation of HVDS, SCADA & Data base management

<u>S. No.</u>	<u>SERC</u>	<u>HVDS</u>	<u>SCADA & Data Base Management</u>
1.	AERC	HT tariff rates are separately notified & kept lower to encourage the consumers to opt for supply at a higher voltage in TO 2005-06	N/A
2.	CERC	Board has started converting LT system to HVDS. Scheme prepared for two areas for availing REC funds.	SCADA implemented. Sub-station automation in process
3.	DERC	HVDS has been implemented in Delhi after privatization in July 2002. As of now cost effective action (ABC) Ariel Bunched Cables, is being utilized considering the clearances required for HVDS system.	Process already underway. The SCADA /DMS are expected for completion by end of financial year 2006-07 in 3 Discom areas.
4.	GERC	N/A	SCADA work is almost completed through consultancy assignment to PGCIL.
5.	JSERC	The commission has noted the issue but no action	Not yet decided
6.	J&KSERC	To be taken care in the 1st Tariff Order.	Commission has already directed licensees to furnish details upon the matter. Results awaited
7.	KERC	KERC has been promoting to reduce LT/HT ratio. ESCOM have been requested to send suitable proposals.	Proposals awaited from ESCOM
8.	MPERC	MPERC advised the Discoms to prepare schemes to promote HVDS. Two licensees implemented it on pilot project basis. The	Licensees are directed to submit a time-bound programme and also directed to take up appropriate measures such as preparation

		commission has obtained Investment plan of the discoms on the said matter.	of implementation schemes.
9.	MERC	HVDS introduction in MSEDCL area is being undertaken by APDRP scheme for limited circles.	As far as MSEDCLs concerned, sample implementation of SCADA to cover 10 towns has been initiated REL – SCADA covering 50 receiving stations are already in operation
10.	OERC	Adoption of HVDS for rural network has been directed by commission since June '03 in RST order 2003-04	TCS has been assigned the work, due to fund constraints, no progress has been achieved. Commission has expressed that the DISCOMs should place at least 132 kV loads on SCADA as a start.
11.	TNERC	Licensee has been directed to improve HT/LT ratio 1:1.5 in the distribution code	TNEB has reported to have planned to complete SCADA in a years time
12.	TERC	Yet to come	Scheme yet to be prepared
13.	UERC	The commission has directed all loads above 75kW on HT.	N/A
14.	WBERC	Time consuming. Study by consultant under process.	Action not yet started

Annexure 25

Table 23: Norms for Standard of Performance

<u>S. No.</u>	<u>SERC</u>	<u>SoP – Date of Notification</u>	<u>Summary</u>
1.	APERC	2004	Notified and amended in 2005
2.	AERC	Feb 4, 2005	Regulation notified and is effective
3.	CSERC	July 5, 2006	SoP has already been notified along with Supply Code. Penalties for delay in consumer services have also notified.
5.	GERC	March 31, 2005	Notified with provision for penalties in case of non-performance of distribution licensee.
6.	HERC	July 16 th , 2004	Notified
7.	HPERC	2005	Notified
8.	JSERC	August 12 th , 2005	Notified
9.	J&KSERC	June 19, 2006	Regulations already notified on 19-06-06.
10.	KERC	June 10, 2004	Regulations issued.
11.	KSERC	May 9, 2006	Notified
12.	MPERC	July 13, 2004	Notified
13.	MERC	January 20, 2005	Notified
14.	OERC	Notified	The commission has approved a Business plan with incentive for improved AT&C loss.
17.	TNERC	Notified	SoP regulation indicating the levels of performances already put in place. Arrangements for sharing the gains of efficient operations with the consumers are provided for in the Tariff Regulations.
18.	TERC	Yet to come	Scheme yet to be prepared
19.	UERC	Not Notified	Regulations is being prepared
20.	WBERC	Not Notified	Consultant is in the process of appointment. It is targeted to be implemented from 2008-09.

Annexure 26

Table 24: Setting up of CGR Forum & Ombudsman

<u>S. No.</u>	<u>SERC</u>	<u>CGR Regulation</u>	<u>Summary</u>
1.	APERC	2004	Notified
2.	AERC	Notified	CGR forum in 3 Discoms, Ombudsman not appointed.
3.	CSERC	July 5, 2006	CGR established in 3 centers. Ombudsman appointed, and both are functional.
4.	DERC	March 11, 2004	CGR & Ombudsman is functioning from August 2004.
5.	GERC	March 31, 2005	CGR forum in 8 centers. Secretary-GERC appointed as Ombudsman with effect from August 5, 2005.
6.	HERC	Notified	UHBVNL, DHBVNL have set up CGR forum both are functional. Ombudsman is designated.
7.	HPERC	Notified	HPSEB, the only licensee has constituted CGR forum during June, 2005. Ombudsman appointed during December 2004.
8.	JSERC	Notified	CGR forum formed in all Discoms except in DVC. Ombudsman too has been appointed.
9.	J&KSER C	No provision	No provision in J&K Act-2000
10.	KERC	June 10, 2004	CGR constituted in all five discoms. Commission has appointed Ombudsman
11.	KSERC	2007	Draft Notified
12.	MPERC	Notified	Commission issued guidelines for constitution of CGR. One forum for each of the discom is established and is functional. Ombudsman appointed and is functional.
13.	MERC	2006	Notified
14.	OERC	Notified	Commission has already appointed four Ombudsmen & has established 12 grievance redressal forums for the state.
15.	RERC	Notified	CGR formed for the licensees. Ombudsman formed for each of the three licensees.
16.	TNERC	Notified	CGR & Ombudsman regulations specified and functioning

17.	TERC	Notified	CGR formed and Ombudsman appointed.
18.	UERC	Notified	Two CGR and one Ombudsman functional.
19.	UPERC	December 9, 2003	Notified
20.	WBERC	Notified	CGR and Ombudsman established. Commission provides in its guidelines at least one GRO at each sub-district, district, region, zone, head quarter in each organization of the licensee.

Annexure 27

Table 25: Capacity Building for Consumer Groups

S. No.	SERC	Summary
1.	AERC	12 Consumer groups have been empanelled under Consumer Advocacy Cell. A quarterly info bulletin "The Electricity Consumer Grid" published.
2.	CSERC	Consumer Advocacy Cell set-up placed. Few NGOs registered. A two day seminar organized by NGO to educate the consumers on the regulatory regime.
3.	GERC	Representatives of various consumer groups are made member of State Advisory Committee as well as Supply code Review panel.
4.	JSERC	This is an on going process and the commission is carrying out required activities.
5.	J&KSERC	The Commission has taken note of this issue.
6.	MPERC	T&C of tariff regulations framed under section 61 have this provision.
7.	OERC	The commission depicts its concern that the consumers should be made aware of their rights regarding performance standards to be made available to them by the licensees. The recognized Consumer Associations have been asked to participate in verifying the overall performance data. Yet lot more needs to be done.
8.	TNERC	The commission has appointed a Consumer Advocacy Officer. This officer is coordinating with the consumer group. Consumer centric periodical, Newsletters, etc are sent free of cost to consumer organization, groups and association
9.	TERC	Under process and awareness campaign – open public discussion being held.
10.	UERC	Commission has already started the process of encouraging the consumer groups/NGO's to work with the commission on various issues.
11.	WBERC	No action taken. Programme is in the process of preparation.

Annexure 28

Table 26

Regulatory Compliance of SERCs under EA'03

SECTION	REGULATION	TOTAL	Assam	A.P.	Chattisgarh	Delhi	Gujrat	Haryana	H.P.	Jharkhand	Karnataka	Kerala	Maharashtra	M.P.	Orissa	Punjab	Rajasthan	T.N.	Uttaranchal	U.P.	West Bengal
181/2/p-42/2	Progressive Reduction & Elimination of surcharge and cross-subsidies	15	√	√	√		√	√		√**		√	√	√	√	√	√		√	√	√
181/2/j-39/2/d/ii	Reduction & Elimination of surcharge and cross-subsidies for facilitating Open Access(Distribution Licencee).	8	√					√		√	√		√				√	√		√	
181/2/k-39/2/d/ii	Manner and Utilisation of payment of surcharge for Open Access (Distribution Licencee).	8	√		√					√**	√		√				√	√		√	
181/2/m-40/c/ii	Reduction & Elimination of surcharge and cross-subsidies for facilitating Open Access(Transmission Licencee).	6	√							√			√				√	√		√	
181/2/o-41	Treatment of part of income as may be specified by commission from Other Business of Transmission licensee	11	√	√		√	√		√			√	√	√		√		√		√	
181/2/y-51	Treatment of part of income as may be specified by commission from Other Business of distribution licensee	11	√	√		√	√		√		√	√	√			√		√		√	

SECTION	REGULATION	TOTAL	Assam	A.P.	Chattisgarh	Delhi	Gujrat	Haryana	H.P.	Jharkhand	Karnataka	Kerala	Maharashtra	M.P.	Orissa	Punjab	Rajasthan	T.N.	Uttaranchal	U.P.	West Bengal
181/2/z-52/2	Regulations for Intrastate Electricity Trader	9	✓	✓		✓	✓						✓	✓		✓ ^{**}	✓			✓	
181/2/za-57/1	Licensee's Standard of Performance	18	✓	✓	✓	✓ [^]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓ ^{**}	✓	✓		✓	✓
181/2/zc-61/g	Period within which mitigation and elimination of cross subsidies	2							✓							✓					
181/2/zi-66	Development of market in power including trading as per National Electricity Policy	1																		✓	

** Draft Regulation

^ draft regulations

Annexure 29

Table 27

Score Card to judge level of competition achieved in States of India

Parameters for creation of competitive Environment	Max. Score	Min. Score	Assam	A.P.	Chattisgarh	Delhi	Gujarat	Haryana	H.P.	Jharkhand	Karnataka	Kerala	Maharashtra	M.P.	Orissa	Punjab	Rajasthan	T.N.	Uttaranchal	U.P.	West Bengal	
Time frame for introduction of open-access in the state.	6	0	4	6	6	5	6	5	5	4	6	5	5	4	6	5	5	5	4	6	4	
Extent to which open-access is facilitated or hindered through levy of excessive wheeling charges, cross-subsidy surcharge	12	0	4	8	8	3	10	4	4	2	8	2	8	4	4	4	6	0	6	7	5	
Policies regarding captive generation – whether there are any discriminatory	8	0	4	6	6	0	6	0	0	1	2	0	0	4	0	0	0	4	4	2	4	
ED or excessive cross-subsidisation surcharge impacting the viability of captive generators	8	0	2	0	0	2	6	4	2	0	4	2	2	4	4	4	5	5	4	5	0	
Progress in terms of segregating the sector on functional lines	8	0	3	3	5	4	6	5	3	3	6	6	5	2	6	3	6	4	4	3	3	
Progress in terms of introducing intra-state ABT	8	0	1	5	5	3	6	4	2	1	6	0	4	1	4	0	2	0	5	1	4	
Total Score	50	0	18	28	30	17	40	22	16	11	32	15	24	19	24	16	24	18	27	24	20	22