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**and**

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*MASTER DEGREE THESIS*

**POWER DISTRIBUTION REFORMS - OPPORTUNITIES AND  
MARKETING STRATEGY FOR BHEL TOWARDS TURNKEY  
SOLUTIONS FOR DISTRIBUTION OF POWER**

Ljubljana, September 2004

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### **Author's Statement**

I, Harjeet S. Kalsi, hereby certify to be the author of this Master Degree thesis, which was written under mentorship of .Prof. Andrej Kumar and in compliance with the Act of Author's and Related Rights – Para. 1, Article 21. I herewith agree this thesis to be published on the website pages of ICPE and the Faculty of Economics.

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## PREFACE

After electricity was first introduced in the 1880s in the United States and Europe, its use expanded dramatically throughout the world, transforming almost every aspect of daily life. It is now essential to the operation of most modern technological systems, and it is not surprising, therefore, that electricity supply is often viewed as an essential public good in contemporary society. The electricity systems developed over the last century mainly rely on large-scale power plants and extensive networks of transmission and distribution that deliver electricity at affordable prices (at least, in most industrial countries).

For nearly a century, electricity around the world was typically produced by vertically integrated utilities, which operated facilities for all three stages of electricity service: generation, transmission, and distribution. In many cases, utilities were state-owned monopolies. The involvement of the public sector in the electricity industry is partly explained by the sector's technical and economic evolution. As utilities pursued economies of scale both in supply and in demand, electricity systems became highly centralized. Creating a electric power network is a highly capital-intensive project with long payback periods (but significant society-wide benefits), and, as a result, has required public sector oversight of electricity supply in many countries.

A series of proposals during the late 20th century sought to address issues of power shortages, as well as capital shortages suffered by developing country public sectors. Reforms introduced in the institutional framework of the electricity industry that are associated with power liberalization, are justified by advocates on several grounds. It is argued by many that the merits of monopoly in electricity generation have disappeared because economies of scale associated with centralised power plants have been exhausted. Continued monopoly supply under these circumstances would only hinder the introduction of new technologies. Others point to the fact that governments in many countries are experiencing financial strain in mobilising capital for investments in electricity infrastructure .

The Indian electric power industry now stands at the threshold of complete de-regulation after having completed a phased move in that direction. The reforms being implemented are going to change the concept of marketing in the distribution sector with focus on turnkey projects. The setting up of an independent power project on a turnkey basis wherein a contractor is given overall responsibility from concept to commissioning is 2-3 decades old. In the last 7-10 years the turnkey concept has grown in demand and the pace

set has been unprecedented. The opening of the Indian Economy and the impetus on rapid Industrialization has further imparted importance to the concept of turnkey projects.

Turnkey project operations are one of the dominating modes of international business today, as the "products" of industrial companies increasingly exhibit project-like features. This is due to the increased complexity and "systemization" of the offerings of many international companies. This implies that industrial marketers have to develop their capabilities in supplying ever more complex "total solutions" that include both tangible (products) and Intangible (services) aspects. Thus, it is not surprising that turnkey projects, turnkey project management, and turnkey project marketing have recently received increased scholarly attention.

An attempt has been made in this study, to understand the changing environment in the power distribution sector in India and in relation to the global developments and to analyze if the equipment manufacturers can take up the challenge of performing the job of an EPC contractor, on turnkey basis. To study the reform process and analyze, the shift towards the turnkey procurement from the traditional method of loose equipment purchase.

In the present scenario, when the environment is changing rapidly, a firm simply cannot make decisions based on long standing rules, historical policies or simple extrapolations of current trends. Instead they must look to the future as they plan organization wide objectives, initiate strategy and set policies. The environment is becoming more and more complex and living with uncertainty is the managements biggest challenge. To survive in the fierce competition that a marketer finds himself in, he has to adopt different strategies : it tries to be different from the rest by offering services no one else can; by trying to be lowest priced etc. But these strategies are not practical for most as only few companies have the economy of scale or scope to be price leaders. The key to winning is to focus on the one thing the competitors can never beat or duplicate – creating irresistible customer relationships; strong relationships are one's one and only source of sustainable advantage.

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## ***Glossary of Terms***

ABB	Asea Brown Boveri
ADB	Asian Development Bank
AECO	Ahmedabad Electric Company
APERC	Andhra Pradesh Electricity Regulatory Commission
APDRP	Accelerated Power Development and Reform Programme
APSEB	Andhra Pradesh State Electricity Board
APDISCOMS	Andhra Pradesh Distribution Companies
BHEL	Bharat Heavy Electricals Limited
BSES	Bombay Suburban Electric Supply
CAP	Capacitor
CB	Circuit Breaker
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CGL	Crompton Greaves Limited
CPP	Captive Power Project
C&RP	Control & Relay panel
CT	Current Transformer
CVT	Current Voltage Transformer
DVB	Delhi Vidyut Board
DISCOM	Distribution Company
EFE	External Factor Evaluation
EHV	Extra High Voltage
EPC	Engineering, Procurement & Construction
ERC Act	Electricity Regulatory Commissions Act (1998)
FDI	Foreign Direct Investment
GENCO	Generation Company
GIS	Gas Insulated Substation
Gol	Government of India
HT	High Tension
HVPNL	Haryana Vidyut Parishad Nigam Limited
HQ	Head Quarters
IEEMA	Indian Electrical & Electronics Manufacturers Association
IFE	Internal Factor Evaluation
IBRD	International Bank for Reconstruction and Development
IDBI	Industrial Development Bank of India
IDFC	Infrastructure Development Finance Company Ltd
IPP	Individual Power Producers
JIB	Japanese International Bank
KEGOC	Kazakhstan Energy Grid Operating Company

MIS	Management Information System
MPSEB	Madhya Pradesh State Electricity Board
PGCIL	Power Grid Corporation of India Limited
PSEB	Punjab State Electricity Board
PSU	Public Sector Undertaking
PT	Potential Transformer
ROD	Regional Operations Division
SCADA	Supervisory Control and Data Acquisition
SEB	State Electricity Board
SEBs	State Electricity Boards
SEC	Surat Electric Company
SPACE	Strategic Positioning and Action Evaluation
T&D	Transmission & Distribution
TRF	Transformer

# **Chapter 1 - Introduction.**

## **1.1 Description Of The Problem**

Power is a critical infrastructure for the growth of Indian Economy. Acceleration in the economic growth will depend upon a financially and commercially viable power sector that is able to attract fresh investments (*Powerline India, March 2003, p.32.*). However, the financial health of State Electricity Boards (SEBs) has become a matter of grave concern considering that their losses have reached an alarming level of Rs. 260 billion ( about 4700 million Euros) that is equivalent to about 1.5% of GDP in 2002-03. World Bank estimates this loss would increase to Rs. 400 billion (7150 million Euros) in the next five years, unless this trend is halted with corrective steps. Out of total energy generated, approximately only 55% is billed and only 41% is realized. The gap between average revenue realization and average cost of supply has been constantly increasing. During the year 2001-02, the average cost of supply from State Electricity Boards (SEBs) was Rs.3.04 per unit and the average revenue realization was Rs.2.12 per unit (*IEEMA Journal, Feb. 2003, p. 24.*).

The major factors responsible for financial sickness of SEBs are (*IEEMA Journal Sept 2002, p. 18 & 19*) :

- Skewed tariff structure leading to unsustainable cross subsidies by State Government.
- Huge Transmission & Distribution (T&D) losses, largely due to outright theft and unmetred supply. It has been estimated that theft alone causes loss of about Rs. 200 billion (3500 million Euros) annually.
- Lack of accounting and accountability in distribution.
- Large man power – 27 to 30% revenue is used for establishment charges
- Outdated rules, regulations, management structure and practices
- Unstable Top Management

The government has initiated the following steps in an attempt to reform the power distribution in the country (*URL:<http://www.powermin.nic.in>, 24/03/2004.*

To bifurcate / trifurcate the State Electricity Boards (SEBs) into Generation, Transmission and Distribution companies. This is being done to improve the accountability of people as to which sector is showing losses despite combined efforts of the state and the State Electricity Boards (SEBs).

1. To meter the total power at different ends and achieve 100% metering.
2. To increase the flow of funds in the distribution sector through financial institutions, soft loans and government funding.
3. To encourage private participation in the distribution of power as this segment is greatly marred by politics leading to high losses.

The above reforms are going to change the concept of marketing in the distribution sector with focus on turnkey projects. The setting up of an independent power project on a **turnkey basis** wherein a contractor is given overall responsibility from concept to commissioning is 2-3 decades old. **In the last 7-10 years the turnkey concept has grown in demand and the pace set has been unprecedented. The opening of the Indian Economy and the impetus on rapid Industrialization has further imparted importance to the concept of turnkey projects.**

Considering the importance of Turnkey projects and its rapid advancement in the present scenario, it obviously has become important for any organization dealing in power Transmission & Distribution equipment and turnkey projects, to have a systematic and structured approach to all the marketing aspect of the projects, to encounter the various challenges thrown due to rapidly changing environment. Also with the growth in investment in Transmission & Distribution sector, the trend is likely to get a boost. **Besides this, the break up of SEBs into distribution companies and private participation, has led to slim organizational structure. Thus, the concept of doing it them selves is giving way to outsourcing.**

With the need of improving power distribution and power sector reforms, the trend of **Turnkey concept**, which was popular in Generation and Transmission sector ( higher voltage class ), is now picking up in distribution sector (lower voltage like 33kV & 11kV). The transmission voltages are above 33kV and distribution voltages are up to 33kV.

The quality of regulation within the power sector is key to the investment climate. It determines the rules for investment finance and private participation. Effective regulation mobilizes investment finance at minimum cost and ensures good performance, the benefits of which can be passed on to consumers. The alternative to effective regulation is sovereign finance, but this is neither desirable from an incentive point of view, or in many cases, practical.

**Some of the factors affecting the global power markets include:**

- The collapse of Enron, which resulted in electricity companies retrenching, focusing on domestic markets and increasing equity backing to restore credit ratings
- Low electricity prices in the US and UK markets, which resulted in losses for investors
- The currency collapse in Argentina, which adversely affected US and European investors, and
- The failure of investments (e.g. backed by Power Purchase Agreements in Pakistan), which raised perceptions of sector risk.

As a result of these events, US investors, and some European investors, have changed their strategy towards transition economy power sectors. For example, the American utility AES considered selling its interests in the Georgian Telasi Distribution Company and in its distribution assets in Ukraine. However, the company has now decided to remain in these countries, but has shelved plans for further expansion. Elsewhere, the American utility Energy has sold part of its interest in a Bulgarian power generation rehabilitation project . (*URL:<http://www.ebrd.com/pubs/econ/working>*), 23.04.2004

In view of above developments, with not much Foreign Direct Investments (FDI) flowing into India's Transmission and Distribution sectors, there is much dependence on the domestic public and private sectors, which in turn depend on finance from external lending agencies. The concept of turnkey solutions is being insisted by International lending agencies such as World Bank, International Bank for Reconstruction and Development (IBRD), Asian Development bank (ADB), Japanese International Bank (JIB) etc., to ensure quality solutions within estimated cost and time frame. 26 nos. tenders floated in 2003-04 (from April 2003 to March 2004) in India, for distribution substations financed by IBRD, ADB and JIB, the specification were for Turnkey supply of equipment and execution. (*Tender register of BHEL Projects Division, April 2004*)

The project has been undertaken specifically in the above context, to understand the various aspects of marketing of turnkey projects and the marketing strategy for turnkey solution providers in the Transmission and Distribution of Power. The project attempts to identify the correct marketing strategy for an equipment manufacturer planning to be an EPC contractor, due to the uncertainties presently involved in the market scenario.

## **1.2 Research Objectives**

The objective of the Master Thesis is to understand the changing environment in the power distribution sector in India and in relation to the global developments, and to analyze if the equipment manufacturers can take up the challenge of performing the job of an Engineering, Procurement & Construction (EPC) contractor. To study the reform process in India as compared to the other parts of the world and analyze, the shift towards the turnkey procurement from the traditional method of loose equipment purchase. In the process to determine the marketing strategy towards turnkey solutions in distribution of Power with specific reference to Equipment Manufacturer as EPC Contractors. The broad objectives may be further split as below :

1. To study the relevant concepts of marketing and strategic management, required to formulate strategies to market Turnkey solutions to electric distribution companies.
2. To appreciate the electric power scenario and reforms implemented in the power sector around the world, as compared to India and to have an understanding of the business environment in the power distribution business in India as per following parameters:
  - a. Current status
  - b. Government initiatives in the area
  - c. Likely effect of the reforms
3. To analyze the buying pattern of the SEBs / Utilities in India in the pre reform era and the effect of the reforms on the buying pattern of the customers in India.
4. To assess the forthcoming demand in the electric power distribution business in India, based on the following parameters
  - a. Demand Estimation
  - b. Priority of requirement in the area
  - c. Breakup of demand in product & services and turnkey solutions
5. To understand the customers perceptions about the marketing elements of the major players in India, in terms of
  - a. Quality of products
  - b. Price of the products
  - c. Delivery commitment

- d. Reliability of the products
  - e. Ability to offer after sales services
  - f. Ability to be a turnkey solution provider
  - g. Importance placed upon technology and financial strength
  - h. Preference in terms of awarding the contract to EPC contractors Vs Equipment manufacturers
6. To propose a marketing strategy for equipment manufacturers to be successful as EPC contractors.

Based on the study and analysis of above data, to get an insight of the requisite marketing strategy for the equipment manufacturers in providing turnkey solutions to electric distribution companies.

### **1.3 Methodology**

The following methodology was adopted

- Literature survey
- Market Analysis in India with use of specific questionnaire for collecting primary data and relevant comparison to the world developments
- Development of strategy for marketing turnkey solutions

#### **1.3.1 Literature Survey**

For formulating marketing strategies, it is imperative to understand the concepts of marketing management with specific reference to Industrial Marketing, as turnkey solutions for power distributions can be considered as Industrial Product. It is also necessary to understand the concepts of strategic management with particular reference to marketing strategy. Also it is an essential requirement, to understand the electric power scenario and the reforms being carried out in this sector in India as compared to elsewhere in the world. The literature survey was carried out by reviewing the books and articles of renowned authors to build up the framework for formulation of marketing strategy for providing turnkey solutions for power distribution.

#### **1.3.2 Market Analysis**

The analysis involved

- The study of environment
- Estimation of plan investment and likely impact in terms of products and services
- Data collection from both primary and secondary sources.



Primary data collection has been done by questionnaire method undisguised, structured form. Sample Customers were taken from existing and prospective users – State Electricity Boards (SEBs), Industries, Contractors, Consultants and Independent Power Producers (IPPs). The data collected was analytically examined. The responses were categorized on the various variables that affect the buying behavior of the organization. The factors determining customer satisfaction, which affect repeat purchases, were also critically examined.

Secondary data collection has been done by referring to Indian Electrical and Electronics Manufacturers Association's (IEEMA) monthly journals, IEEMA production figures, National Power Plan (1997-2012), APDRP figures and compilation of Notice Informing Tenders (NITs) published in last 6 months.

A study was made on the market scenario, market identification of turnkey solution concept, identification of the competition and the customer. The analysis of the research data was made as the backdrop of this study.

In order to understand the actual requirement of the customer, data collection has been linked with the objective of the study in each step.

### **1.3.3 Questionnaire**

The questionnaire has been designed in such a way so to get the exact viewpoint of the customer about the shift towards turnkey concept. The questionnaire also aims to establish the buying pattern of the customer. It is designed with close-ended questions only.

While designing the questionnaire, a wide range of parameters and the variety of customers have been given due considerations. The various customers have specific requirement and expectation. The questions have tried to probe the various clients on the basis of factors influencing purchase and satisfaction. The questionnaire also tries to explore the respondent about organizational changes / buying behavior changes in response to the power sector reforms and increased level of procurement.

The questions have been mostly objective with multiple options. The respondents have been asked to rate the various companies giving due consideration to the factors influencing buying behavior. They have also been asked to rate the various characteristics on the basis of importance and weight age given in the decision process.

Some questions have been designed so as to obtain relevant information of the profile and nature of the company so that the responses can be categorized and effectively analyzed.

The sample questionnaire was given pilot testing on few customers. The response obtained enabled this researcher to do modification so as to get more effective responses.

The details of the Questionnaire are placed in Annexure I & II and the response analyzed in Chapter 5.

### **1.3.4 Sampling**

The sampling process considered to interview / get the response from at least one respondent from each customer segment in the power distribution sector to ascertain objectives. The samples had not been drawn at random but chosen such that the samples are involved in this type of business activity and are aware of the various facets of turnkey concept to give correct opinion towards the above.

The study was conducted through marketing officials of Bharat Heavy Electricals Limited (BHEL) in Regional Operations Division (ROD) located all over India, who could explain the need of correct answers to the respondents. The same was also verified by the personal interview conducted by a parallel person in the same customer segment. The respondents were mainly from the purchase and the operations department of the customers. The study was conducted during the period of May'04 to July'04.

Five samples have been drawn from each customer segment i.e. SEBs, Utilities, IPPs, Consultants and Contractors. In sampling special emphasis have been given to SEBs, which are more progressive like Haryana Vidyut Parishad Nigam Limited (HVPNL), Punjab State Electricity Board (PSEB), Delhi Vidyut Board (DVB), Andhra Pradesh Distribution Companies (APDISCOMS), Karnataka Power Distribution Companies (KPDISCOMS) and Madhya Pradesh State Electricity Board (MPSEB). The personal interviews were conducted with respondents from Central Electricity Authority (CEA), Power Grid Corporation of India Limited (PGCIL), Bharat Heavy Electricals Limited (BHEL), Asea Brown Boveri (ABB) and ALSTOM. This ensured a great variation in terms of respondent that included actual customers, policy makers and major suppliers.

### ***1.3.5 Development of Strategy for Marketing Turnkey solutions***

Recommendations have been formulated based on the above literature survey and market analysis, highlighting the key issues & concerns as well as actions to be initiated and means required for improving business.

## ***1.4 Limitations***

The limitations could be due to certain biases, which exists in individuals mind towards a particular aspect of an industry or a company based on his past experience with it. Due to such limitations the results may be slightly different than what it should have been. The choice of the samples is also a limitation based on the researcher's understanding of the subject.

## ***1.5 Scheme Of Chapters***

The thesis has been presented in six chapters with the bibliography at the end. The scheme of chapters is as follows :

### ***Chapter 1 : Introduction***

In this chapter which is the present one, a brief description of the problem handled in the thesis is given. The purpose of the thesis, the methodology adopted, the limitations and the schemes of the various chapters are presented.

### ***Chapter 2 : Concepts of Marketing and Strategic Management***

This chapter provides overview about concepts of Industrial Marketing and Relationship Marketing as relevant to the industrial product i.e. Electric Power Distribution Sub-Station. It also provides an overview of the strategic management process with particular reference to formulation of marketing strategy.

### ***Chapter 3 : Electric Power Sector Scenario***

This chapter provides an overview of the electric power sector scenario in the world and in India. The major policy initiatives taken in India to improve the transmission and distribution of electric power have been discussed in detail here. The need of electric power sector reforms and its implications are described and compared to those in the developed and other developing nations. The existing level of competition from existing and potential competitors as well as major customers for electric power distribution sub-stations in India have been identified and analyzed.

#### ***Chapter 4 : Demand Estimation***

Demand estimation is the most important segment of the report and forms the basis for the analysis and formulation of the marketing strategies. This chapter contains information obtained from the secondary sources and tries to establish a link with the primary data collected. This chapter also tries to explain the various areas where the investments are planned and seems to forecast the exact time and the quantum of investments. An attempt has been made to establish the priorities of investment through logical reasoning and the results of the responses from the customers.

#### ***Chapter 5 : Analysis***

The data obtained from the questionnaire and the study of the business environment has been segregated as per the objective of the report and this chapter provides insights to the findings of the study. The business environment scan results are analyzed in terms of buying behavior during pre-reform and post reform periods, and comparison made between them. This chapter also provides the analysis of customer preferences, competition, major areas of growth and strategies of major equipment manufacturers. TWOS matrix generated from SWOT analysis is tabulated with Strength-Opportunities (SO), Strength-Threats (ST), Weakness-Opportunities (WO) and Weakness-Threats (WT) strategies, besides External Factor Evaluation (EFE), Internal Factor Evaluation (IFE) and Strategic Positioning & Action Evaluation (SPACE) matrix enabling formulating of marketing strategies.

#### ***Chapter 6 : Conclusion***

In this chapter, the entire study and findings have been summarized and recommendations given. It also includes the key issues of concern and identifies actions and means required for improving business.

#### ***Bibliography***

The bibliography comprising of books, articles, reports and other sources used in the preparation of the thesis has been listed.

## **Chapter 2 – Concepts Of Project Marketing and Strategic Management**

Turnkey project operations are one of the dominating modes of international business today (*Hadjikhani, 1996, p.319-36*), as the “products” of industrial companies increasingly exhibit project-like features (*GuÈnter and Bonaccorsi, 1996, p. 531-7*). This is due to the increased complexity and “systemization” of the offerings of many international companies. This implies that industrial marketers have to develop their capabilities in supplying ever more complex “total solutions” that include both tangible (products) and Intangible (services) aspects (*GroÈnroos, 1997,p.9*). Thus, it is not surprising that turnkey projects, turnkey project management, and turnkey project marketing have recently received increased scholarly attention (see e.g. the project management special issue of *Scandinavian Journal of Management*, 1995; the project marketing and systems selling issue of *International Business Review*, 1996; *Hadjikhani, 1998, p.319-36*).

There is also an issue-based research group called the International Network for Project Marketing and System Selling or INPM (*Cova and Ghauri, 1996, p.139-140; GuÈnter and Bonaccorsi, 1996, p.534*). Closely affiliated with the IMP (Industrial Marketing and Purchasing) community of researchers, the INPM’s research emphasizes the role of relationships and networks of relationships in project marketing. In the 1990s, relationship marketing and management were established as key areas of research (*GroÈnroos, 1997, p.15*).

The process of acquiring and delivering projects entails co-ordinating the activities of buyers and sellers, as the details of each project are agreed during often-extensive interaction between the two sides. The relationships between employees in the buying and selling firms are therefore important before, during and after delivery. The term “project marketing” embraces all this. Project marketing is a wider term than project management. It always implicitly includes project management, but not vice versa. Marketing of turnkey solutions for electric distribution substation is synonymous with project marketing which in turn encompasses relationship and industrial marketing

### **2.1 Concepts Of Relationship Marketing**

In today’s information overloaded society, traditional concepts of promotion don’t work. Thanks to the most instant access to data, products and services are becoming commodities at an alarming rate. Buyers are smart. They know what they want and

they don't believe the hype. What's the marketer to do? Be different; offer services no one else can; be the lowest priced. Unfortunately for most companies, these strategies are not practical. Few companies have the economies of scale or scope to be price leaders. And at the other end of the segment, in the niche markets, there is often not enough business to survive.

If one's business is like most, one needs to win in the middle markets. But this is the place, where competition is the greatest and differentiation is most difficult. In the middle market, the key to winning is to focus on the one thing the competitors can never beat – creating irresistible customer relationships.

Competitors can copy one's products and services, and lower prices, but they can never duplicate the relationships one has with the customers. Strong relationships are one's own and only source of sustainable competitive advantage.

For marketers, the implications are obvious. They must create and nurture life long bonds with customers and should implement a process of relationship marketing.

### **What is Relationship Marketing ?**

The term relationship marketing has been used to reflect a variety of themes and perspectives. Some of these take a narrow functional marketing perspective, whereas others employ a view that is broad and somewhat paradigmatic in approach and orientation.

One example of a narrow perspective of relationship marketing is database marketing that emphasizes the promotional aspect of marketing linked to database efforts (*Bickert, 1992, p.14-18*). Another view considers relationship marketing only as customer retention, in which a variety of after marketing tactics are used for customer bonding or staying in touch after the sale is made (*Vavra, 1992, p.112*). A more popular approach with recent application of Information Technology is to focus on individual or one to one relationships with customers that integrate database knowledge with long term customer retention and growth strategy (*Peppers & Rogers, 1993, p.85*). Thus *Shani and Chalasani* (1992, p. 33) define relationship marketing as “ an integrated effort to identify, maintain, and build up a network with individual customers and to continuously strengthen the network for the mutual benefit of both sides, through interactive, individualized and value added contacts over a long period of time”. *Jackson (1985, p.18)* applies the individual account concept in industrial markets to define relationship marketing as “marketing oriented towards strong, lasting relationships with individual accounts”.

McKenna (1991, p.29 ) offers a more strategic view of relationship marketing by putting the customer first and shifting the role of marketing from manipulating the customer (telling & selling) to genuine customer involvement (communicating & sharing knowledge). Berry (1993, p.25-38) in somewhat broader terms, also has a strategic viewpoint in relationship marketing and defines relationship marketing as “ attracting, maintaining and in multi-service organizations – enhancing customer relationships”.

Creation and enhancement of mutual economic value are thus the purposes of relationship marketing; thus a very widely accepted definition of relationship marketing is – the *ongoing process of engaging in co-operative and collaborative activities and programs with immediate and end user customers to create and enhance mutual economic value at reduced cost* (Sheth & Parvatiyar, 2000, p.44). There are three underlying dimensions of relationships formation. These three dimensions can be used to demonstrate a process model of relationship marketing.

### **A Process Model of Relationship Marketing**

Anchored to the definition of relationship marketing as process of engaging in cooperative and collaborative relationships with customers and building upon the works of various scholars who have examined buyer – seller relationships from the same view point (Borys & Jemison, 1989,p.234-239; Dwyer et al.,1987, p.11-27; Evans & Laskins, 1994, p.439-452; Wilson, 1995, p.335-345). Sheth and Parvatiyar have developed a four stage relationship marketing process model. The broad model suggests that the process comprises of four sub processes: formation process, management and governance process, performance evaluation process and enhancement process.

### **Relationship Marketing Purpose**

The overall purpose of relationship marketing is to improve marketing productivity and enhance mutual value for the parties involved in the relationship. Relationship marketing has the potential to improve marketing productivity and to create mutual values by increasing marketing effectiveness and/or improving marketing efficiencies (Sheth & Paravatiyar, 1995b, p.255-271; Sheth & Sisodia, 1995, p.182-284). By seeking and achieving strategic marketing goals – such as entering new markets, developing new products or technologies, serving new or expanded need of customers, and redefining the competitive playing field – firms can enhance their marketing effectiveness. Similarly by seeking and achieving operational goals – such as streamlining of order processing, inventory management and reduction of the burden of excessive customer acquisition costs – firms can achieve greater marketing efficiencies. Thus stating the objectives and defining the purpose of relationship

marketing can help firms to clarify the nature of relationship marketing programs and activities that ought to be performed by the partners. Defining the purpose also helps firms to identify suitable relationship partners who have the necessary expectations and capabilities to fulfill the mutual goals. It can further help firms to evaluate relationship marketing performance by comparing results achieved against objectives. These objectives could be specified as financial goals, marketing goals, strategic goals, operational goals and general goals.

### 2.1.1 Relationship Marketing Programs

Table 2.1 displays the various types of prevalent relationship marketing programs.

**Table 2.1 : Types of Relationship Marketing Programs**

	Customer Type		
Program type	Individual Consumers	Distributors/ Resellers	Institutional buyers (Business to Business)
Continuity Marketing	Loyalty Programs	Continuous replenishment and ECR programs	Special supply arrangements (eg JIT, MRP)
Individual Marketing	Data warehousing & Data Mining	Customer Business Development	Key Account Management
Co-Marketing / Partnering	Co-branding	Co-operative Marketing	Joint Marketing and co-development

*Source : Sheth, J.N., & Parvatiyar, A., Handbook of Relationship Marketing; Sage Publications Inc., London, 2000, p.47 (ECR – Efficient Customer Response; JIT – Just In Time; MRP – Material Resource Planning)*

A careful review of the literature and observation of Corporate practices suggest that there are three types of Relational Marketing programs : continuity marketing, one to one marketing and partnering programs. These take different forms depending on whether they are meant for end consumers, distributor customers or business to business customers.

#### **Continuity Marketing Programs**

Given the growing concern for retaining customers as well as the emerging knowledge about customer retention economies, many companies have developed Continuity Marketing programs that are aimed at both retaining customers and increasing their loyalty. (*Bhattacharya, 1998, p.31-44; Payne 1995, p.32*). For customers in mass markets, these programs usually take the shape of membership and loyalty card programs in which the customers are rewarded for their loyalty



relations with the marketers. (*Raphael, 1995, p.34-37; Richards, 1995, p.1*). For distributor customers, continuity marketing programs take the form of continuous replenishment programs ranging from JIT inventory management programs to efficient consumer response initiatives that include electronic order processing and MRP (*Law & Ooten, 1993, p.63-74; Persutti, 1992, p.2-9*). In Business to Business markets, these may be in the form of preferred customer programs or special sourcing arrangements, including single sourcing, dual sourcing, network sourcing and JIT sourcing arrangements (*Hines, 1995, p.18-24*). The basic aim of continuity marketing programs is to retain customers and increase loyalty through special services that have the potential to increase mutual value as the partners learn about each other (*Postula & Little, 1992, p.7-14*).

### **One to One Marketing**

The one to one or individual marketing approach is grounded in account based marketing. Such programs are aimed at meeting and satisfying each customers need uniquely and individually (*Peppers & Rogers, 1995, p.98*). What was once a concept prevalent only in business to business marketing is now implemented in mass market and distributor customer contexts. In the mass market, the dissemination of individualised information on customers is now possible at low cost due to the rapid development in Information Technology and the availability of scalable data warehouses and data mining products. For distributor customers, these individual marketing programs take the form of customer business development.

### **Partnering Programs**

The third type of relationship marketing programs involve partnering relationships between customers and marketers to serve end user needs. In the mass markets two types of partnering programs are common : co-branding and affinity partnering. In the case of distributor customers partnering programs are implemented through logistics partnering and co-operative marketing efforts. In Business to Business customers, partnering programs involving co-design, co-development and co-marketing activities are not uncommon today (*Mitchell & Singh, 1996, p.169-195; Young, Gilbert & McIntyre, 1996, p.139-151*).

### **2.1.2 Management and Governance Process**

Once relationship marketing program is developed and rolled out, the program as well as the individual relationships within it must be managed and governed. For mass market customers, the degree to which there is symmetry or assymetry is the primary responsibility of whether the customer or the program sponsoring company will be managing the relationship varies with the size of the market. However, for programs directed at distributors and business partners, the management of relationship

requires the involvement of both the parties. The degree to which these governance responsibilities are shared or managed independently depends on the perception of norms of governance processes among relational partners given the nature of their relationship marketing program and the purpose of engaging in the relationship.

Whether relational partners undertake management & governance responsibilities independently or jointly, they must address several issues. These include decisions regarding role specifications, communication and common bonds, planning process, process alignment, employee motivation and monitoring procedures. Role specification relates to the determination of the roles of partners in fulfilling the relationship marketing tasks as well as the roles of specific individuals or teams in managing the relationships and related activities (*Heide, 1994, p.71-85*).

Communication with customer partners is another necessary process of relationship marketing. Although communication between firm and customer partners helps to foster relationship bonds, conscious efforts to create bonds will have a more sustaining impact on relationships. In Business to Business relationships, social bonds are created through interactions; whatever the chosen mode, the creation of value bonding, reputation bonding, and structural bonding is a useful way to institutionalise relationships with customers (*Sheth, 1994, p.4-7*).

Finally proper monitoring processes need to be in place to safeguard against failure and to manage conflicts in relationships. Such processes include periodic evaluations of goals and results; the initiation of changes in relationship structure; design or governance process if needed; and the creation of a system for discussing problems and resolving conflicts. Good monitoring procedures help to avoid partnership destabilisation and the creation of power asymmetries.

Overall the governance process helps in the maintenance, development and execution aspects of relationship marketing. It also helps to strengthen relationships. Relationship satisfaction for involved parties includes satisfaction with the governance process in addition to satisfaction with the results achieved in the relationship (*Parvatiyar, Biong, & Wathne, 1998, p.18-20*).

### **2.1.3 Relationship Marketing & Marketing Strategy**

Over the past three decades the study and practice of Business strategy – Marketing Strategy in particular – has experienced a number of dominant approaches. Some of these approaches have been so widely diffused and conceptually discontinuous from predecessors that they were labeled new “paradigms” by observers. Strategic planning, Portfolio approaches, Population ecology, and Business Process Re-

Engineering are all examples of these once dominant approaches to strategy. Although many of these and other approaches to strategy might best be thought of as fads and fashions, others that are no longer dominant continue to offer insights to scholars of strategy and useful guidance for practitioners of strategy. More recently, Relationship Marketing has emerged in the academic and trade literatures as a useful approach to “doing business”.

It has been argued that relationship marketing is not new (*Peterson, 1995, p.278-281*), as business people have long held and practiced business philosophies that promote treating and suppliers courteously and working to build corporate cultures that encourage high level of customer satisfaction through social interaction. However many scholars and observers of relationship marketing imply, if not express that relationship marketing can be more than a business philosophy, that it can go beyond a customer friendly corporate culture. It can be a part of the firm’s overall means of achieving its goals and objectives. In short relationship marketing can be a major part of firm’s business strategy.

#### **2.1.4 The Economic Content of Marketing’s Inter-organizational Relationship**

In market based transactions, participants focus exclusively on the economic benefits of the exchange. As a relationship becomes increasingly attractive economically for the relationship’s partners, it becomes prudent for them to co-operate, as the long term total costs of doing business are lower because of the relationship (*Weitz & Jap, 1995, p.305-320*). Further more, as a relationship moves from market based to episodically recurrent to relational – and hence is characterized as more co-operative – the economic benefits of continuing the relationship increase, as do the economic cost of terminating it. The importance of the economic content of the relationship has been illustrated in

- (a) total quality theory (*Kalwani & Narayandas, 1995, p.1-16*), emphasizing that firms must continually seek out products, processes, and technologies that add customer value to their own offerings and that collaboration is essential to this process.
- (b) the costs of co-operation where relationships characterized by trust and commitment inherently have lower collaboration costs (including monitoring costs) than those based solely on legal contracts (*Morgan & Hunt, 1994, p.20-38*)

(c) the related concepts of switching costs and customer retention, widely recognized as providing the firm with marketing efficiency – an economic benefit (*Sheth & Parvatiyar, 1995a, p.397-418*).

## **2.2 Concepts Of Industrial Marketing**

As industrial firms strive to develop and maintain profitable positions in the global market of the 21<sup>st</sup> century, the marketing strategy has moved center stage. For industrial marketers, marketing has become virtually synonymous with business strategy because of the critical importance of market segmentation, targeting and positioning to the competitive performance and financial success of the firm.

Industrial marketing management is a special case within marketing; also called Business to Business marketing, it is defined by the nature of the customer – a profit seeking or a budget constrained organization (Business, Institution, or Government) seeking help in achieving its goals through the purchase of goods and services. While the essential elements of marketing strategy and analysis remain the same for all products and services, industrial marketing is unique in its concern for long term strategic relationships with customers, the complexity of the buying process, and the mutual dependence that results. Often the ongoing development of technology is at the core of buyer seller relationship. Typically even standard products must be precisely tailored with a bundle of services for individual customers (*Webster, 1991, p.65-69*).

Industrial goods and services can be categorized in a variety of ways. A typical scheme involves construction, heavy equipment, light equipment, components, sub-assemblies, raw materials, processed materials and operation supplies and services.

### **2.2.1 Derived Demand**

Demand for Industrial goods and services are derived from the demand of the customers for their goods and services. It is probably more realistic to say that Industrial customer's purchases reflect their expectations about future demands for their goods and services. Clearly, purchasing decisions must be made in anticipation of the market conditions that the customer company expects to face. The customer's actual need for products, willingness to make commitments to potential suppliers, and ability to pay for these purchases are all a function of the customer's optimism or pessimism about the future.

Because demand for industrial products are derived demands, industrial marketers can sometimes stimulate demand for their products by stimulating demand for their customer's products.

It is therefore true that understanding the nature and scope of industrial markets requires understanding both the nature of demand facing the industrial customer and the customer's customer throughout the marketing channel to actual consumer demand. In addition, it is usually helpful to analyze competitions in the customer's industry and perhaps competition among customers in the market that customer serves. The need to analyze market activity at all levels between industrial customer and end users / consumers is the most significant implication of the fact of "derived" demand in industrial markets ( *Bolt, 1994, p.65-72*).

### **2.2.2 Industrial Marketing versus Consumer Marketing**

At the most general level there is a body of theory knowledge, and practice that cuts across all marketing – industrial and consumer products and services, business and non profit organizations, and so on. But to understand and intelligently attach industrial marketing problems, a number of substantial differences between industrial and consumer marketing must be recognized.

Charles Ames, (*Ames, B, C., 1970, p.93-102*) a management consultant observed that the four key dimensions in applying the marketing concept to Industrial Marketing were

- (a) Aiming for improved profit performance, with sales volumes and market share per se not as important as in consumer marketing.
- (b) Identifying customer needs, which require understanding the economics of the customer's operations, then structure of the industry within which they operate and how they compete.
- (c) Selecting customer groups for emphasis, the classic problem of market segmentation, which takes on special meaning in Industrial Marketing because of the high degree of buyer seller interdependence after the sale.
- (d) Designing the product / service package, where there is seldom a standard product itself, and the product must be invented.

Ames summarized these observations by noting that : Marketing in the Industrial world is much more a General Management responsibility than it is for consumer products. For in the consumer goods company, major changes in marketing strategy can be made and carried out within the marketing department through changes in advertisement emphasis or weight, promotion emphasis, package design and the like.

In an industrial company, on the other hand changes in marketing strategy are more likely to involve capital commitments for new equipments, shifts in development activities, or the departure from traditional Engineering and Manufacturing approaches, any one of which could have company wide implications. And while marketing may identify the need for such departures, General Management must make the decision on the course the company will take to respond to the market – and it must provide the follow through to ensure that this course is pursued in every functional area.

### **2.2.3 Functional Interdependence**

Industrial marketing effectiveness depends to a great degree on other business functions, especially, Manufacturing, Research & Development, Inventory Control, and Engineering; it has much closer relationship to overall corporate strategy and has a higher degree of functional interdependence.

In a very real sense Industrial marketing calls for and creates conditions leading toward a more complete application of the marketing concept than consumer marketing. By its very nature industrial marketing requires that all parts of the business be customer oriented and that all marketing decisions be based on a complete and accurate understanding of the customer needs. In fact it can be argued that a marketing oriented industrial company is often closer to its customer and more knowledgeable about their needs than in the typical marketing-oriented consumer company. (*Hill, Alexander & Cross, 1996, p.111-117*)

### **2.2.4 Product Complexity**

A major barrier to a true marketing orientation remains excessive Product, Engineering, Manufacturing and Technical orientation. The real risk in these cases is that “loving the product more than the customer”, becoming so enamored with a technical accomplishment or particular product parameters that the necessary flexibility for responding to customer needs in a competitive market place disappears. Therefore greater supplier flexibility is required, in contrast to consumer marketing.

Professor E. Raymond Corey (*Corey, E.R., 1983, p.69-74*) has addressed this problem by observing that in Industrial marketing strategy the product must always be regarded as variable, not as a given. It can be said that in Industrial Marketing the product is not a physical entity per se. Rather the product is an array of economic, technical, and personal relationships between buyer and seller. This points out to a high degree of interdependence between buyer and seller in Industrial Marketing.

### **2.2.5 Buying Process Complexity**

A fourth dimension of uniqueness of industrial marketing in contrast to consumer marketing is the greater complexity of the buying process. Complexity in the buying decision process reflects several factors : the influence of the formal organization itself; the large number of persons involved; complex technical and economical factors that must be considered; the environment in which the firm operates; and frequently the large sums of money involved in the transaction. The problem of relating buying response to marketing strategy is made more difficult than in consumer marketing by this complexity because of the characteristically longer time lags between the application of marketing effort and the resulting buyer response (*Anderson, C.A. & Narus, A.J., 1998, p.142-148*).

### **2.2.6 Pricing**

Although pricing is a critical variable in Individual marketing strategy, it cannot be analyzed independently of other strategic variables. The pricing analysis should start with a precise definition of marketing targets, the macro segmentation strategy. Market potential in these segments should be determined and the relationship between industry price levels and the level of demand in those segments carefully estimated. Then the analyst must develop the firm's product positioning in those segments and design a total product offering and marketing mix consistent with that positioning.

The next step should be estimation of all relevant costs, assuming certain levels of demand and production, including both production costs ( Fixed and Variable) and marketing costs. The competitive environment in each segment should be examined in detail, including not only sellers competition but also competition among the firms in the macro segment, trends influencing their business, their cost structures, and demand in the market they serve. Relevant legal and regulatory matters should also be assessed, especially as they relate directly to pricing and antitrust consideration. When all these considerations are analyzed, the marketer can set specific pricing objectives that will be consistent with overall marketing objectives in the segments as well as consistent with production and legal requirements. The importance of good market information, both from and to customers and competitors, cannot be overstated in the development of a sound pricing strategy (*Kotler, 2002, p.182-195*).

### **2.2.7 Promotion**

Promotion or rather Industrial marketing communication are a mix of personal and impersonal communications aimed at industrial buyer. They include personal selling, catalogues, product literature, advertising, direct mail, trade shows, publicity, public

relations and promotional novelties & gifts. The effect of these promotional tools is a function of its interaction with the others, although each has a distinct role to play in moving the potential customer from unawareness of the company and its products through several stages of the buying decision process to buying action. Industrial marketing communication strategies usually have personal selling as a principal component (V.Kasturi, Rowland and Gordan, 1992, p.72-82).

The effects of industrial marketing communication are synergistic ( i.e. the communication modes interact with one another and produce an effect that is more than a simple summation of the individual effects) and cumulative over a period of time. If a customer or prospect has a contact with a company's sales representative, then it is likely that impressions formed on the basis of these interactions will be the major determinant of the customer's view of the supplier firm. But if there is no such direct contact, then the customer's or prospect's perception of the firm will be based on a general image formed by a variety of the other sources of information including word of mouth, public relations, publicity and media advertising (*Raphel, M., 1995, p.34-37*).

## **2.3 Principles Of Strategic Management And Marketing Strategy**

In the present scenario, when the environment is changing rapidly, a firm simply cannot make decisions based on long standing rules, historical policies or simple extrapolations of current trends. Instead they must look to the future as they plan organization wide objectives, initiate strategy and set policies. The environment is becoming more and more complex and living with uncertainty is the Managements biggest challenge.

### **2.3.1 Strategy**

Strategy focuses on how to compete in an industry and how to achieve competitive advantage by formulating plans and initiating decisions. The more accurate the firm can scan the environment and predict the future for opportunities and threats, the better it can formulate its strategies to fulfill their mission and derive above average returns.

Strategic competitiveness is achieved when a firm successfully formulates and implements a value creating strategy. When a firm implements a value creating strategy that current and potential competitors are not simultaneously implementing and when other companies are unable to duplicate the benefits of its strategy, this



firm has achieved sustained competitive advantage. A firm is assured of sustained competitive advantage only after others' efforts to duplicate its strategy have ceased because they have failed (*Fred, 1997, p.47-55*).

A strategy is a unified, comprehensive and integrated plan that relates the strategic advantage of the firm to the challenges of the environment. It is designed to ensure that the basic objectives of the enterprise are achieved through proper execution by the organization.

A strategy is the means used to achieve the ends (i.e. objective). A strategy is a plan that is unified, comprehensive and integrated. It ties all major aspects of the enterprise together and all the parts of the plan are compatible to each other. A strategy begins with a concept of how to use the resources of the firm most effectively in a changing environment. It is a long term plan. It addresses fundamental questions such as: What is our business? What should it be? What are our products, functions and markets? What can be done to accomplish objectives? These issues help to understand the concept of strategy as a plan, which is the result of analyzing strengths and weaknesses of the firm and determining what the environment has to offer so that the firm can achieve its objectives. Business involves a great deal of risk taking and strategic management attempts to provide data so that reasonable and informed risks can be taken. (*Jauch & Gleuck, 1998, p.9-18*)

As per Michael Porter, the underlying principles of strategy are:

- A good strategy is concerned with the structural evolution of the industry and with the firm's position within the industry.
- Leading companies will be those that don't just optimize within an industry, but redefine their industry.

A good strategy makes the company different, giving the company an unique position involving delivery of a particular mix of value to an array of customers.

### **2.3.2 Marketing Strategy**

For a multi business company, there are three levels of strategy being pursued within its hierarchy – Corporate, Business and Functional strategy. “Marketing strategy” is basically a functional level strategy but encompasses all three levels. As a management philosophy, the marketing concept asserts that marketing – putting the customer first – is every manager's responsibility.

Marketing strategies must be designed in a manner consistent with, and in order to implement, business unit strategy, which answers the question “How do we want to compete?” Likewise business unit strategy must be consistent with and implement

corporate strategy, which answers the question “What business do we want to be in ?” and views the company’s distinct product / market commitments as an interacting portfolio of business. At the top of the strategic hierarchy is enterprise strategy, which defines the mission of the business in the society it serves and incorporates value judgments that must be made by management (*Gary and C.K.Prahalad, 2001, p.52-55*).

### **2.3.3 Internal Analysis**

Strategic planning begins with an appraisal of the firm’s strengths and weaknesses. All areas of the firm must be assessed, including organization, financial capabilities, technical competence, location, production skills, physical plant and equipment, management, workforce, the sales force, image, customers, customer loyalty, cost advantages, advertising and so on. Typically, competing firms provide a reference point, a basis for comparison, but a variety of criteria must be used in assessing strengths and weaknesses, including objective criteria.

Strategic planning is motivated by a desire to maximize exposure of the firm’s strengths, while minimizing the exposure of the weaknesses. But that does not mean that the weaknesses have to be accepted or that new strengths cannot be acquired. The central concern of strategic planning is to allocate the firm’s resources as effectively as possible. Clearly, one purpose of the analysis of strengths and weaknesses is to define areas in which the firm should commit resources that will improve its capabilities.

### **2.3.4 Environmental Analysis**

If the environment were static there would be no need for the strategy formulation process. The environment obviously changes continually, however, as do the firm’s capabilities. The purpose of environmental analysis is to identify and assess threats and opportunities as they are evolving in the market place. The company itself is a part of the changing environment, especially since it develops and refines its basic competence in interaction with its customer’s evolving needs.

Environmental analysis requires a constant flow of information from a potentially limitless array of sources. Among the most obvious sources of information are sales representatives, customers, distributors, trade associations, management associations, universities, trade journals and professional publications. In addition to this general analysis, there is usually a need for more detailed analysis and measurement, including forecasts. The accuracy of all forecasts used as the basis for planning should be checked periodically for the obvious reasons that actual

experience may diverge significantly, even if the original forecasts was reasonable. A variety of sophisticated techniques exists for sales forecasts (*Makridakis, S., Wheelwright, S.C., Mcgee, V.E., 1983, p.138-149*). The marketing strategist need not be an expert in the use of these techniques, but he should know the basic assumptions, strengths and weaknesses of each, especially those that are being used by the staff people who provide the forecasts and the reports.

### **2.3.5 Impact of Market share**

Studies by the “Strategic Planning Institute” in Boston have confirmed the importance of market share as a factor influencing the profitability of a business. Their studies are called PIMS project (Profit Impact on Marketing Strategy). Using statistical techniques of regression analysis, the PIMS project analyzed 37 variables that might be expected to have some influence on business profitability. One of the strongest conclusion of their research was that there was a strong relationship between market share and profitability, as measured by Return on Investment (ROI). (*Buzell, R.D., Gale, B.T. and Sultan, G.M., 1975, p.97-106*).

Subsequently, the Strategic Planning Institute put another conclusion first among the PIMS principles – “In the long run, the most important single factor affecting a business unit’s performance is the quality of its products and services, relative to those of competitors.” (*Buzell, R.D. and Gale, B.T., 1987, p.7*). Nonetheless the PIMS studies support a general conclusion that an increase of 10% points in market share is associated with about 3.5% point increase in ROI (*Webster, F.E., Jr., 1991, p 241*). Such a crude generalization must be viewed with extreme caution as the circumstances under which the relationship exists undoubtedly vary significantly from business to business.

These results serve to make a thoughtful manager cautious in applying critically the simple notion that increases in market share will bring increases in profitability. Market share is probably best seen not as an objective, but as a reward, as a measure of how well the firm has developed superior value to customers, which is also how profit is seen under the marketing concept.

## **2.4 Turnkey Project Marketing**

In the present scenario, when the environment is changing rapidly, a firm simply cannot make decisions based on long standing rules, historical policies or simple extrapolations of current trends. Instead they must look to the future as they plan organization wide objectives, initiate strategy and set policies. The environment is

becoming more and more complex and living with uncertainty is the managements biggest challenge. The trend world wide is to procure electric distribution network and substations on a turnkey basis, rather than than procure loose equipment and set up the substations themselves. To survive in the fierce competition of providing turnkey solutions for electric power distribution, that a marketer finds himself in, he has to adopt different strategies : he tries to be different from the rest by offering services no one else can; by trying to be lowest priced, etc. But these strategies are not practical for most as only few companies have the economy of scale or scope to be price leaders. The key to winning is to focus on the one thing the competitors can never beat or duplicate – creating irresistible customer relationships; strong relationships are one’s one and only source of sustainable advantage.

The electric distribution substation is an industrial product with high level of functional interdependence, product complexities and buying process complexities, wherein pricing, promotions and relationships are going to be the key success factors.

An important step towards deciding on the marketing strategies for electric distribution substations on turnkey basis, by electrical equipment manufacturers, would be the internal analysis, environmental analysis and impact of entering new markets of turnkey substations, on the overall market shares of the equipment manufacturers.

## **Chapter 3 – Electric Power Sector Scenario**

### **3.1 Introduction**

After electricity was first introduced in the 1880s in the United States and Europe, its use expanded dramatically throughout the world, transforming almost every aspect of daily life. It is now essential to the operation of most modern technological systems, and, for this reason, has attained the status of a 'metatechnology'. The inner logic of this metatechnology has shaped contemporary development patterns – grid expansion and urbanization are nearly synonymous; national and local politics – pro-growth and pro-electrification coalitions significantly overlap; social values, culture and identity – to be modern is to be electrified; and community life – our connection to one another (in industrial countries especially is often electrical (telephone, television, e-mail). It is not surprising therefore, that electricity supply is often viewed as an essential public good in contemporary society. The electricity systems developed over the last century mainly rely on large-scale power plants and extensive networks of transmission and distribution that deliver electricity at affordable prices (at least, in most industrial countries). However, these systems have also created a host of environmental, social, and economic problems (*Dubash, 2002, p.13-19*).

### **3.2 Anatomy Of Power Liberalisation**

#### **3.2.1 Historical Context**

For nearly a century, electricity around the world was typically produced by vertically integrated utilities, which operated facilities for all three stages of electricity service: generation, transmission, and distribution. In many cases, utilities were state-owned monopolies. When private ownership was present, the companies nonetheless operated as monopolies in designated franchise areas regulated by governments that set rates and oversaw investments (*Patterson, 1999, p.35-38*). The involvement of the public sector in the electricity industry is partly explained by the sector's technical and economic evolution. As utilities pursued economies of scale both in supply and in demand, electricity systems became highly centralised, large-scale technological networks (*Graham, 2000, p.72-74*). Creating such a network is a highly capital-intensive project with long payback periods (but significant society-wide benefits), and, as a result, has required public sector oversight of electricity supply in many countries. Even where private firms were active from the outset in the electricity business (e.g., the USA, Germany, and Japan), governments have played an

important role in building electric networks – sometimes as a supporter of, and at other times as a competitor to, private power (*Patterson, 1999, p.35-38*).

A series of proposals during the late 20th century sought to address issues of power shortages, as well as capital shortages suffered by developing country public sectors. Power liberalisation has differed by country, but common elements of an agenda for sectoral change can be identified (*IEA 2001; Littlechild, 2001; Rosen, Sverrison & Stutz, 2000*):

- Vertically integrated utilities are broken up, either by sale of generating plants, or by placing generation assets in separate unregulated generating companies that remain utility subsidiaries.
- Markets are created into which the generating companies can sell, and from which others can buy.
- Capital investment in the sector is increasingly decided by market actors and forces.

Reforms in the institutional framework of the electricity industry that are associated with power liberalisation are justified by advocates on several grounds. It is argued by many that the merits of monopoly in electricity generation have disappeared because economies of scale associated with centralised power plants have been exhausted (*Joskow 1998, p.25-52; Flavin & Lessen 1994, p.87-93*). Continued monopoly supply under these circumstances would only hinder the introduction of new technologies (*Hirsh & Serchuk 2000*). Others point to the fact that governments in many countries are experiencing financial strain in mobilising capital for investments in electricity infrastructure (*Tellam, 2000, p.63-66*). Where state ownership is not prevalent, state interventions in electricity price-setting and capacity planning are blamed for 'distorting' markets, thus creating artificially low prices (in developing countries) or high prices (industrial countries). In both cases, sub-optimal conditions for electricity supply and demand are possibly created (*IEA 1999a; IEA 1999b*). Additionally, some suggest that pressures are escalating from increasingly globalised capital sectors for the electricity industry to be more open to new investments, competition, and capital mobility (*Flowers 1998, p.41-45*).

### **3.2.2 Efficiency ideology**

An almost universal justification for electricity privatisation and/or the introduction of competition has been the claim that reform will yield an economically more efficient sector than regulated monopoly arrangements. The International Energy Agency (IEA), for example, argues that electricity market competition offers significant potential benefits through improved economic performance, lower prices, and an

expansion of choices available to consumers (*IEA 1999a and 1999b*). Following the same line of argument, other multilateral institutions such as the World Bank, the International Monetary Fund, and the Asian Development Bank (ADB) also are calling for power sector reform as a key condition for loans and other forms of financial support ( *Dubash 2002, p.51-54*). In this regard, power liberalisation is increasingly expressed in the form of an ideology, that is, a belief (with cited empirical support) in the ability for specific institutional changes to create societal improvement, in this case, via advances in efficiency. Key beliefs underlying this ideology include:

- the view that the private sector is more efficient than the public sector in matters involving resource allocation (*Lovei & Gentry, 2002, p.77-81*);
- the assumption that greater competition and less regulation will increase economic efficiency (*Bacon & Besant-Jones, 2000, p.47-50*);
- the conviction that market-oriented policies will enable the electricity system to be subject to democratic pressures through the choices that consumers make (*Smeloff & Asmus, 1997, p.117-124*); and
- the presumption that liberalisation will enhance environmental quality by driving out old technologies (*Lovins et al, 2002, p.83-86; Joskow, 1998, p.25-52*) and/or by facilitating 'green' consumerism (*Flavin & Lessen, 1994, p.24-28*).

### **3.2.3 The agenda of Power Liberalisation**

Power liberalisation aims to free electricity from the constraints of public control by permitting it to be auctioned largely as a commodity. As Offner (2000) points out, the policy emphasises private markets and ability to pay, and regards public support and crosssubsidies as sources of social and economic distortion. In other words, power liberalisation is centered on an agenda of commodification 'in which progress is determined by increased social capacity to produce and purchase goods and services' (*Byrne & Rich, 1992, p. 271*).

As explained below, commodification of electricity supply advances trends toward centralisation and marketisation in not only the techno-economic but also socio-political contexts that give structure to the sector.

#### **3.2.3.1 Increasing Centralisation**

In discussing the origin of electricity restructuring, many note that recent technology innovation in electricity generation has made obsolete the logic of scale economies, which had earlier justified monopoly status for suppliers (*Fox-Penner, 1997, p.162-168*). Improvements in smaller-scale, natural gas-fired, combustion technology have

arguably diminished the economic edge that large plants once had. As a result, advocates believe that a key hurdle to supply side competition, namely, high initial capital costs to enter the market, is no longer present (*Fox-Penner, 1997, p.162-168 ;Brennan et al, 2002, p.185-188* ). In fact, power plants built by independent power producers in the USA, which typically account for over 50% of new capacity additions, averaged just 25 MW by 1992. Similarly, the average size of utility-built plants declined from more than 600 MW in the mid 1980s to an average of about 100 MW by 1992 (*Flavin and Lenssen, 1994, p.17*). This trend is seen as a decisive factor in explaining the rapid increase in restructuring efforts during the 1990s.

While it is true that smaller-scale gas turbines have played a role in challenging the 'natural' monopoly economics in generation, this does not necessarily mean that power liberalisation will lead to decentralized electricity systems, in which small-scale, community-based technologies flourish, and management of the electricity systems becomes localised. To the contrary, centralisation is being further reinforced especially in the form of utility mergers and acquisitions, and in the operation of transmission and distribution (T&D) networks. For example, since wholesale competition was established in 1992, the number of private utilities in the USA has shrunk dramatically because of increasing merger and acquisition activity. As a result, while the ten largest utilities in the USA, ranked according to generation capacity, owned 36% of all investor-owned-utility generation capacity in 1992, the share had increased to 51% by 2000. Evidence of consolidation among the sector's top 20 companies is even more compelling. In 1992, the 20 largest companies owned 58% of total investor-owned-utility generation capacity; their share had increased to approximately 72% by 2000. British experience likewise suggests that centralisation of the electricity business is likely, notwithstanding advances in small-scale generation technology. While the U.K originally had 12 retail supply companies operating in its competitive movement, six large generation companies now dominate. The 12 distribution companies created under the country's restructuring plan are also beginning to merge. As of 2002, eight firms own most of the distribution business (*Thomas, 2002, p. 5-11*).

For developing countries, a relatively modest number of overseas companies have competed to enter their electricity markets. For example, Cameroon received just foreign six bids when its market opened and Mauritania and Senegal each attracted only four foreign bidders in their liberalisation processes. Final participants were even smaller in number (one or two). According to a recent World Bank survey, moreover, most private investors are losing interest in developing country power markets (*Lamech and Saeed, 2002, p.21*). This is hardly convincing evidence that liberalization and technology change are promoting competition in the electricity



sectors of developing countries. Power liberalisation initiatives put great emphasis on the role of transmission networks as 'common carriers' and try to ensure 'open access' to the transmission network by competitors. Transmission operators also typically manage the bidding markets for the supply of electricity when competition in generation is introduced. While the language may resemble that of a 'commons' argument, the actual implications are quite different: the transmission system is operated as a 'common' carrier of electrons generated by large electricity companies, and 'open' access to the transmission system is guaranteed mostly to those companies and large-scale electricity consumers. Rather than being used as a means to reflect economic, social and environmental priorities of diverse communities connected to the electric grid, T&D networks are operated mostly as highly sophisticated technocratic institutions that enable the transfer of large volumes of electrons (and private gains) among a small number of sizable companies. Compared to the Internet, for example, there are only a modest number of participants, and their market power is substantial. Centralisation of the generation business and T&D networks has to do with the commodification of electricity spurred by liberalisation. A key action of reform in this respect is the lifting of restrictions on electricity trade. A 'free' market for electricity calls for competition in so-called bulk power supply (i.e., the delivery of large volumes of electricity to large, interconnected grids). Winning a bid in this market (at regional, national and international geographies) ensures a company that it can operate its plants at high capacity factors, thereby driving down unit costs. Merger and acquisition activities reflect this logic. Thus, even if smaller scale generation is now affordable, the generation business is likely to increase in scale. Similarly, an 'open' market depends on freer movement of electrons, which in turn requires increased interconnections between existing systems over wider geographies. Indeed, the extension and interconnection of transmission lines to facilitate the free movement of electric commodities is commonly presented as a key requirement for a more efficient electricity sector. The phenomenon is also readily observed in Europe, where the prospect of a multinational grid is being vigorously pushed. Another important element of the further centralisation of the electricity system is the concentration in ownership of electricity systems on a regional and global scale. As discussed by *Thomas (2002, p.5-11)*, *Flowers (1998, p.41-45)* and *Patterson (1999, p.35-38)*, for example, mergers and acquisitions across national borders are a distinct feature of power liberalisation. In fact, opening the electricity industry to global capital is one of the key imperatives of power liberalisation, since its proponents believe that competition among electricity suppliers and carriers will generate the most efficient and optimal outcomes. Thus, liberalisation is likely to expand the geographical reach of the already large electricity suppliers, which will be justified under the guiding logic of commodification as the necessary result of the market's drive for efficiency.

### **3.2.3.2 Marketisation Agenda**

Faith in the marketplace constitutes another keystone of the policy framework underlying power liberalisation. Based on neo-liberal ideology that associates markets with freedom and governments with repression (Somers, 2001, p.23-48), free market advocates elevate trade as the centerpiece of civil society, and assign secondary status to non-market values and interests. In fact, some proponents regard markets and consumerism as preferable alternatives to political activism and the aggressive exercise of citizenship because, arguably, society's members can participate in markets directly and individually, whereas citizens participate in the polity only indirectly and collectively (Crouch, et al, 2001, p.1-20). Such a tendency to 'marketise' or 'privatise' citizenship (Somers, 2001, p.23-48) is noticeable in the debate over power liberalisation. In line with the 'Citizens' charter' formulated by the British government to celebrate individual choice (Freedland, 2001, p.100), providing individual consumers with 'the right to choose' electricity suppliers is often described as equivalent to securing civil rights and 'democratising' the electricity system. The advocates of this view argue that citizens, who hitherto had little influence in decision-making on electricity policy, can now realise their preferences and values in the electricity market using their power to choose and change electricity suppliers (Smeloff and Asmus, 1997, p.154-157). Based on the belief that market mechanisms are more efficient than social regulation or planning, proponents of electricity restructuring also argue that important public policy goals such as the promotion of renewable energy can be realised by expanding consumer choice (Swezey & Bird, 2000, p.17-19).

## **3.3 Power Sector Scenario In India**

The power sector has registered significant progress since the process of planned development of the economy began in 1950. Hydro -power and coal based thermal power have been the main sources of generating electricity. Nuclear power development is at slower pace, which was introduced, in late sixties. The concept of operating power systems on a regional basis crossing the political boundaries of states was introduced in the early sixties. In spite of the overall development that has taken place, the power supply industry has been under constant pressure to bridge the gap between supply and demand.

### **3.3.1 Growth of Indian Power Sector**

In December 1950 about 63% of the installed capacity in the Utilities was in the private sector and about 37% was in the public sector. The Industrial Policy Resolution of 1956 envisaged the generation, transmission and distribution of power

almost exclusively in the public sector. As a result of this Resolution and facilitated by the Electricity (Supply) Act, 1948, the electricity industry developed rapidly in the State Sector (*IEEMA journal, June 2003, p.31-32*).

In the Constitution of India "Electricity" is a subject that falls within the concurrent jurisdiction of the Centre and the States. The **Electricity (Supply) Act, 1948**, provides an elaborate institutional frame work and financing norms of the performance of the electricity industry in the country. The Act envisaged creation of **State Electricity Boards (SEBs)** for planning and implementing the power development programmes in their respective States. The Act also provided for creation of central generation companies for setting up and operating generating facilities in the Central Sector. The **Central Electricity Authority** constituted under the Act is responsible for power planning at the national level. In addition the Electricity (Supply) Act also allowed from the beginning the private licensees to distribute and/or generate electricity in the specified areas designated by the concerned State Government/SEB (*TERI Newswire, November 2003, p.18*).

During the post independence period, the various Indian states played a predominant role in the power development. Most of the Indian states have established State Electricity Boards (SEBs). In some of these states separate corporations have also been established to install and operate generation facilities. In the rest of the smaller Indian States the power systems are managed and operated by the respective electricity departments. In a few states private licencees are also operating in certain urban areas.

Power sector has mainly been the state subject in the Indian governance system. There has always been a special emphasis in increasing the power generation in the country to provide cheap uninterrupted power supply for the growth of industries and household. It is envisaged that a total capacity addition of almost 140,000MW will take place during 1997-2012. As generating capacity is increased to meet demand, the strain on existing power transmission network will become unbearable, without correspondingly huge investments in Transmission assets. Against the prescribed ratio for investments in Generation, Transmission and Distribution (T & D), investments in T&D in India have been limited to 33% as compared to the total investments in the power sector during the past plan periods. The expenditure during 1997 – 2002, on Transmission and Distribution in comparison has been 58% in US, 65 % in France and 60% in Germany, of the total expenditure on Power Sector (*TERI Newswire, March 2004, p.24-28*).

The efforts undertaken in increasing the production are not yielding the desired results mainly because the transmission system is unable to take the load of transferring the power from one place to another and thus is leading towards high T&D losses. As per the latest estimates, the T&D losses are as high as 40 to 50%. Thus, special efforts have been undertaken to improve the Power transmission and distribution capacity in the 10<sup>th</sup> (2002 – 2007) and the 11<sup>th</sup> five-year plan (2007 – 2012) (*Govt. of India report of the expert group on restructuring of SEBs, July 2002*).

### 3.3.2 Generation Mix

The share of hydro generation in the total generating capacity of the country has declined from 34 per cent at the end of the Sixth Plan to 29 per cent at the end of the Seventh Plan and further to 25 per cent at the end of ninth Plan. The share is likely to decline even further unless suitable corrective measures are initiated immediately.

Table 3.1 : Generation mix in India

Source	Central	State	Private	Total	% share of total
Coal	21417.51	36302	4414.38	62130.89	59.22
Gas	4419.00	2661.70	4082.40	11163.10	10.64
Diesel	0	582.89	551.94	1134.80	1.08
Total Thermal	25836.51	39546.59	9045.72	74428.82	70.94
Hydro	3049.00	22636.0	576.20	26261.22	25.03
Nuclear	2720.00	0	0	2720.00	2.59
Wind	0	62.86	1444.60	1507.46	1.44
Total	31605.51	62245.47	11066.52	104917.5	100.00

Source : Ministry of Power, Govt. of India, Report on major initiatives for Power Sector Development, May 2002.

As on March 2002, the total installed capacity of utilities stood at 104,918 MW. Most of this installed capacity is under government control. The state governments control nearly 60% of the power generating capacity. Currently, the central government owns about 30% of the power generating capacity in the country, the majority of which is in the thermal sector. Of the total installed thermal capacity of 25366.50 MW in Central sector, NTPC's share is 20092 MW (76.61%) (*Gol Report, May 2002*).

### **3.4 Power Sector Reforms Around The World**

Since the mid 1990's, countries around the world have begun to embark on radical power sector reform with a view to increasing efficiency and thus reducing prices. Reforms that have been undertaken typically involve industry restructuring to separate potentially competitive activities (generation and supply) from natural monopolies (transmission and distribution), setting up of an independent regulator, privatisation, and market liberalisation (see, for example the EBRD Transition Report 1996). England and Wales pioneered power sector reform starting in 1993, where privatisation and liberalisation has resulted in substantial efficiency gains and price reductions ( *Newbery and Pollit, 1997*). Following this positive experience, the European Union Power Directive was introduced to provide a framework for liberalisation in member countries; this has now largely been implemented. Industry liberalisation recently took place in the United States, though the full benefits of reform here are yet to ensue (see 3..4.1). Power markets have also been set up in Scandanavia, Australia and New Zealand, Latin America, Asia and Africa ([URL:http://www.safir.teri.res.in/wkshp/7-8aug2001/dk.pdf](http://www.safir.teri.res.in/wkshp/7-8aug2001/dk.pdf)), 5.7.2004.

#### **3.4.1 The American Experience**

In the pre-reform electricity sector,  $\frac{3}{4}$  of the state's consumption was supplied by three large vertically privately owned utilities regulated under a traditional US style cost of service regulatory system. Under the reform, the integrated utilities sold off their generating capacity. Tariffs were frozen at 90% of their pre restructuring level. A spot market was set up together with a grid company. It was envisaged that competition would drive down the power price sufficiently that under the capped tariffs power companies would make sufficient profits to offset any stranded costs. During the first two years (1996-8) the wholesale markets worked reasonably well (wholesale prices fell), but as a consequence of a substantial increase in the demand, accompanied by reduced availability of hydropower and big increases in the price of gas and pollution permits, wholesale prices increased in 1999 and skyrocketed in 2000. In light of the tariff freeze, and without any hedging through forward contracts, this left the two largest companies on the verge of bankruptcy. Resulting payment difficulties exacerbated the problem, with generators unwilling to supply power and hence frequent blackouts ([URL:http://www.safir.teri.res.in/wkshp/7-8Aug2001/dk.pdf](http://www.safir.teri.res.in/wkshp/7-8Aug2001/dk.pdf)), 5.7.2004.

#### **3.4.2 The Kazakhstan Experience**

Radical power sector reform began in Kazakhstan in 1996, when the industry was partially unbundled and some assets were privatized. The national electricity

transmission network is owned and operated by state-owned Kazakhstan Energy Grid Operating Company (KEGOC). Power generation assets have largely been separated from transmission facilities and privatized. Only five of the regional distribution companies had been privatized as of mid 2001, with the majority remaining in state ownership and under the management of KEGOC. In Almaty (the largest city and former capital) power and heat assets were privatized in 1996 to a subsidiary of the Belgian power company Tractebel. The privatization deal involved a twenty five year concession over the Almaty power and heat distribution networks, and five heat and power plants, purchased for \$7 million. At a later stage, Tractebel was awarded a fifteen year concession on gas transmission for a price of \$30 million. Tractebel believed it had contractual commitments over tariff increases which were not honored and began legal proceedings against the Government of Kazakhstan early in 2000. In April 2000, a deal was reached under which Tractebel left the country with compensation of \$100 million, and privatized assets reverted to public ownership.

In Karaganda (Kazakhstan's second largest city) power generation and distribution facilities are controlled by a holding company owned by Great Britain's National Power together with a subsidiary of the Israeli company Ormat. In the Altai (northeastern Kazakhstan) region, which encompasses approximately one-quarter of all land in Kazakhstan, virtually all power generation facilities are owned (or managed under long-term concessions) by subsidiaries of AES Corporation, and some power distribution facilities in the region are managed by AES. Both Ormat and AES continue to experience problems gaining approval for tariffs sufficient to cover investment cost.

Difficulties encountered by private investors in the sector stem from the regulatory framework. Though the regulator is separate from any government department, it is not independent from the political process; the regulator is subject to politically imposed budget constraints, is frequently replaced during a government reshuffle, and is reluctant to approve tariff increases on the grounds that they may be politically unpopular. Regulatory rules support political interference in the tariff setting process. For example, the tariff formula allows an unspecified (in the legislation) margin rather than a rate of return on capital; in practice the margin is squeezed to prevent tariff increases. Regarding commercial losses, these can be substantial in Kazakhstan, but are assumed by the regulator to be zero, thus the regulated company does not realise the full amount of its allowed revenue and cannot therefore cover its cost. Despite difficulties, the private sector has been successful in improving payments performance. In Almaty, Tractebel was successful in pursuing high profile debtors and achieved a substantial increases in both cash and revenue collection. As Tractebel left the country, collections quickly declined by 30%. In Karaganda, prior to

privatisation (in 1997) collections were 20%, rising to 93% (either cash or offsets for fuel inputs and taxes but not other forms of barter) in May 2001. Whether the present private sector participants choose to remain in the country will probably depend on the extent of regulatory reform to be undertaken (*URL: <http://www.safir.teri.res.in/wkshp/7-8aug2001/dk.pdf>*), 5.7.04.

### **3.4.3 Power Sector Reforms In Developing Economies**

In the case of developing economies, it is likely that power sector reform would result in substantial efficiency gains, more so than have been witnessed in other countries which started out with part commercialized power sectors, both through changing incentives – breaking the cycle of vested interests that ensued from the socialist era - and introducing new commercial know how. Whereas generally reforms would be expected to result in price reductions, in the case of developing economies, where prices are below the level of long run costs, reforms should limit the price increases necessary to sustain a good quality power supply.

In defining a reform path for power sectors in developing economies, the standard model of unbundling, privatizing must be refined to account for the transition context. Of particular importance in developing economy power sector reform are issues relating to sequencing and institutional capacity. The starting point for reform is the heritage of monolithic state owned companies, run as part of government ministries along engineering rather commercial lines. The first step forward is to distance power sector management from political interference through corporatisation of the state owned power company . Having corporatised the power company, the next standard reform step (both in and outside developing countries) has been to vertically unbundle it into generation, transmission and distribution / supply components with separate accounts, possibly as subsidiaries within a holding company structure, or as separate legal entities.

Whereas in general the next step might be to privatize generation, transmission and distribution simultaneously, in developing economies there is often a strong case for privatizing distribution first, namely when payments discipline is a problem. At the theoretical level, privatization of power distribution would be expected to result in increased payments collection through strengthened incentives associated with profit maximization. Furthermore, the private sector has the know how and the finance required (for re-metering programmes, computerization of billing, etc.) to improve payments performance.

Privatization of generation is not a solution to the problem of payments collection because there is typically limited (if any) interaction between generators and

consumers. Privatization of generation without improving collection could well fail due to lack of investor interest. Alternatively, privatization revenues would be low, and post privatization investment finance would likely not be forthcoming. In each of these scenarios, there would likely be political resistance, with the possibility of reputational damage to the government and its reform effort both in the sector and more generally. In countries where payments discipline is not a problem, there is not reason to proceed with privatization of distribution first; this was the case in Hungary, where generation and distribution were privatized simultaneously. (*Bacon & Besant, 2001, p.56-58*)

### **3.5 Electric Power Sector Reforms In India Till Date**

#### **3.5.1 The Policy of Liberalisation**

The Government of India announced in 1991 and consequent amendments in Electricity (Supply) Act have opened new vistas to involve private efforts and investments in electricity industry. Considerable emphasis has been placed on attracting private investment and the major policy changes have been announced by the Government in this regard which are enumerated below:

- The Electricity (Supply) Act, 1948 was amended in 1991 to provide for creation of **private generating companies** for setting up power generating facilities and selling the power in bulk to the grid or other persons.
- Financial Environment for private sector units modified to allow liberal capital structuring and an attractive return on investment. Up to **hundred percent (100%) foreign equity** participation can be permitted for projects set up by foreign private investors in the Indian Electricity Sector.
- Administrative & Legal environment modified to simplify the procedures for clearances of the projects.
- Policy guidelines for private sector participation in the **renovation & modernisation** of power plants issued in 1995.
- In 1995, the policy for **Mega power projects** of capacity 1000 MW or more and supplying power to more than one state introduced. The Mega projects to be set up in the regions having coal and hydel potential or in the coastal regions based on imported fuel.
- GOI has promulgated **Electricity Regulatory Commission Act, 1998** for setting up of Independent Regulatory bodies both at the Central level and at the State level viz. The **Central Electricity Regulatory Commission (CERC)** and the **State Electricity Regulatory Commission (SERCs)** at the Central and the State levels respectively.



- The **Electricity Laws (Amendment) Act, 1998** passed with a view to make transmission as a separate activity for inviting greater participation in investment from public and private sectors.
- The Electricity Laws (Amendment) Act, 1998 provides for creation of Central and State Transmission utilities. The function of the **Central Transmission Utility** shall be to undertake transmission of energy through inter-state transmission system and discharge all functions of planning and coordination relating to inter-state transmission system with State Transmission Utilities, Central Government, State Governments, generating companies etc. Power Grid Corporation of India Limited will be Central Transmission Utility. The function of the **State Transmission Utility** shall be to undertake transmission of energy through intra-state transmission system and discharge all functions of planning and coordination relating to intra-state transmission system with Central Transmission Utility, State Governments, generating companies etc.

*(Ministry of Power, Govt. of India report on Major Initiatives for Power Sector Development, 2002)*

### **3.5.2 Private sector**

The initial response of the domestic and foreign investors to the policy of private participation in power sector has been extremely encouraging. However, many projects have encountered unforeseen delays. There have been delays relating to finalization of power purchase agreements, guarantees and counter-guarantees, environmental clearances, matching transmission networks and legally enforceable contracts for fuel supplies. The shortfall in the private sector was due to the emergence of a number of constraints, which were not anticipated at the time the policy was formulated. The most important is that lenders are not willing to finance large independent power projects, selling power to a monopoly buyer such as SEB, which is not financially sound because of the payment risk involved if SEBs do not pay for electricity generated by the IPP. Uncertainties about fuel supply arrangements and the difficulty in negotiating arrangements with public sector fuel suppliers, which concern penalties for non-performance, is another area of potential difficulty. It is important to resolve these difficulties and evolve a framework of policy which can ensure a reasonable distribution of risks which make power sector projects financially attractive (*Planning Commission, Govt. of India, 2003*).

### **3.5.3 Implications of the reform process in India:**

The reform process has already started showing the results and these have been summarized (*Govt. of India report of the expert group on restructuring of SEBs, July 2002*) as below:

1. The unbundlings of the SEBs into the companies have started. The SEBs like APSEB, Orissa SEB, DVB and HSEB etc has already been bifurcated / trifurcated into the different companies. The private participation in some states like Orissa has also started.
2. Funds have started flowing in the form of WORLD BANK / ADB loans. The facility has been availed by many states.
3. The Government has introduced the new electricity bill that is clearer on the rules and regulations and the rights of the consumer.
4. The demand and the investments in the distribution business have increased and the states are spending money to improve the distribution capacity and reduction of the losses.
5. The power theft is being brought under check and control and especially in the areas where private players are managing the circles.

#### **3.5.4 Major T&D Policy Initiatives**

Following major policy initiatives have been taken by Government of India to accelerate the pace to develop Transmission & Distribution system in consonance with Generation system (*Ministry of Power, Govt. of India report on Major Initiatives for Power Sector Development, 2002*). Adequate emphasis is being given to establish strong Inter-regional links, reduction of T&D losses, load dispatch and communication facilities so as to facilitate emergence of truly national grid by end of 11<sup>th</sup> plan (2007 – 2012).

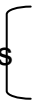
1. Under the power transmission policy being formulated by the Power Ministry, the private sector will be allowed to Build, Own and Maintain (BOM) the power transmission lines while the operations will be undertaken by Power Grid Corporation of India Ltd (PGCIL) or state undertaking that is in line with the provision outline under the power transmission bill, which was cleared by Parliament in 1998.
2. High voltage power transmission sector has been granted infrastructure status.
3. Central Electricity Regulatory Committee (CERC) shall take over from CEA as nodal power authority. This will imply that CEA will no longer fix power tariff for generation and transmission companies.
4. State government to privatize distribution in the cities having population of more than 1 million and also to constitute a regulatory commission to fix tariff as envisaged in the Central Electricity Act.
5. Revised mega power project policy has been announced which aims at adding 20000 mw of additional generation capacity.

6. The government has notified deemed company status to the state Electricity Boards. This is a part of the package the government has credited in union budget 1999 while segregating Transmission, Distribution and Generation.

### **3.6 Competition And Its Profile**

The most important factor for a company entering into any field is to understand the business environment as well as the competitive environment prevailing in the segment. The competitors need to know each other well to make strategies and counter strategies to gain more revenue and profitability. As the title of the report suggests there has been an attempt to identify if in the changing business scenario the equipment manufacturers can take up to the challenge of being the turnkey solution providers also.

Thus the competition has been divided into two segments:

- ❖ Equipment Manufacturers 
  - Domestic
  - MNCs
- ❖ EPC contractors

#### **3.6.1 Equipment Manufacturers**

The Equipment manufacturers are listed in the form of the products they manufacture mainly in the following categories of

- ❖ Distribution Transformers
- ❖ Switchgears
- ❖ Multi-product companies

#### **Distribution Transformer Manufacturers in India including National Companies and MNC subsidiaries .**

1. Andrew Yule, India
2. Electric Manufacturing Company (EMCO), India
3. Electric Control Equipment, India
4. APEX, India
5. Bharat Bilee, India
6. Kanohar Transformers, India
7. ALSTOM, India. (Subsidiary of MNC, ALSTOM, France)
8. Crompton Greaves Limited (CGL), India
9. Asea Brown Boveri (ABB), India (Subsidiary of MNC, ABB, Sweden)

**Switchgear Manufacturers including National Companies and MNC subsidiaries.**

1. Asea Brown Boveri (ABB), India (Subsidiary of MNC, ABB, Sweden)
2. ALSTOM, India. (Subsidiary of MNC, ALSTOM, France)
3. Bharat Heavy Electricals Limited (BHEL), Govt. of India Enterprise
4. Crompton Greaves Limited (CGL), India
5. Siemens India, (Subsidiary of MNC, Siemens, Germany)
6. Jyoti Ltd., India
7. Bienco Lawrie, India
8. Andrew Yule & Co. Ltd., Govt. of India Enterprise
9. Mysore Electrical Industries (MEI), India

**Multi Product Companies including National Companies and MNC subsidiaries.**

1. Asea Brown Boveri (ABB), India (Subsidiary of MNC, ABB, Sweden)
2. ALSTOM, India. (Subsidiary of MNC, ALSTOM, France)
3. Bharat Heavy Electricals Limited (BHEL), Govt. of India Enterprise
4. Crompton Greaves Limited (CGL), India
5. Siemens India, (Subsidiary of MNC, Siemens, Germany)

On closer analysis of the competitors, it is found that besides the multi product companies others are financially not sound and have limited working capital. These competitors are operating on regional basis and mainly operate on very low margins, as the overheads are quite less. They lack design and development facilities as compared to the multi product companies. This analysis was based on the industry feedback collected from various sources in the industry, market intelligence of BHEL, and the reviews in the Power line and IEEMA magazines (*Powerline, July 2003; IEEMA journal, June 2003*).

**3.6.2 EPC Contractors**

The EPC contractors are those business houses, which offer total services to the customer and take turnkey contracts. Their scope involves design, erection and commissioning of the total substation for the customer. They do not manufacture any product and generally source it from the equipment manufacturers. The major players in this arena in India are:

1. Bombay Suburban Electric Supply (BSES), India
2. Tata Power, India
3. Telmos, India
4. Subash Projects, India
5. Techno-Electric, India

6. Jyoti Structures, India
7. Damaodar International, India
8. Larsen & Toubro (L & T), India

The main principle of their business is based on good contacts with the SEBs and to source cheap products from the manufacturers (*Powerline, Sept. 2003*).

The Global EPC contractors who are not electrical equipment manufacturers, are not expected to enter Indian market, as the market is not lucrative with intense domestic competition. However global electrical equipment manufacturers viz. ABB, ALSTOM, SIEMENS, SCHNEIDER etc. and domestic companies such as BHEL, CGL, Andrew Yule etc. listed in 3.6.1 are expected to extend their activities to include EPC contracts, with a view to increase sale of their equipment in the process.

The project aims to provide an insight that the equipment manufacturers, especially, the multi product companies will be in a better position to execute the turnkey contracts.

### **3.7 Competitors Analysis**

It is assumed that the increased in-house manufacturing capability provides certain advantage to the organization to compete in the arena of projects and equipment based services. Thus the main companies are hereby compared on the basis of manufacturing capabilities in various segments. The various manufacturers of different kV class equipment are tabulated below based on the industry feedback collected from various sources in the industry, market intelligence of BHEL, and the reviews in the Power line and IEEMA magazines. The transmission and Distribution voltages are specified in Kilo Volts (kV). Transmission voltages are above 33kV and Distribution voltages are up to 33kV.

**Table 3.2 : 400 kV Equipment Manufactures Product Mix**

Company	TRF	C.B	C&RP	CT/CVT	PT	LA	Structure
ALSTOM	Yes	No	Yes	No	No	No	No
SIEMENS	No	No	Yes	No	No	No	No
ABB	Yes	Yes	Yes	Yes	Yes	No	No
CGL	Yes	Yes	No	Yes	Yes	Yes	No
BHEL	Yes	Yes	No	Yes	Yes	Yes	No
L&T	No	No	No	No	No	No	Yes
BSES	No	No	No	No	No	No	Yes

*Source : IEEMA Annual production figures 2003-04, circulated to members.*

**Table 3.3: 220 kV & 132 kV Equipment Manufactures Product Mix**

Company	TRF	C.B	C&RP	CT/CVT	PT	LA	Structure
ALSTOM	Yes	Yes	Yes	No	No	No	No
SIEMENS	No	No	Yes	No	No	No	No
ABB	Yes	Yes	Yes	Yes	Yes	No	No
CGL	Yes	Yes	No	Yes	Yes	Yes	No
BHEL	Yes	Yes	No	Yes	Yes	Yes	No
L&T	No	No	No	No	No	No	Yes
BSES	No	No	No	No	No	No	Yes

Source : IEEMA Annual production figures 2003-04, circulated to members.

**Table 3.4 : 33 kV Equipment Manufactures Product Mix**

Company	TRF	C.B	C&RP	CT/CV T	CAP	PT	LA	Structure
ALSTOM	No	Yes	Yes	No	No	No	No	No
SIEMENS	No	Yes	Yes	No	No	No	No	No
ABB	No	Yes	Yes	Yes	Yes	Yes	No	No
CGL	No	Yes	Yes	No	No	Yes	Yes	No
BHEL	No	Yes	Yes	No	Yes	No	No	No
L&T	No	No	No	No	No	No	No	Yes
BSES	No	No	No	No	No	No	No	Yes

Source : IEEMA Annual production figures 2003-04, circulated to members.

The abbreviations used in tables above are: TRF – Transformer; C.B – Circuit Breaker; C&RP – Control & Relay Panel; CT – Current Transformer; CVT – Current Voltage; Transformer; CAP – Capacitor; PT – Potential Transformer; LA – Lightning Arrestor.

### **3.8 Major Customers**

The main customers in the segment have been segregated into three distinct categories. These are

1. State Electricity Boards (SEBs)
2. Central Public Sector Undertakings (PSUs)
3. Private Utilities

### **3.8.1 State Electricity Boards (SEBs)**

As on date major SEBs have been decentralized into different companies. However, despite the availability of loans and greater accountability the work culture has not improved significantly. The payments and the decision making still takes a long time. The major SEBs procuring are:

1. APDISCOMS (Andhra Pradesh Power Distribution Companies)
2. KPDISCOMS (Karnata Power Distribution Companies)
3. HVPNL (Haryana Vidyut Parishad Nigam Ltd.)
4. PSEB (Punjab State Electricity Board)
5. JVVNL, AVVNL, JDVVNL
6. GEB (Gujarat Electricity Board)
7. MSEB (Maharashtra State Electricity Board)
8. TNEB (Tamilnadu Electricity Board)
9. WBSEB (West Bengal State Electricity Board)

The electricity boards in Bihar, Jharkhand, Northeastern Indian states are yet to acknowledge the development process and are extremely slow in this regard.

### **3.8.2 Central PSUs**

In order to put emphasis to the whole process, government has roped in central PSUs like PGCIL & NTPC to manage some circles in the distribution business. This is mainly to use the expertise of these companies in the mega projects, in the lower segments. This has led to the creation of new organizations called GENCOS i.e. Generation Distribution Companies. NTPC has been given the charge to manage the KANPUR Electric Company and the PGCIL is likely to take up few circles in the northeast part of the country (*TERI Newswire, Sept. 2003*).

### **3.8.3 Private Companies**

The process of the reforms has been speedy enough to encourage some of the states to go for the privatization of the distribution network in the states. The foremost in this regard is Delhi where the distribution of power is in the hands of BSES and Tata Power. These two companies are also managing the power distribution in Mumbai. The main features (*TERI Newswire, 2003*) of these organizations are:

1. Fast decision making – Major policy decisions taken in the first two years of operation regarding revamping of 360 nos. 33/11 kV distribution stations and construction of 100 new 33/11kV distribution stations.

2. Efficient power management – Power cuts (Load shedding) reduced by 12% in 2002-03.
3. Procurement of quality products – Done away with the SEB concept of lowest bidder and introduced the concept of long term partnership with vendors.
4. Timely execution of the projects – No time and cost overruns in the building of new substations in 2002-03.
5. Efficient billing and services to the consumers – 100% metering in the zones achieved with on-spot billing.
6. Strict organization structures and high accountability of the employees.

Apart from BSES and Tata Power, there have been a few other Private Companies like AECO ( Ahmedabad Electric Company) and SEC (Surat Electric Company) operating in some select cities of India. Then there are also huge private companies in the steel industry, cement industry, Petrochemicals industry etc who have been maintaining their own distribution network.

### **3.9 Conclusion**

The discussions in this chapter bring out some of the complex issues facing the electric power sector around the world and in India. The experience so far clearly underlines a few important lessons.

First, it will be best not to rely on replicating the experience of other countries by blindly imitating them. India is a case apart, sui generis, and must be treated as such.

The model of reforms in the power sector propagated by the World Bank too needs to be examined critically in the Indian context where the axiom is what is good in economics is bad in politics.

Second, privatisation is not a panacea for all ills. Recent report of the Reserve Bank of India shows that incremental Non-Performing Assets (NPAs) of private sector banks are even higher than those of the public sector banks (*The Economic Times, June 2004*) In the power sector itself, the controversies surrounding the generation projects of Enron, Cogentrix and Spectrum bear a testimony to this. Privatisation of distribution in Orissa has raised a number of doubts about the practicability, feasibility or even advisability of privatisation of power distribution on an all-India basis (*Powerline, July, 2003*)



Third, what is important is not public or private ownership but the policy framework in which any institutions in the sector will have to operate. The importance of this is further underlined by the large-scale exodus of foreign companies.

Fourth, creating and sustaining investor confidence is the key to power sector reforms. This would imply viable and rational policies implemented in a transparent manner. Guarantees by state governments, counter-guarantees by the centre and escrow accounts are not substitutes for properly designed policies.

Fifth, temporary palliatives such as securitisation of dues of SEBs to central PSUs or writing off loans given by the state government to SEBs or converting them into equity are not the answers to the problems on hand as they merely mean postponing the day of reckoning.

Finally, the role of state governments is critical in power sector reforms. Unfortunately, this is the weakest link in the chain and a chain is only as strong as its weakest link. The critical factor in the power sector is one of governance. Unless the issues in this regard are addressed, the forward looking Electricity Bill, 2001, even if it becomes an Act, may prove to be a dead letter.

While the reforms may undergo certain changes on account of political compulsions and also feedback during implementation of various phases as well as for reasons listed above, yet the broad parameters of reform and privatization remain a certainty and these factors have to be taken into consideration by the electrical equipment manufacturers in evolving their marketing strategies.

## **Chapter 4 - Demand Estimation**

### **4.1 General Description**

Demand estimation is the most important segment of the report and forms the basis for the key parameters explained below. However, the correct estimation of the demand is not possible due to various factors coming into play. The business environment in the power distribution business is in the transition stage and the exact outcome of the reforms process is uncertain. The report tries to gather information from the secondary sources and tries to establish a link with the primary data collected. The report also tries to explain the various areas where the investments are planned, but it seems to forecast the exact time and the quantum of investments. However, the report tries to establish the priorities of investment through logical reasoning and the results of the responses from the customers. In the current study the demand in India forms the basis of the all the key parameters like:

1. Market dynamics
  - a. Government Policies
  - b. Nature of Procurement
  - c. Frequency of Procurement
2. Competition: Emerging and existing
  - a. Change in existing players
  - b. Emergence of new players from diverse fields
  - c. New formations and alliances to tap the market
3. Proposing marketing strategy after
  - a. SWOT analysis
  - b. Industry attractive analysis
  - c. Competitor evaluation

In this scenario the demand estimation forms the key role in proposing the effective solution to the problem of providing. On careful analysis of the scenario, it has been observed that the demand in the **Power distribution reforms is the derivative of all the investment** being made in the following heads, which have mostly been collected from the secondary data. These are:

1. Investment in the generation sector as per 10<sup>th</sup> (2002-2007) & 11th plan (2007-1012).
2. Investment in the Accelerated Power Development and Reform Programme. (APDRP)
3. WB / ADB loans for power distribution reforms in the country
4. Investment being made by Private companies to strengthen the power distribution setup in respective circles.

However, the secondary data collected was scrutinized and transformed based on the results of the questionnaire and the personal interviews conducted with senior officials in CEA, BHEL, ALSTOM, Siemens, CGL and IEEMA officials. Also the questionnaire was formulated to judge the shift in demand towards the turnkey solutions rather than equipment purchase and also the reasons behind it.

## **4.2 Major Areas Of Investment**

In order to provide an effective study and recommendations there of, I have limited my study to the distribution sector. The sub transmission and distribution area account for the major losses and the maximum investment is planned in this area in the coming years. These include all the equipments from 220 volts to 33000 volts (33 kV). The major area and equipments involved in the distribution segment are:

- New Stations with / without line
- Refurbishment
- Metering
- Relaying of conductors or Cables
- Instrument Transformer Series
- Automation
- Demand Self Management
- Operations & Maintenance
- Gas Insulated Substations (GIS), Load planning, system studies
- Compensation

### **Priorities of Investments**

Among the above mentioned areas, the products are being prioritized on the basis of their ability to provide maximum contribution to the cause of development which include

- 1 Metering of the power at all feeders
- 2 Minimizing the electric distribution losses
- 3 Maintaining the stability and reliability of power supply to the end users

- 4 Improving the quality of power
- 5 Customer mapping and customer satisfaction

In the above mentioned requirements the category 1 i.e. the metering of feeders is more than 90% complete in all the states (*Powerline Jan-Feb., 2003*). In view of this, the main scope of work lies in improving the stability and reliability of power supply and minimizing the losses. The actions required for the above-mentioned process are as follows:

1. Improving the status of the substations by replacing the worn out equipments more than 25 years old, in the grids of Indian states.
2. Creating new substations to bear additional load requirements.
3. Increasing the transformation capacity of the substations i.e. increasing the number of transformers in the circuit.
4. Improving the power factor of the system by increasing the no. of capacitor units in the circuit.

These priorities have been derived from the personal interviews with the industry experts and also following the demand pattern observed in the last two years. The CEA report on the metering solutions and areas was highly useful in determining these factors.

### **4.3 Factors Affecting Demand**

The data collected from different sources was analyzed and certain factors were considered to obtain a realistic picture of the demand finalization. These factors were mainly:

#### **4.3.1 Competitive forces**

The demand projection in the next few years under ideal conditions is very high. This is likely to encourage more players to enter into this business and thus leading to the competition. The competitive forces are likely to bring down the price levels and thus despite the high physical demand the financial value of the demand is likely to fall in some cases. This trend was observed mainly in the demand of the energy meters. The market prices of the meters have fallen drastically in the last 2-3 years and are now likely to increase mainly because of the customer's requirement of high-end meters. Similar trend is also being observed in the substation business as a whole. The increased demand is encouraging small electrical contractors to invest money in this business.

### **4.3.2 Political Factors**

It is observed that the speed of the reforms under the present government is a very fast and the same may get jeopardized in the event of change in government. The demand estimation considered certain factor towards the reduction in the demand finalization in the event of any change in government and its policy towards reforms.

### **4.3.3 Increase in Raw material**

It is expected that the overall cost of the projects envisaged at the current price level may increase due to the increase in the raw materials like steel, copper lamination and the wage rates. This is likely to escalate the total costs of the projects leading to cost overruns and overall reduction in the implementation process.

### **4.3.4 Slow speed of implementation**

The current speed of implementation is much slower than the actual required. The SEBs like WBSEB, MPSEB, MSEB are yet to bifurcate / trifurcate into different transmission and distribution companies. The reforms process in these areas is likely to fall back due to the lack of implementation capabilities among the executives of these regions. The first phase of the metering of 11kV feeders shows that many states are even falling from the initial target of metering and unbundling.

## **4.4 Estimation Of Demand**

The results obtained from the demand estimation have been classified in the following categories, which are explained on individual basis.

1. Products involved in distribution business and market sizes
2. APDRP investments and the likely shortfall
3. General estimates of equipments required in substations
4. Demand of products and services from the questionnaire

### **4.4.1 Products and Market size**

The general estimates of the industry size of various equipments used in the Distribution business along with estimate of no. of players sharing this volume of business is furnished in the table in next page. In order to establish this demand, the data was collected from the IEEMA production figures. The data collected was mainly in the form of the physical values. The data was then compared to the projections made under various forums for the major products due to the impact of opening up of the power sector. This data was then linked with the price per unit prevailing at the current level and the expected rise or fall due to the

- ❖ Effect of competition,
- ❖ Imports,
- ❖ Changes in technical parameters
- ❖ Rise in the cost of raw material

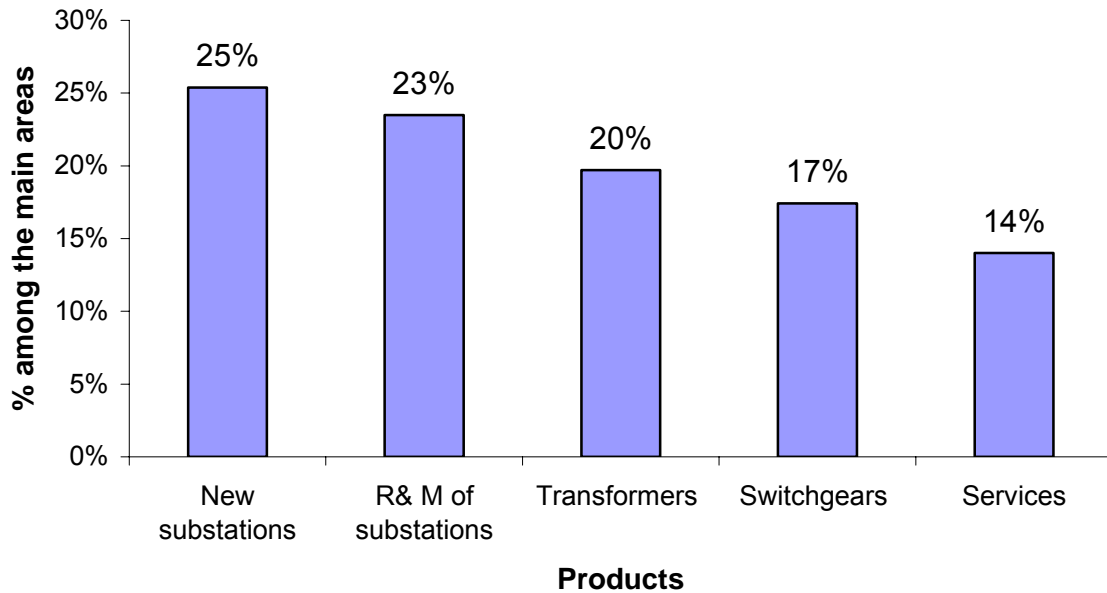
The same have been compiled in the given table below and the end result has been depicted in Fig. 4.1 in the next page.

**Table 4.1 : Market Demand for Electric Distribution Equipment**

Product	Approx. market size	No. of players	Remarks
Transformers	Rs.3000 million (55 million Euro)	15-20	Highly fragmented market with stiff competition and no major player
Switchgear	Rs.3000 million (55 million Euro)	6-8	Concentrated market with major players and technology dominance
Instrument transformers	Rs.1000–1500 m. (18–28 mill. Euro)	15-20	Highly fragmented market with stiff competition and no major player
H.T. Capacitors	Rs.750-1000 mill. (14-18 mill. Euro)	5-6	Mainly dependent on projects as loose equipment sales are quite less. Price sensitive market despite limited competition.
Energy Meters	Rs.3500-4000 mil. (60-72 mill. Euro)	45-50	Transformed into a small-scale industry. Dependent on imported kits from China-Taiwan belt and assembly and testing in India.
Control & relay Panel	Rs.1500-2000 mil. (28-38 mill. Euro)	15-20	Fragmented market. No technology involved, mainly in the control panels of small-scale manufacturers who buy relay and components from market and assemble them in sheds with low overhead costs.

*Source : Indian Electrical & Electronics Manufacturers Association (IEEMA) Annual production figures 2003-04, circulated to members and comparative statements of Tender opening results*

**Fig. 4.1 : Estimated investment pattern in Electric Power Distribution**

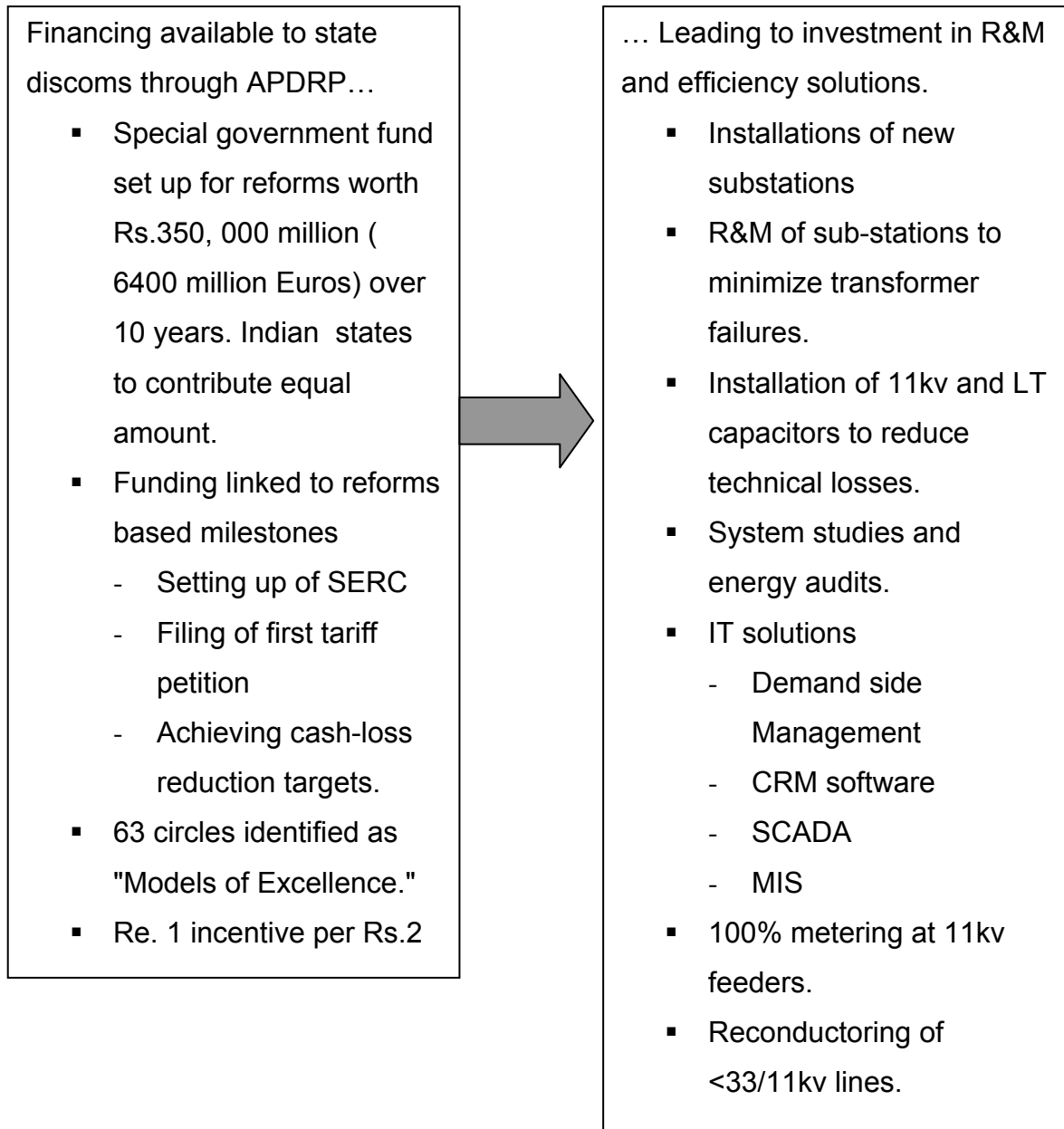


#### **4.4.2 APDRP Investments:**

The major flow of investments in the distribution business is from APDRP. The government is planning to spend Rs.400,000 to 500,000 million (7200 – 9000 million Euros) in the 10<sup>th</sup>(2002-2007) and 11<sup>th</sup> plan (2007-12). However as per the latest estimates on effective utilization of the funds it is observed that the SEBs / Utilities are unable to use the total funds allocated to them under the scheme. While evaluating the final figures, it was also assumed that the rate of utilization is likely to increase gradually and hence the demand is also expected to rise in the coming years. However the actual planned inflow of funds exceeds the actual finalization/ utilization expected by a great quantum. These factors were also considered during evaluating the total demand for the products and services in the coming years. The data and the chart depicting the same are also enclosed. The investment plan for the year 2003-04 is also enclosed for ready reference.

However, the following description makes APDRP as the front-runner in driving the investments in the distribution sector:

**Table 4.2 : Effects of APDRP investments on Distribution sector**



Source : Govt. of India, Report of the expert group on restructuring of SEBs, July 2002

#### **4.4.3 Estimation for a sample 33 / 11kV substation**

Furnished in the table in next page is a rough estimate of a 33kV or 11kV standard distribution sub-station, based on the existing price levels obtained through various tender bid opening results available with BHEL.



**Table 4.3 : Cost Estimate of 33kV Sub-Station**

Sl. No.	Description	Qty.	Value
1	Transformers	1 no.	Rs. 3,000,000 (55,000 Euros)
2	Circuit breakers 33kV	2 nos.	Rs. 500,000 (9,100 Euros)
3	Circuit breakers 11kV	10 nos.	Rs. 3,000,000 (55,000 Euros)
4	Control Panels		Rs. 600,000 (11,000 Euros)
5	Isolators	20 nos.	Rs. 600,000 (11,000 Euros)
6	Capacitors		Rs. 200,000 (3,700 Euros)
7	Lightening arrestors, CTs PTs etc.		Rs. 500,000 (9,100 Euros)
8	Structures, civil work & installation cost		1,000,000 (18,200 Euros)
	<b>Total</b>		<b>9,400,000</b> <b>(172,000 Euros)</b>

Source : Comparative statements of Tender Opening results available in BHEL records.

Thus the approximate estimates for a new 33 / 11kV substation with normal load is around Rs. 10 millions (180,000 Euros). This provides a general estimate that the APDRP funds of Rs. 100,000 millions (1800 million Euros) to be spent in first phase is mainly restricted to the modernization of the old substations and creations of new substations.

#### **4.4.4 Findings From Response To The Questionnaire**

Tabulated in the next page is the total demand estimated in the next five years, based on the response to question no. 37 of the Questionnaire, i.e. total demand expected in the distribution business in the next five years.

On comparing the published demand information with the response of the questionnaire, it has been observed that most of the respondents indicated that the

**Table 4.4 : Demand estimate from response to customers**

Total demand in the respondents state	No. of respondents	Total demand in million Rupees	Total demand in million Euros
Rs. 10,000 million ( 180 million Euros)	4	40,000	730
Rs. 20,000 million ( 360 million Euros)	9	180,000	3,300
Rs. 30,000 million ( 540 million Euros)	10	300,000	5,500
Rs. 50,000 million ( 900 million Euros)	2	100,000	1,820
70,000 & above ( 1100 million Euros)	0	0	0
Total		620,000	11,350

Source : Response to Question no. 37 of the Questionnaire

likely demand would be in the region of Rs 20,000 to 30,000 millions (350 million to 550 million Euros). On calculating the same in terms of the total demand estimates for the country, the investments are summing up to a whopping Rs. 620,000 millions (11,250 million Euros). However, the mode of the results indicate that the demand shall be in the region of Rs. 180,000 million to Rs. 300,000 million (3250 to 5500 million Euros). This is also inline with the results of the APDRP projections that indicate a planned outlay of Rs. 350,000 million (6500 million Euros). But the actual expenditure is always falling short of the planned expenditure. Thus it can be roughly estimated that the demand finalization in distribution sector may range from Rs. 200,000 million to Rs. 300,000 million (3500 to 5500 million Euros), in the next five years.

In order to reconfirm the future demand and investments, the respondents were asked to indicate the probability of the investments in the areas of new substations, R& M of substations, loose products like transformers and switchgear and other IT enabled services. The customer considered that the investments in the New Substation and the R & M of substations are likely to be high. The services are likely to get the least importance at the current time.

## **Chapter 5 - Analysis**

### **5.1 Business Environment Scan Results**

The research was conducted on a sample size of 25 respondents. Though the sample size appears small it covered the entire gamut of customers, consultants, contractors, planners, Pvt. Players etc. and varied widely across the country with diverse views & levels of performances. The sampling process considered to interview / get the response from at least one respondent from each customer segment in the electric power distribution sector to ascertain objectives. The samples had not been drawn at random but chosen such that the samples are involved in this type of business activity and are aware of the various facets of turnkey concept to give correct opinion about it. The study was conducted through marketing officials of BHEL of Regional Operations Division (ROD) located all over India, who could explain the need of correct answers to the respondents. The same was also verified by the personal interview conducted by a parallel person in the same customer segment. The respondents were mainly from the purchase and the operations department of the customers. Five samples have been drawn from each customer segment i.e. SEBs, Utilities, IPPs, Consultants and Contractors. In sampling special emphasis have been given to SEBs, which are more progressive like HVPNL, PSEB, DVB, APDISCOMS, and KPDISCOMS & MPSEB. The personal interviews were conducted with respondents from CEA, PGCIL, BHEL, ABB and ALSTOM. This ensured a great variation in terms of respondent that included actual customers, policy makers and major suppliers. Guidance was also taken from friends in consultants like Mckinsey etc. who provided the viewpoint of senior executives of various industries. The data obtained from the questionnaire and the study of the business environment has been segregated as per the objective of the report and a separate section provides insights to the findings of the study.

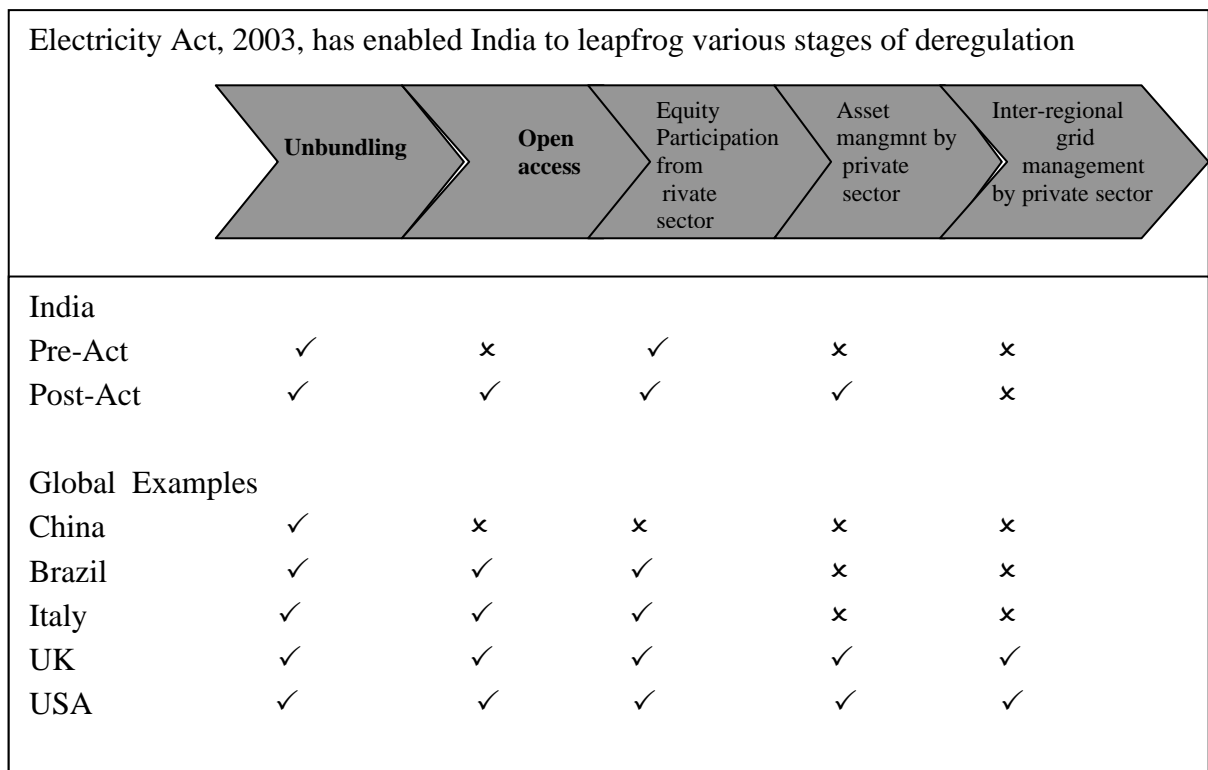
In the process of formulating the strategies for marketing of turnkey solutions for distribution business the environment was scanned on the following parameters:

1. **Current Status:** - Indian Distribution scenario is passing through a transition phase in which the consumers, the customers and the suppliers all are hopeful towards the better future. The demand is rising in almost all the area, which is being reflected in the production figures being published by IEEMA. This is also reflected in the growth experienced by the manufacturing sector of the Indian economy. In the present scenario SEBs are moving fast towards liberalization and privatization of the power distribution business. The

distribution companies are giving positive indications towards reduction in financial as well as transmission and distribution losses.

The Electricity Act 2003, enacted by the Parliament of India, received the President's assent on 26<sup>th</sup> May 2003 and came in to force on June 10, 2003. The main aim of the Act was to consolidate the laws relating to generation, transmission, distribution, trading and use of electricity and generally for taking measures conducive to development of electricity industry, promoting competition therein, protecting interest of consumers and supply of electricity to all areas, rationalisation of electricity tariff, ensuring transparent policies regarding subsidies, promotion of efficient and environmentally benign policies constitution of Central Electricity Authority, Regulatory Commissions and establishment of Appellate Tribunal and for matters connected therewith or incidental thereto.

**Fig. 5.1 : Stages of deregulation as per Indian Electricity Act 2003**



Source : URL:<http://www.mu.ac.in/Departments/economics/papers/WP11.pdf>

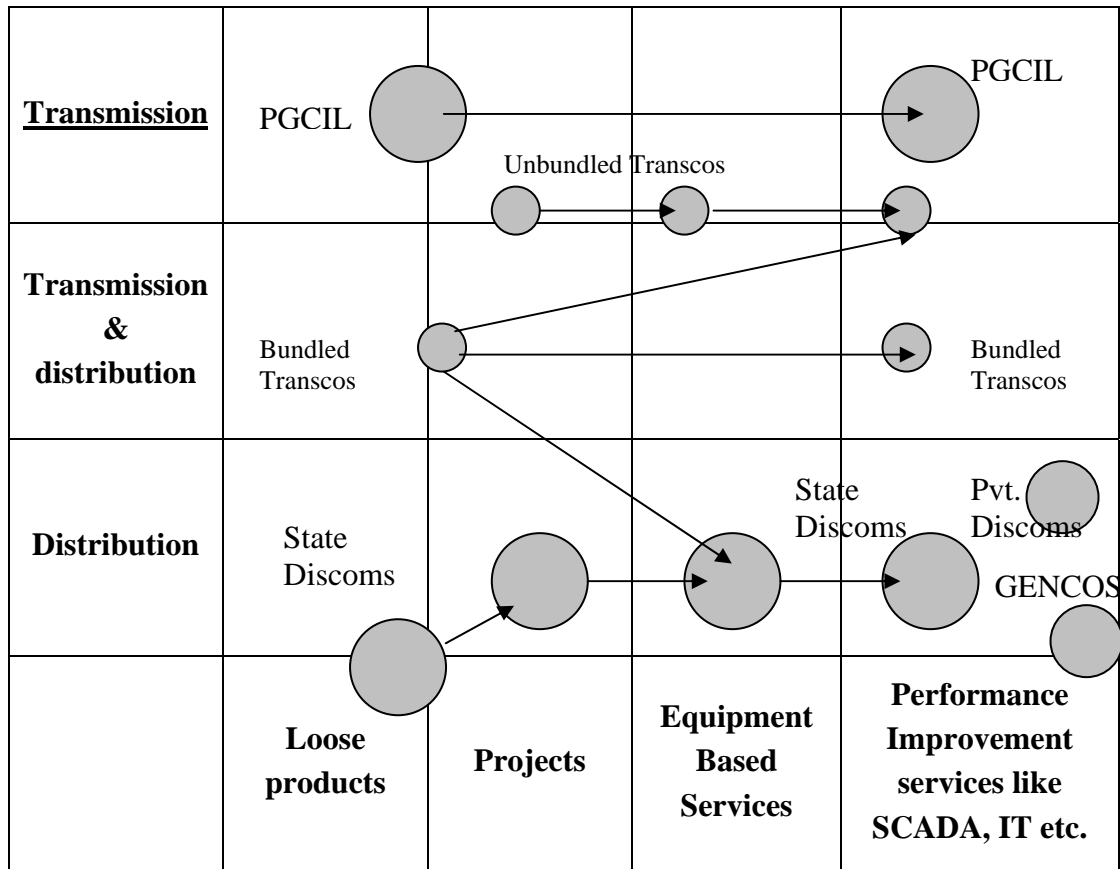
This act could enable India to be on par with UK & USA, to leap frog certain stages of deregulation as compared to China, Brazil or even Italy. Two such stages are the "open access" of distribution networks in order to facilitate direct sale of power by generators to the final consumers and asset management of

the power distribution network by the private sector. The inter-regional grid management would still remain with the Public Sector POWERGRID, unlike in the US or UK. But considering the political complexities of the Indian Scenario and the exemplary record of POWERGRID in the inter-regional grid management, this appears to be a wise move.

1. **Government initiative in the area:** - The Central Government is putting in best efforts to improve the power scenario of the country. Special cell has been opened in Ministry of power headed by a joint secretary to monitor and implement the plans for the distribution sector. All SEBs are being monitored on the utilization of funds allocated to them for the power distribution reforms. Besides this Government has also roped in Central PSUs as consultants to the APDRP. These Central PSUs are also being persuaded to take up the implementation of reforms and manage a few circles on their own. In line with the requirement NTPC has taken over the management of Kanpur Electric Supply Co. and is investing money in renovation and modernization of the equipments and offering better services to the consumers. Similarly PGCIL is implementing the reforms process in the state of Madhya Pradesh mainly in the region of Ujjain and Indore.
2. **Likely effect of reforms:** - Overall result of the reform process is not very encouraging as the plans are falling short of the target. However, the efforts under process are very encouraging. The likely effects can be summarized as below:
  - a. Formulation of new Electricity bill 2001.
  - b. Growth in demand of goods and services.
  - c. Formulation of separate distribution and transmission companies leading to greater accountability of work force.

The Figure in the next page depicts the structure and the trends of the Transmission and Distribution set up of Electric Power, in India. The transmission network would remain controlled largely by the Central Transmission company (POWERGRID), State T&D companies and State Transmission companies formed by the unbundling process. The distribution network would in future be controlled by State T&D companies, State Distribution companies (State Discoms) and Private Distribution companies (Pvt. Discoms).

**Fig. 5.2 : Post Reform Trends of Transmission & Distribution (T&D) in India**



Source : Powerline, Magazine on Power, N.Delhi, Vol. 8 Issue 5, Feb. 2004

The above chart highlights the following trends

1. The T&D market is fast moving away from purchase of loose products towards the Projects and equipment based services.
2. In the transmission business the State Transco and PGCIL will continue to have the major share.
3. In the Distribution business, the state discoms are moving in a systematic method from loose equipments to projects and to IT and SCADA implementation.
4. The distribution business is observing the growth of private players, whose share is likely to increase in the near future.
5. A number of GENCOs ie. Distribution groups of large private generation companies may emerge.

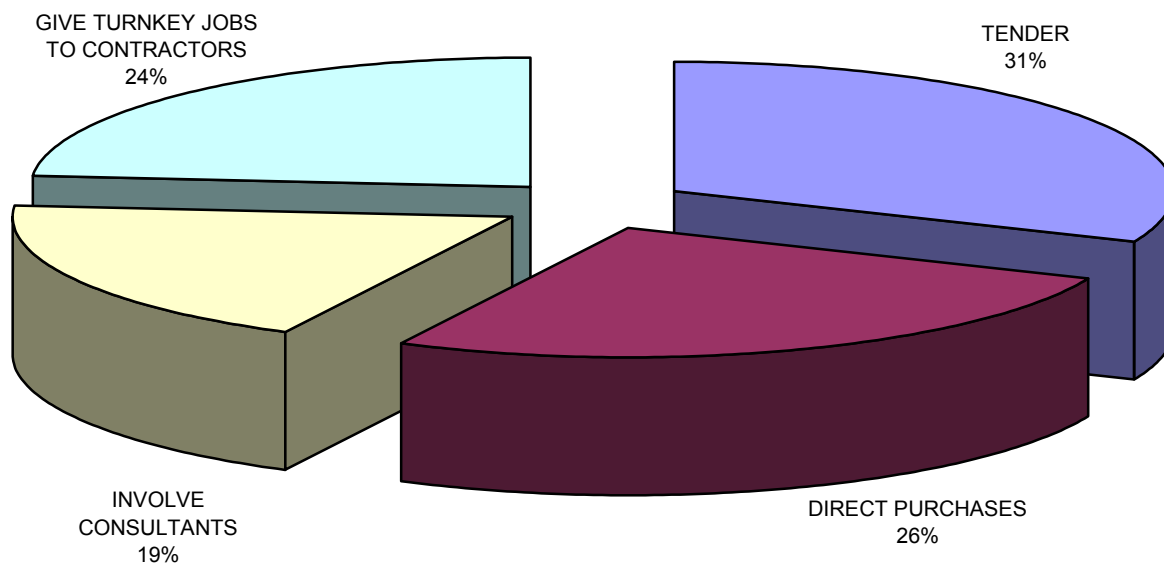
## 5.2 Analysis Of Buying Behaviour – Pre-Reforms

In order to meet the objective of the report, the buying pattern of the customer in the pre reform era has been analyzed. The result has been derived from the responses of question no. 11 to 18. Each of the case has been separately analyzed and depicted along with the response and the chart.

### Question No. 11 Purchase Methodology

In order to ascertain the purchase methodology of the customers, the respondents were asked about the routes towards purchase i.e. whether it's through tenders, direct purchases through OEMs, through consultants or through turnkey contractors. The results indicate the majority of the customers preferred the tender route to purchases as indicated by over 30% of the respondents. The direct purchase through OEMS was the second most important method but the results were obtained with qualifying remarks of small purchases or spares. The turnkey contract was also popular but to a lower extent at 24%. The purchase through consultants was observed only from the companies like IOCL, HPCL, Gail etc who involved some consultants to procure the products and services.

**Fig. 5.3 : Purchase Methodology**

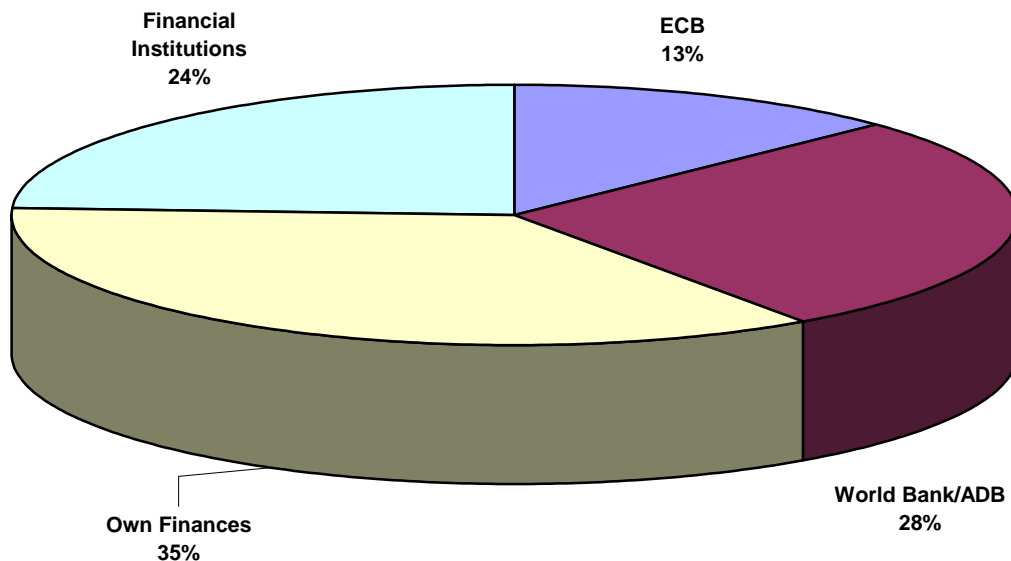


*Source : Response to Question no. 11 of the Questionnaire*

### Question No. 12 Project Funding

Majority of the customers are funding the projects and their loose purchases from the domestic funding or own funds. The trend of funding through own finances was hindering the growth and development of the distribution business. Primarily because this area was considered secondary title generation in almost all the SEBs and the major chunk of the funds was diverted towards the addition of the generating capacity. Thus the government also encouraged Funding through financial institutions and World banks loans on conditional compliance of the SEBs. Though the result has not shown special preference to this segment but it is estimated that the areas of funding will increase in the near future.

**Fig. 5.4 : Project Funding**



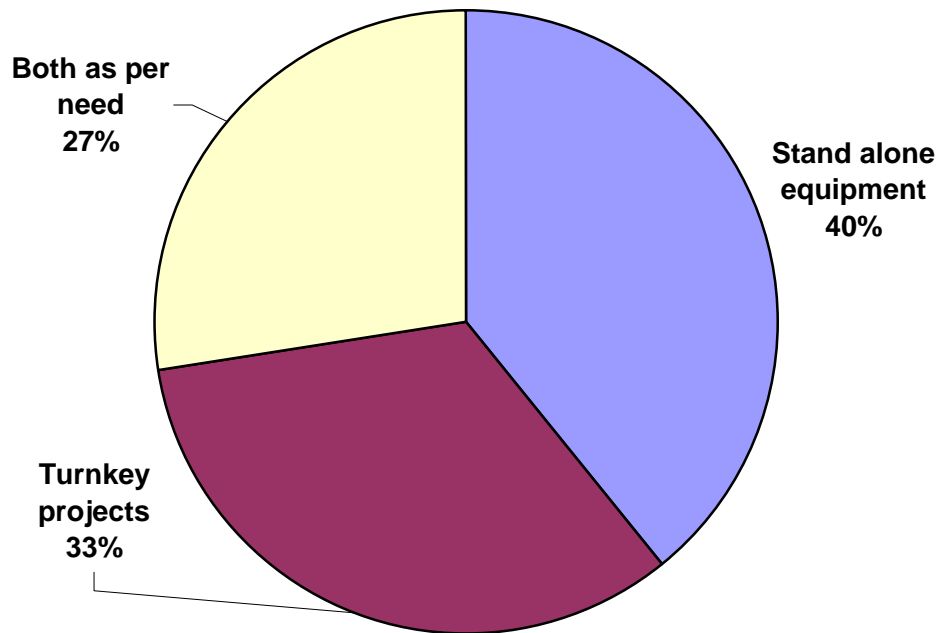
*Source : Response to Question no. 12 of the Questionnaire*

### Question No. 13 Buying Pattern

In this case the purchase methodology of the customer in the pre reform era was analyzed. The results were much in line with the expectations. The responses indicate that the majority of the customers preferred to buy loose equipments and build up substations themselves through petty local contractors. This was mainly because of the huge manpower in the SEBs, which required to be employed, and also due to the lack of the environment wherein the contractors were ready to take up the installation of the total substation. As per the response 39% customers preferred to procure stand alone equipments and 33% preferred turnkey projects. However, the averages shown in the table indicate the strong preference towards the stand-alone equipments.



**Fig. 5.5 : Buying Pattern Pre-Reform**



*Source : Response to Question no. 13 of the Questionnaire*

The results obtained from the other questions have been listed below:

**Question No. 14 Decision time:** The time taken to complete the procurement process of a single product varies from 3 to 12 months. The responses received are more towards the period to 6 to 12 months. As the products being purchased are generally costly and the tendering process governs the purchase process, this time period is fairly justified. However responses from a few customers also indicated periods greater than 12 months.

**Question No. 16 Buyer selection procedure:** In this case the results available are in tune with those of question no. 11 wherein the responses indicated a marked preference for the tender process. The responses to this question indicate that the suppliers were selected on the basis of tender and order being given to lowest one or two bidders.

**Question No. 17 Buying Frequency:** The buying frequency indicates that there is no set pattern followed by the SEBs in the pre-reform era and the equipments were procured as and when required.

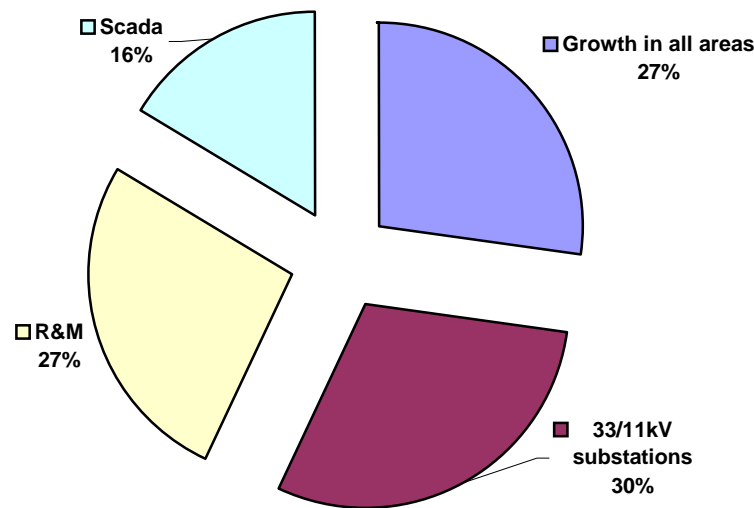
### 5.3 Analysis Of Buying Behaviour – Post-Reforms

The buying behaviour of the customers was also analyzed in the post reform era. In this process the results of question no. 19 to 25 were observed in comparison to those received in the previous section. The important results have been depicted with chart.

#### Question No. 19 Impact Of Reforms On Growth.

The respondent's reply regarding the likely areas of growth indicated a marked preference towards the strengthening of the sub transmission segment i.e. the increased network of 33/11kV substation and renovation of old substations to increase the power carrying capacity. Actually when the same question was analyzed with the experts it was observed that the major losses take place while transforming the power from the 132kV to a 33kV and then to 11kV segment. It was mainly because of fewer addition of transformer and associated equipment required for efficient transformation. Thus the first preference of all the respondents emerged to be the strengthening of this area.

**Fig. 5.6 Expected Growth in Different Areas**



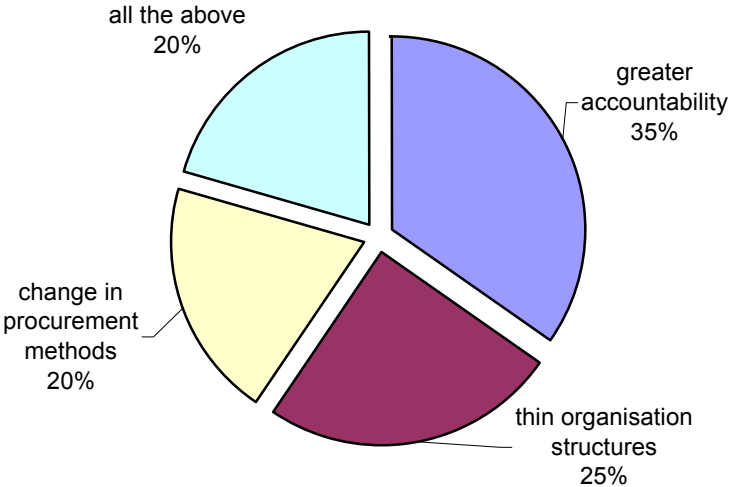
Source : Response to Question no. 19 of the Questionnaire

#### Question No. 20 Impact Of Reforms On Organsiation Structure

In order to understand the organization level changes leading towards turnkey solution, the effects of APDRP and other reform activities on the organization structure were also probed. Interestingly, majority of the respondents were of the view that there is likely to be greater accountability (35%) and slim organizations (25%) in future. Thus it will lead to outsourcing of the services from contractors or lead to purchase of equipment-enabled services. This is also likely to lead to change in

procurement methods but the result of the questionnaire in this regard is not very encouraging. This trend enforces the concept of turnkey business solution in this area in near future.

**Fig. 5.7 : Changes in Organization Structure due to Reforms**

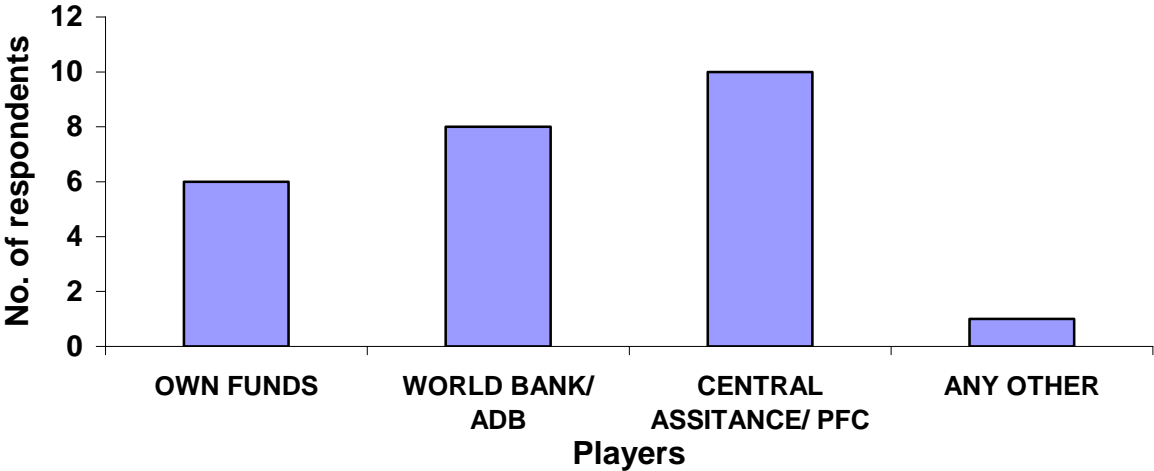


Source : Response to Question no. 20 of the Questionnaire

**Question No.22. Type of funding being used after reforms**

The responses have shown a clear shift from the own funds being used by the SEBs to the central assistance through PFC and APDRP. The results have been indicated graphically also.

**Fig. 5.8 : Post Reforms Project Funding**



Source : Response to Question no. 22 of the Questionnaire

**Question No. 25 To estimate the shift towards the turnkey concept.**

In this question the shift towards the turnkey concept in the post reform era has been analyzed. The results have indicated a positive shift towards the concept and respondents have acknowledged the better features of turnkey purchases. The results have been derived using the likert scale method.

**Question No. 23 Competition:** The respondents were required to answer the question regarding the rise or fall in competition in the post reform era. The results indicate a mix response with likely increase in competition from EPC contractor and equipment manufacturer joining the bandwagon of becoming EPC contractor.

**Question No. 24 Key Products:** - This required the respondents to identify the key products in the power distribution sub-stations. The responses indicate that transformers and switchgears have been identifying as a key products followed by control and relay panel and SCADA solutions.

#### ***5.4 Comparison Of Buying Behaviour During Pre And Post Reform Era***

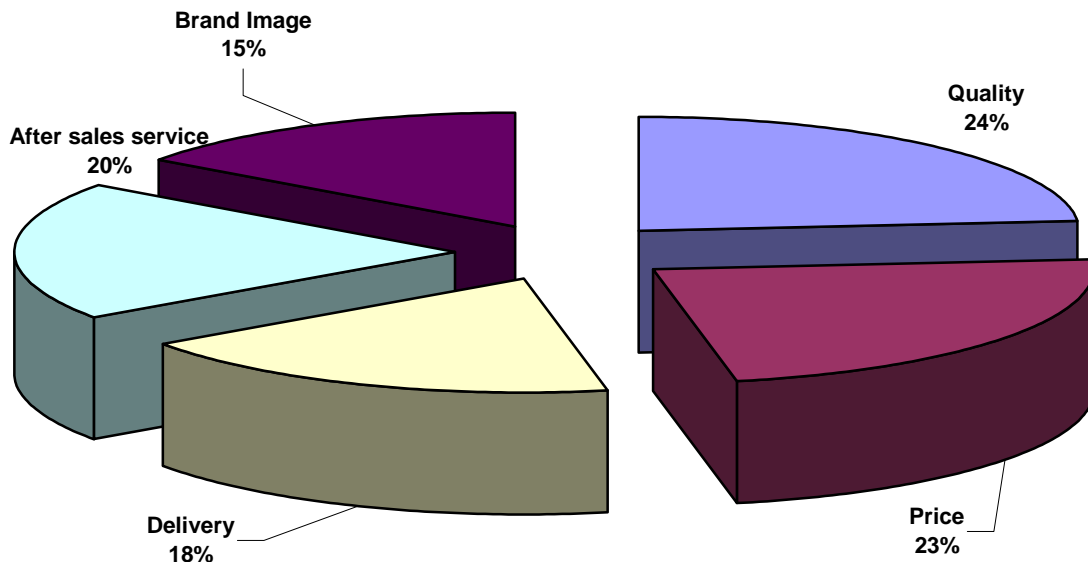
1. The buying pattern of the SEBs is shifting from the stand-alone products to the turnkey solutions. This trend is likely to be more prominent in the coming years.
2. The SEBs is now more dependent on the funds available from World Bank or ADB loans and central assistance for financing their procurements in the distribution sector. Prior to the reforms the SEBs mainly generated the funds themselves.
3. The purchase methodology is not witnessing substantial change in the post reform era as SEB still follow the tender route to purchase goods and services. However, the only difference observed is the pre qualification requirement in the tenders in post reform era. This has helped in restricting substandard and spurious suppliers from participation in important tenders.
4. The post reform era is witnessing greater accountability and thin organization structure. This has been acknowledged by majority of the respondents.
5. The post reform era is also providing growth opportunities in the distribution sector. However, the major gainers are new 33/11 kV substations and revamping and modernization of old substations.

## 5.5 Customers Preference And Competition

### Question no. 27 Rating of various attributes of products

The customers were asked about the importance given to quality, price after sales service, delivery and Brand Image. The results have been depicted in the chart which clearly marks that customer wants the best quality at best prices. The other factors take a back seat when compared to quality and price. The quality and price are the front-runners at 24% and 23% respectively followed by After Sales Service and the delivery. Interestingly, the customers are not interested in the brand image in the industrial purchases where as brands gain special importance in consumer items.

**Fig. 5.9 : Customers Criteria of vendor Selection**

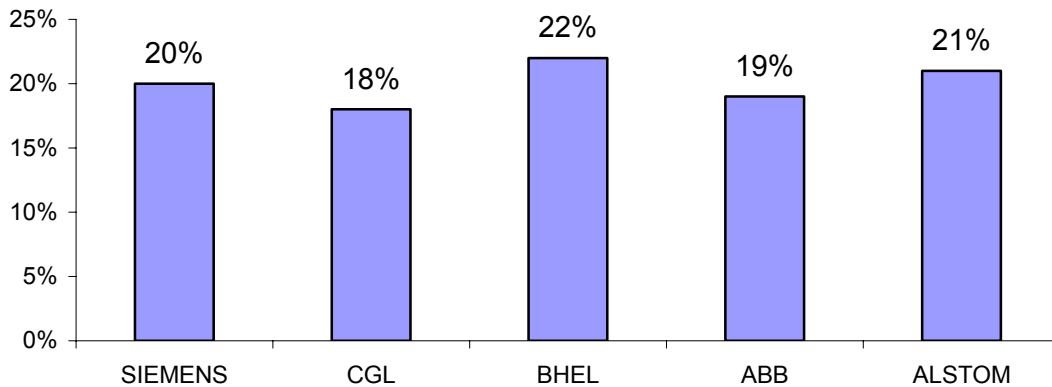


*Source : Response to Question no. 27 of the Questionnaire*

### Question no.28 Rating of the companies in terms of quality

As seen in the previous chart, customers perceived quality as the most important criteria of vendor selection. In this question, the respondents have rated the performance of the products of major equipment suppliers. This is based on the feedback of the performance of equipments like Transformers, Switchgears, Capacitors, Meters, Control and Relay panels. It has been observed that 22% respondents have rated BHEL with the best quality of products with an average score of 3.68. It is closely followed by ALSTOM at 21% and SIEMENS at 20%. Interesting result was that the quality of ABB has not been as perceived good despite new and latest manufacturing facilities in India.

**Fig. 5.10 : Product Quality Rating of Companies**

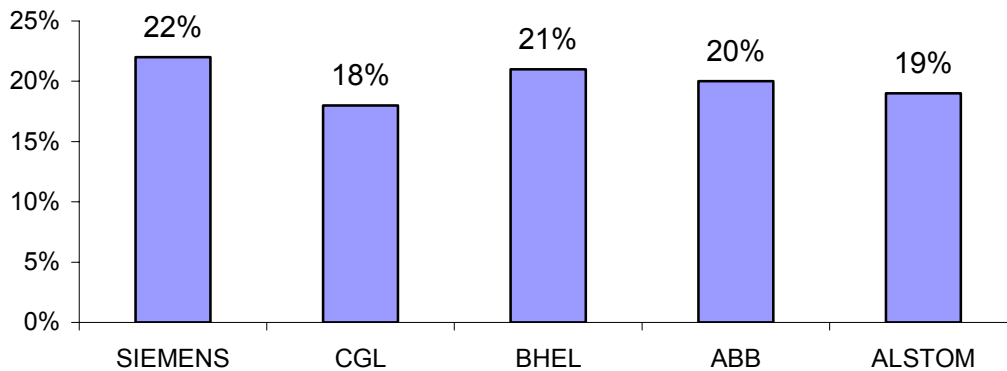


*Source : Response to Question no. 28 of the Questionnaire*

**Question no. 28 Rating of the companies in terms of price**

The price and the quality of the product are inversely proportional but the company who can offer best quality at affordable prices often turns out to be a winner in the competitive arena. The results of this question clearly represented that CGL at average score of 2.96 has positioned its products at the lower end in the price list and BHEL at 3.64 demands premium for the high quality it maintains. But ALSTOM at 3.2 seems to be offering the right combination of price and quality to the customer. Siemens is placed at 3.72 and ABB at 3.36. The same figure have been represented in the form of % of respondents that feel the price of the company is high.

**Fig. 5.11 : Price Competitiveness of Companies**

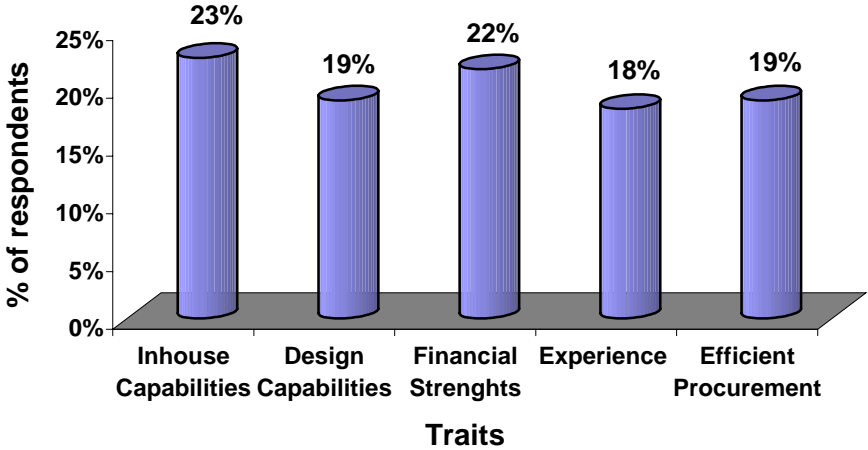


*Source : Response to Question no. 28 of the Questionnaire*

**Question no. 35 rating of key factors required for the execution of distribution substations**

The respondents were also required to tell about the key factors required for effective and efficient execution of substations. The result has been highlighted in the given graph, which highlights the need of in-house products and financial strengths of the contractor. According to majority of the respondents of the questionnaire and the personal interviews it was observed that while executing the contract, the contractor shall be financially sound to take care of any unforeseen problem arising at the site. This is feasible only if the contractor is financially big and also manufacturers some of the major products in house. It has also been confirmed from the personal interviews that many projects were held up due to poor financial strength of the contractors. Thus the result shows that in-house capabilities and the financial health are key factors rated important by 23% and 22% respondents. These are followed by design capabilities and the efficient procurement methods. However, the experience is least preferred that is why new players with above requirements are entering into this business segment.

**Fig. 5.12 : Customers preference for capabilities for Executing Turnkey Sub/Stations**



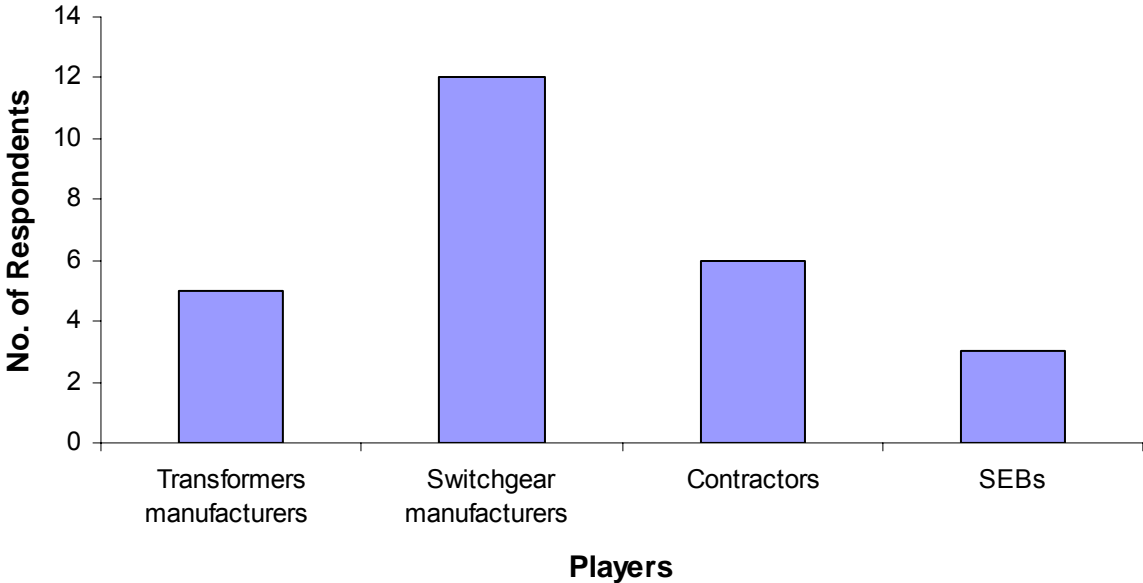
*Source : Response to Question no. 35 of the Questionnaire*

**Question no. 36 Which of the following are in a better position to execute distribution substations?**

Respondents' views were also invited on the evaluating the best industry to take up the job of contractors besides equipment manufacturers. The result showed that many customers preferred the switchgear manufacturers as best suited to address the demand of distribution substations. This also is evident from the chapter on demand estimation where in it was observed that switchgear and control gear formed

the major portion of the distribution substations. Also the highly fragmented transformer industry, with small players of low financial strength was not in a position to address the market effectively. However the main competition for the switchgear manufacturers is from the contractors who are already well established in the field of turnkey business and will put a strong front against erosion of their market share.

**Fig. 5.13: Competent players in executing distribution substations**



*Source : Response to Question no. 36 of the Questionnaire*

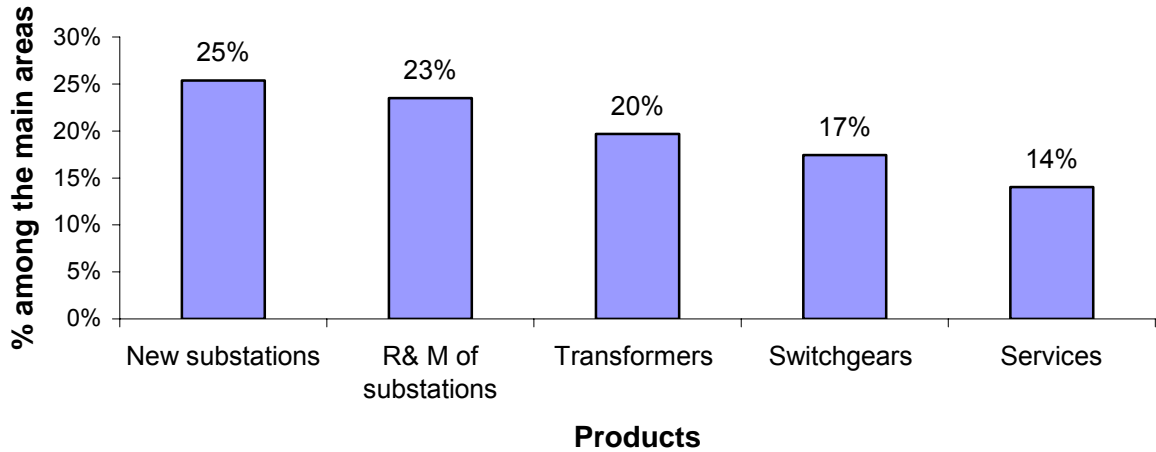
**5.6 Major Areas Of Growth**

**Question no. 38 Percentage of investments in the following areas of the total demand**

In order to reconfirm the future demand and investments, the respondents were asked to indicate the probability of the investments in the areas of new substations, R& M of substations, loose products like transformers and switchgear and other It enabled services. The customer considered that the investments in the New Substation and the R & M of substations are likely to be high. The services are likely to get the least importance at the current time.



**Fig. 4.1 : Estimated investment pattern in Electric Power Distribution**

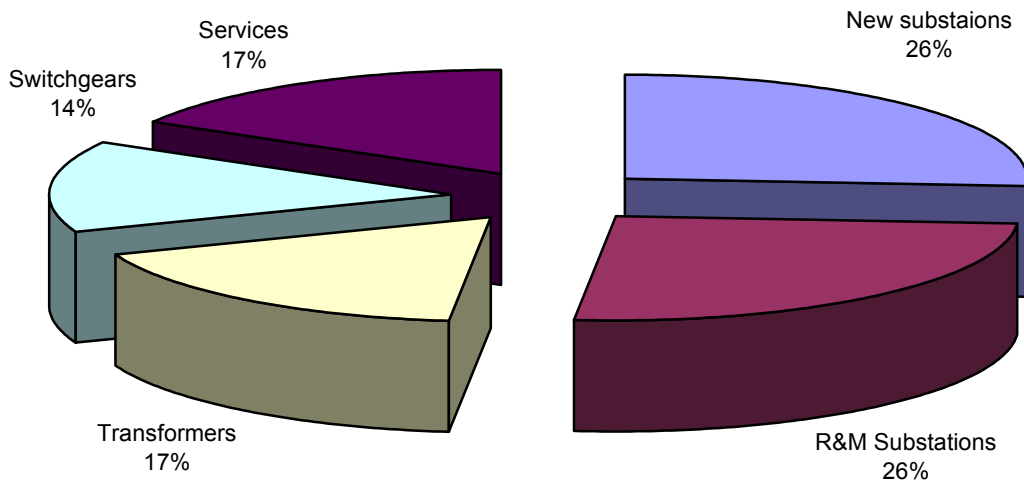


*Source : Response to Question no. 38 of the Questionnaire*

**Question no.40 Lucrative segments in terms of revenue and profit margins**

In order to reconfirm the future demand and investments, the respondents were asked to indicate the probability of the investments in the areas of new substations, R& M of substations, loose products like transformers and switchgear and other It enabled services. It was again observed that the new substations and the R & M of substations are the most preferred areas in terms of revenue and profits.

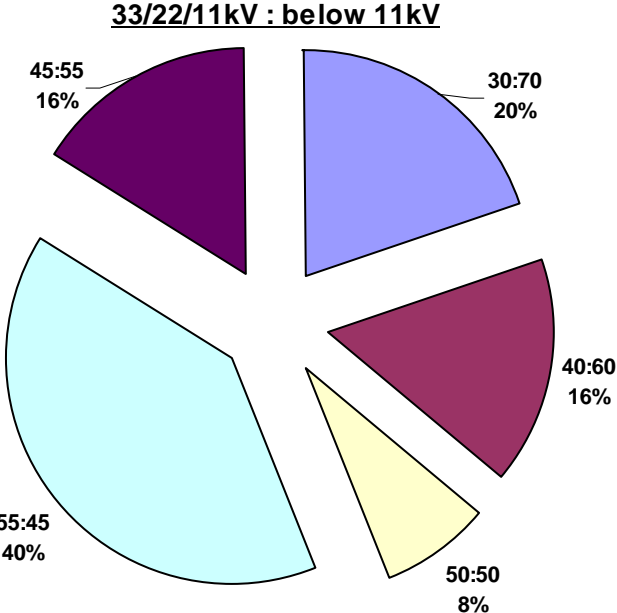
**Fig.5.15 Revenue realisation & Profit Margins**



*Source : Response to Question no.40 of the Questionnaire*

**Question no. 36** Data was also collected on the likely probability of kV Wise distribution of investments. The results indicate that majority of respondents have indicate an almost mixed type of investment pattern with a slight favour towards the above 11kV segment in the substation business. The results have been plotted below.

**Fig. 5.16 : Stages of deregulation as per Indian Electricity Act 2003**



Source : Response to Question no.39 of the Questionnaire

**5.7 Strategies For Major Equipment Manufacturers**

During the course of the research it has been established that the future is for equipment-based services. The trend of customers buying the equipment and then doing the erection and commissioning with in-house staff is not likely to continue for a longer period in the distribution business. The trend has already started showing results in the higher kV class or the transmission business wherein the projects divisions of ABB, ALSTOM & BHEL have outsmarted the substation and line contractors like Jyoti Structures, Techno Electric and others. *(Records of Project orders received / lost statements of BHEL)*

Thus in order to formulate the strategy for the Equipment manufacturers we try to understand the organization of the major equipment manufacturers in the distribution range. The main manufacturers are ABB, ALSTOM, SIEMENS, CGL and BHEL. The similarities between these are:

1. All these companies are **multi product** companies
2. These are **rich in technology** and have **best design capabilities** available in India.
3. These are **financially sound** and can invest money in the projects.
4. The **customers are** very much **familiar** with there products and have a **distinguished quality and brand image** for these compared to other small manufacturers.
5. All these organizations are **widely distributed** and have presence across all regions of the country.

However the difference between the above mentioned companies are:

1. BHEL being a PSU and a Navratna gets favours from the government buyers.
2. The procurement policy of the PSU companies is marred by strict rules and regulations and is governed by the CVC guidelines.
3. BHEL is also required to procure from small-scale industries under direct or indirect control of the government.
4. The salary and perks provided to the employees of the company are also governed by the central government rules that somehow create problem in rewarding the right candidates.

So in order to maintain a uniformity and greater acceptability of the marketing strategy the four private sector organizations are combined under one head for better acceptability of the recommendations.

The marketing strategy is identified using the following management tools:

1. SWOT ANALYSIS, TOWS MATRIX and Formulation of SO, WO, ST & WT Strategies
2. EFE MATRIX and IPE MATRIX
3. SPACE MATRIX ANALYSIS

The following marketing strategy needs to be adopted following the above analysis.

- ❖ Having a good combination of products, design capabilities and financial strength the companies should try to aggressively increase the presence in the distribution business and gain experience at the earliest.

- ❖ In the distribution segment the projects are much of smaller financial value so these do not invite purchase preference for the government organization like BHEL.
- ❖ Strong marketing efforts are required to throttle competition from the small contractors that have close proximity to the SEBs.
- ❖ Outsourcing of the products needs to be improved with back-to-back arrangement or long-term tie-ups with small component manufacturers.
- ❖ Use of good corporate image to form joint ventures to obtain synergistic advantage.
- ❖ Focus on the SEBs business, which is also growing due to investments under APDRP.
- ❖ To collectively attempt at improving payment terms and other factors through common bodies like IEEMA etc.

## **5.8 SWOT Analysis And TWOS Matrix**

Situation analysis begins the process of strategy formulation and requires an attempt to find a strategic fit between external opportunities and internal strengths while working around external threats and internal weaknesses. There is need to identify alternative ways that an organization can use its specific strengths to capitalize on opportunities or to avoid threats and to overcome its weaknesses. In order to prepare the TOWS matrix for the industry, the individual parameters are hereby listed.

### **Opportunities**

1. Huge investments leading to greater demand of goods and services.
2. Demand leading to industry operating at full & over capacity.
3. Better price realizations.
4. Early birds to learn faster and thus achieve repeat orders.
5. Formation of business groups and tie-ups for joint bidding.
6. Level playing field for private & public sector companies.
7. Healthier working environment and increased private sector participation in operation of distribution circles also.
8. Increased external commercial borrowings or ADB/WB funding leading to better payment options.

### **Threats**

1. Purchase preference may be extended to distribution sector.
2. Increased in no. of small contractors leading to price war.
3. Emergence of new players in the market like Schneider etc.

4. Increased Turnkey contracts may effect business of loose sales and also expose manufacturers to greater risk as EPC contractors.
5. Political pulls & pressures may jeopardize the whole process, raising alarm about privatization and being anti people.
6. The overall process of liberalization of power sector is moving at a much faster pace than the other contemporary countries. This pace could lead to a total breakdown of the system.

### ***Weakness***

1. The procurement process in the companies is cumbersome and subject to auditing.
2. Low exposure to the needs & dynamics of distribution business.
3. Role clarity on the requirement of being an equipment supplier or a solution provider.
4. Acceptance of customers to execute low value high volume jobs.

### ***Strengths***

1. Good corporate image.
2. Complete range of product for transmission & distribution.
3. Established brand name.
4. Considered to be having technology & design ability.
5. Strong & wide networks of manpower across India.

### ***Strategies to capitalize on strengths***

- ❖ Having a good brand image and product portfolio of these companies, they should aggressively defend and increase market share.
- ❖ Improve internal efficiency and productivity of the employees.

### ***Strategies to improve the weakness***

To increase the business to gain more experience and thus learning new ways of executing substations in lower range more efficiently.

- ❖ Improve the speed and quality of purchases as the competition in this range is with small contractors with low overheads.
- ❖ To create channel partners rather than to operate as individual companies.

**Table 5.1 : TOWS Matrix for the Distribution Equipment Manufacturers**

	<p style="text-align: center;"><b>STENGTHS</b></p> <ul style="list-style-type: none"> <li>▪ Good corporate image.</li> <li>▪ Complete range of product for transmission &amp; distribution.</li> <li>▪ Established brand name.</li> <li>▪ Considered to be having technology &amp; design ability.</li> <li>▪ Strong &amp; wide networks of manpower across India.</li> </ul>	<p style="text-align: center;"><b>WEAKNESSES</b></p> <ul style="list-style-type: none"> <li>▪ Lack of competitiveness. The procurement process in the companies is cumbersome and subject to auditing.</li> <li>▪ Low exposure to the needs &amp; dynamics of distribution business.</li> <li>▪ Role clarity on the requirement of being an equipment supplier or a solution provider.</li> <li>▪ Acceptance of customers to execute low value high volume jobs.</li> </ul>
<p style="text-align: center;"><b>OPPORTUNITIES</b></p> <ul style="list-style-type: none"> <li>▪ Huge investments leading to greater demand of goods and services.</li> <li>▪ Demand leading to industry operating at full &amp; over capacity.</li> <li>▪ Better price realizations.</li> <li>▪ Early birds to learn faster and thus achieve repeat orders.</li> <li>▪ Formation of business groups and tie-ups for joint bidding.</li> <li>▪ Level playing field for private &amp; public sector companies.</li> <li>▪ Healthier working environment and increased private sector participation in operation of distribution circles also.</li> </ul> <p>Increased external commercial borrowings or ADB/WB finding leading to better payment options.</p>	<p style="text-align: center;"><b>SO STRATEGIES</b></p> <ul style="list-style-type: none"> <li>▪ Increase market share aggressively.</li> <li>▪ Present a better way of performing the jobs in tune with the established brand name.</li> <li>▪ To address the demand in all the parts of the nation to gain wide spread experience and exploit the opportunities.</li> <li>▪ To offer design solution to the customer.</li> <li>▪ Invest money in the process to have financial advantage over small contractors.</li> </ul>	<p style="text-align: center;"><b>WO STRATEGIES</b></p> <ul style="list-style-type: none"> <li>▪ Improve procurement cycle and reduce the process difficulties.</li> <li>▪ Execute pilot projects to gain experience and minimize risks.</li> <li>▪ To have a dual role or organization structure to address the turnkey as well as loose equipment market.</li> </ul>

THREATS	ST STRATEGIES	WT STRATEGIES
<ul style="list-style-type: none"> <li>- Purchase preference may be extended to distribution sector.</li> <li>- Increased in no. of small contractors leading to price war.</li> <li>- Emergence of new players in the market like Schneider etc.</li> <li>- Increased Turnkey contracts may effect business of loose sales and also expose manufacturers to greater risk as EPC contractors.</li> <li>- Political pulls &amp; pressures may jeopardize the whole process, alarming it to be privatization and as anti people.</li> <li>- The overall process of liberalization of power sector is moving at a much faster pace than the other contemporary countries. This pace should not lead to a total breakage of the system.</li> </ul>	<ul style="list-style-type: none"> <li>▪ To increase lobbying with the government to prevent extension of purchase preference and maintaining level playing field in the segment.</li> <li>▪ To tie up with small contractors on business sharing arrangements to prevent price fall due to intense competition.</li> <li>▪ To check the emergence of new players and be well prepared to counter them.</li> <li>▪ To be cautious in the event of change in government and the process of reforms falling off the track.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reduce costs to increase margins.</li> <li>▪ To train manpower to counter the threats of enhanced competition and to execute the jobs efficiently.</li> <li>▪ Increase the acceptability in small jobs despite the preference for small contractors and PSUs.</li> </ul>

**SO, WO, ST and WT strategies listed above are for ALSTOM**

*Source : Market Intelligence reports of BHEL, Response to Questionnaire and personal interviews(see 1.4 & 1.5), Powerline & IEEMA journals listed in Chapters 1 to 4.*

## 5.9 EXTERNAL / INTERNAL FACTORS ASSESSMENT AND STRATEGIC POSITIONING

One way to establish the Strategic Position and actions to be taken is to list the external factors (EFE matrix) and the internal factors (IFE matrix) and then develop a SPACE Matrix (Strategic Positioning and Action Evaluation) which was developed by Rowe, Mason and Dickel (Strategic Management and Business Policy – a methodical approach, Addison Wesley 1982). It is a matching tool that indicates the general type of strategy an organisation should follow viz Aggressive, Conservative, Defensive or Competitive. The technique involves the production of a vector on a matrix where the X-axis represents net effect of Competitive Advantage (CA) and Industry Strength (IS) and Y-axis represents net effect of Financial Strength(FS) and Environment Stability.

The strategic position of Equipment Manufacturers as EPC contractors and strategies to be adopted for taking up of Turnkey Projects is depicted below using the EFE, IFE and SPACE Matrices.

**Table 5.2 External Factor Evaluation Matrix (EFE Matrix)**

Key External factors	Weights	Ratings	Weighted Score
<b>Opportunities</b>			
Huge investments leading to greater demand of goods and services.	0.1	2	0.2
Demand leading to industry operating at full & over capacity.	0.075	2	0.15
Better price realizations.	0.025	3	.075
Early birds to learn faster and thus achieve repeat orders.	0.1	2	0.2
Formation of business groups and tie-ups for joint bidding.	0.05	1	.05
Level playing field for private & public sector companies.	0.075	2	0.15
Healthier working environment and increased private sector participation in operation of distribution circles also.	0.075	2	0.15
Increased external commercial borrowings or ADB/WB finding leading to better payment options	0.025	2	.05



Threats	Weights	Ratings	Weighted Score
Purchase preference may be extended to distribution sector.	0.15	4	.06
Increased in no. of small contractors leading to price war.	0.075	3	0.225
Emergence of new players in the market like Schneider etc.	0.025	3	0.075
Increased Turnkey contracts may effect business of loose sales and also expose manufacturers to greater risk as EPC contractors.	0.025	2	0.5
Political pulls & pressures may jeopardize the whole process, alarming it to be privatization and as anti people.	0.1	2	0.2
The overall process of liberalization of power sector is moving at a much faster pace than the other contemporary countries. This pace should not lead to a total breakage of the system.	0.1	2	0.2
TOTAL	1		2.285

The ratings are as follows

- 1 The response is superior
- 2 The response is above average
- 3 The response is average
- 4 The response is poor

*Source : Market Intelligence reports of BHEL, Response to Questionnaire and personal interviews (see 1.4 & 1.5), Powerline & IEEMA journals listed in Chapters 1 to 4.*

**Comments:**

**The score of 2.285 indicates that the equipment manufacturers are just above average in their efforts to pursue strategies that capitalize on external opportunities and avoid threats.**

**Table 5.3 Internal Factor Evaluation Matrix (IFE Matrix)**

<u>Key Internal Factors</u>	Weights	Rating	Weighted Score
<b><u>Strengths</u></b>			
Good corporate image.	0.05	3	0.15
Complete range of product for transmission & distribution.	0.25	4	1
Established brand name.	0.05	4	0.2
Considered to be having technology & design ability.	0.2	3	0.6
Strong & wide networks of manpower across India.	0.025	4	0.01
<b><u>Weakness</u></b>			
The procurement process in the companies is cumbersome and subject to auditing.	0.1	1	0.1
Low exposure to the needs & dynamics of distribution business.	0.15	1	0.15
Role clarity on the requirement of being an equipment supplier or a solution provider.	0.125	2	0.25
Acceptance of customers to execute low value high volume jobs.	0.05	2	0.1
TOTAL	1		2.56

Source : Market Intelligence reports of BHEL, Response to Questionnaire and personal interviews (see 1.4 & 1.5), Powerline & IEEMA journals listed in Chapters 1 to 4.

The ratings are as follows

- 1 A major weakness
- 2 A minor weakness
- 3 A minor strength
- 4 A major strength

**Comments:**

The score of 2.56 indicates that the equipment manufacturers are above average in their overall internal strategic position. However, the different companies need to do the IFE separately.

**Table 5.4 SPACE Matrix of ALSTOM T&D Projects**

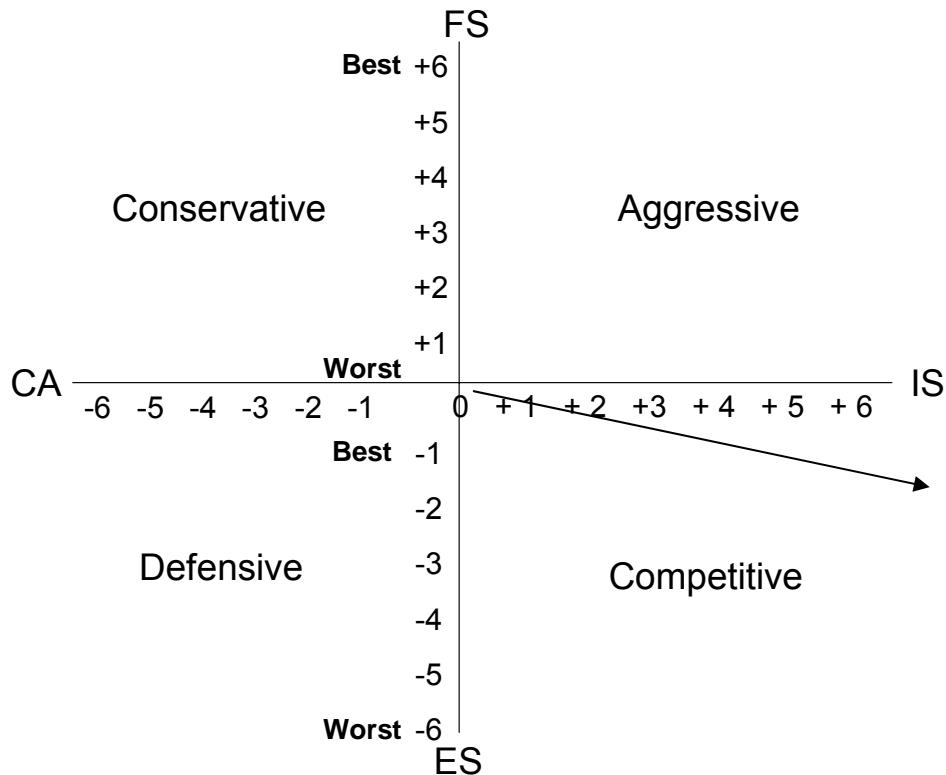
<b>Internal Strategic Position</b>	<b>Rating</b>	<b>External Strategic Position</b>	<b>Rating</b>
Financial Strength (FS)		Environmental Stability (ES)	
- Operating Margin	3	- Technology changes	-4
- Return of investment	3	- Rate of inflation	-2
- Leverage	2	- Demand variability	-3
- Liquidity	5	- Price range of competitive products	-6
- Working Capital	5	- Barrier to entry into market	-2
- Cash Flow	4	- Competitive pressure	-4
- Ease of exit from business	1	- Price elasticity of demand	-5
- Risk involved in business	5	- Consumption pattern	-4
<b>Average</b>	3.11	<b>Average</b>	-3.33
<b>Competitive Advantage (CA)</b>	<b>Rating</b>	<b>Industry Strength (IS)</b>	<b>Rating</b>
- New product development	-5	- Growth potential	6
- Market Share	-6	- Profit potential	3
- Product Quality	-2	- Financial stability	4
- Product life cycle	-4	- Technological know how	6
- Customer loyalty	-5	- Resource utilization	4
- Technological know how	-1	- Capital intensity	4
- Control over supplier and distributor	-4	- Ease of entry into market	3
- Vertical integration	-2	- Productivity, capacity utilization	2
<b>Average</b>	-3.22	<b>Average</b>	3.56

**Directional vector:**

**X axis: -  $-3.22+3.56= 0.340$**

**Y axis: -  $3.11+(-3.33) = -0.220$**

**Fig. 5.17 : SPACE Matrix**



*Source : Market Intelligence reports of BHEL, Response to Questionnaire and personal interviews(see 1.4 & 1.5), Powerline & IEEMA journals listed in Chapters 1 to 4.*

**Comments:**

The Equipment manufacturers should follow the **competitive strategy**. It has strong internal strengths, which should be used to take advantage of the external opportunities. The equipment manufacturing companies should go for

1. Joint ventures
2. Market Penetration
3. Market Development
4. Concentric diversification
5. Horizontal Integration
6. Price Competitiveness
7. Better procurement of distribution products

## **Chapter 6 - Conclusion**

### **6.1 Recommendations**

The study and the analysis of the data gives an insight of the requisite marketing strategy for the equipment manufacturers. Thus in order to get considerable and profitable share in the increasingly competitive market, we need greater emphasis on the following areas:

- Increasing market share – Aim to increase penetration.
- Price Competitiveness – to meet the levels of the small contractors
- Brand building exercise –To gain customers confidence in the distribution business also.

The above can be achieved through

1. **Greater participation** in the distribution business for execution of turnkey substations.
2. **Pre tendering activities** to help customers developing specifications calling for superior quality products.
3. Increased level of **public relations** with the customer especially for the distribution business through **dedicated Marketing & sales team**.
4. Helping the customer by **conducting system studies** and advocating the right equipment at the right place.
5. Improving the **flow of information and speed of response** towards the customer.
6. **Competitive prices and delivery** schedules, to meet the levels of small EPC contractors.
7. **Cost cutting exercise** within the organization to improve realizations.
8. **Awareness** about the **market development** and **competitor strategies**.
9. **Innovating ideas** like life enhancement of old equipments, retrofitting old equipments etc. This will help in increasing the customer's confidence.

### **6.2 Key Issues & Concerns**

#### **Business Environment**

1. SEBs delayed their procurement on account of financial crunch. It was observed that all the SEBs was postponing or avoiding the investments required in the distribution sector due lacking of funds. This trend prevailed for

a longer period leading to high T&D losses due to deterioration of the distribution network.

2. The greater numbers of small-scale contractors with deep roots in the SEBs pose competitive threat. All SEBs had a preferred list of contractors, which were availing special benefits due to proximity to the customer. These contractors posed a major threat to the manufacturers who our planning to enter the distribution business.
3. The preference for BHEL and other PSUs, which is evident in the transmission sector, may also converge in the distribution sector.

### **Buying behaviour**

4. The customers are not yet willing to upgrade the system from manual to IT enabled thus depriving the companies likes ABB, ALSTOM and Siemens to use their relays, which contribute a major portion in the SCADA implementation. This is mainly because of the uncertainty prevailing in the mind of the customer regarding the long-term implementation of the programme.
5. The effect of reform process on the procurement pattern is very less. This may jeopardize the efforts undertaken by the companies to introduce better technology and innovative execution techniques.
6. The speed of the opening up of the distribution network in India is much faster than the similar processes held in the comparable nations. This is raising doubts about the sustenance of this speed in the long run.
7. The political stability in country will be contributing a lot. A change in govt. may lead to change in governmental policies.

### **Demand Estimation**

8. The demand estimation process is indicating huge potential in the coming year. However, various assumptions regarding economic and political stability of the country were considered during the process. Any change in these factors may lead to unforeseen implications on the process.
9. The preparedness of the companies to address the distribution business is also a big question. As per the latest estimates and market reports almost all the major organizations are operating at optimum capacities and may not be in a position to take further load without major structural changes.
10. The distribution business is a high volume business with comparatively less margins as compared to the transmission business. The companies are not yet prepared to take up this high volume business.

## **Competition**

11. Scope of the report considers the competition mainly from the equipment manufacturer and electrical contractors. It is expected that there may be rise in competition from the players in these segments.
12. In a recent case civil contractor with no prior experience in substations has quoted for 33/11 kV substations. The continuation of this trend on large scale may completely change the total scenario.

## **6.3 Actions To Be Initiated**

Efforts required for improving business

1. **Spec-in Activities:** This involves the customer education programme on the latest trends and technologies. The customer need to be apprised of these trends and advocated on including these in the tender specifications.
2. **Approvals:** The supplier need to get the desired make approved from the customers and also make the necessary changes in the commercial terms and conditions of the contract.
3. **Identifying major projects:** The companies need to identify major projects on the basis of revenue generation and ease of execution of the contracts.
4. **Retrofit business:** The companies need to use the design capabilities in capturing the retrofit business. This will not only provide benefits to the customer but also prove the design capabilities of the companies. This will help the companies in future to get business from the customers with favorable conditions.
5. **Prequalification actions:** In this process, the customers need to be approached to include certain pre qualification parameters on the health of the organizations in financial terms and the experience.
6. **Documentations:** The companies need to improve the documentation process enabling ease of flow of information within the company. This will help in improving the operations of the company and smooth change over in the event of change in ownership of projects within the company.
7. **Exhibitions/Seminars/ Public Relations/ Local Advertisings:** The companies need to improve the public presence in terms of the exhibitions and

seminars and make the customers aware about their intentions to be major player in the distribution business.

8. **Indirect Business**- coordinating with the network to regularly follow up with the consultants, SEBs, Power Generation Authorities, Major industrial groups.

## **6.4 Means Required for Improving Business**

1. **Training plan for the executives to deal with high volume jobs.** As per the current business models the companies are executing low volume high margins jobs, which require dealing with less no. of customers and limited sites. Thus to improve the efficiency of the executives, the executives need to be trained to handle such jobs.
2. **Training of the personal in general management.** In the distribution business the aspects of general management also increase to great extents and this requires people to deal with these parameters. Thus training programme in this regard are also required.
3. **Site management:** The people need to be trained to handle site conditions, as with the increase in volume of business and large number of sites, more people will be required to manage the sites.
4. **Overseas Training:** Though the site condition and the working environment in different countries are different but the exposure to different working environments lead to generation of new ideas regarding contract execution. Thus senior people and site managers may be given on site training in different countries. This is only possible with the MNCs like ALSTOM, ABB etc who have numerous sites across the globe.
5. **Develop manpower** in multi product applications/ application engineering through factory and product training.
6. **Strengthening network:** Though these companies are having a well-established distribution and marketing network but there are certain lapses, which increase the response time to the customer. Thus these factors need to be improved to offer the best possible services to the customers.



7. **Improvement in procurement of bought out equipments.** The procurement process of these companies is marred by almost all the problems that a SEBs or a large organization faces. These need to be improved upon by considering global markets to procure the items.

## ***6.5 Infrastructure / Tools***

1. Better communication facilities among the executives.
2. Data management tools and software packages to keep track of the changes in the prices of the raw material.

## ***6.6 Procurement & Business Tie-Ups***

1. In order to address the business effectively the organizations need to have long terms tie-ups with small vendors.
2. The vendors list needs to be updated on the performance and price parameters and also on the requirement and perception of the final customer.
3. The companies need to formulate business-sharing arrangements to minimize the competition and improve realizations.

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## **ANNEXURE I**

### **QUESTIONNAIRE DESIGN AND SURVEY DETAILS**

The questionnaire has been designed in such a way so to get the exact viewpoint of the customer about the shift towards turnkey concept. The questionnaire also aims to establish the buying pattern of the customer. It is designed with close-ended questions only.

While designing the questionnaire, a wide range of parameters and the variety of customers have been given due considerations. The various customers have specific requirement and expectation. The questions have tried to probe the various clients on the basis of factors influencing purchase and satisfaction.

The questionnaire also tries to explore the respondent about organizational changes/buying behaviour changes in response to the power sector reforms and increased level of procurement.

The questions have been mostly objective with multiple options. The respondents have been asked to rate the various companies giving due consideration to the factors influencing buying behaviour. They have also been asked to rate the various characteristics on the basis of importance and weight age given in the decision process.

Some questions have been designed so as to obtain relevant information of the profile and nature of the company so that the responses can be categorized and effectively analyzed.

The sample questionnaire was given pilot testing on few customers. The response obtained enabled this researcher do modification so as to get more effective responses.

#### **The features of the questionnaire so designed are**

- The purpose has been clearly and briefly specified at the beginning. Attempt has been made to obtain unbiased and useful responses.
- The questions pertaining to specific customers have been clearly indicated so as to avoid wastage of time of the respondents.
- The respondents have been asked to rate their priority and responses.
- The questionnaire is neither length nor time consuming, but at the same time it enables to extract the required information.

The questionnaire was segregated into five segments involving:

- General Information
- Buying Behaviour
- Effect of Reforms on Buying Behaviour
- Competition & Customers Preference.
- Demand Estimation

The first segment of the questionnaire was aimed at the general information from the respondents to get the idea of the organization in which they are working. Also the first objective was achieved through scanning of the reports from the Ministry of power and the reports published by various organizations like Power line, IEEMA, electrical India, and CPRI etc.

The second objective was to understand the buying behaviour of the customers in the pre reform era. The questions provided an insight to

- Buying pattern
- Project Funding
- Route to purchase i.e. through tenders or direct purchase from OEMs
- Decision time taken
- Payment terms of the tenders
- Buyer selection procedure

In the third segment the data was invited to understand the changes in the above parameters mentioned in point 2 along with the likely affect of the reforms on the organization structures and growth areas. The respondents were required to identify the change in the competition level and also the shift towards the turnkey concept.

The next segment tries to get results for the objective related to competitive environment and the marketing element among the equipment manufacturers as seen from the customers perspective.

- Questions 28 to 36 are dedicated to get the response towards the fulfillment of the objective. In this questions range from familiarity of the products to the ratings of various attributes like quality, price, after sales service, delivery and brand image were probed.
- The question no.35 aims to get responses from the respondents upon the various key factors required for the efficient execution of the turnkey contracts. The factors considered in this regard are In-



house capabilities, design ability, financial strength, experience and efficient procurement.

- The question No. 36 attempts at getting the customers response towards a preference towards the organization that is best suited to execute the turnkey substation in the distribution sector.

The last segment of question from Question no. 37 to 40 try to get the response from the respondents about the actual demand finalization and the segments that they feel are more lucrative. Similar data can be achieved from the secondary sources available in the form of the published information. This data was used to compare the actual feelings of the respondents to the data collected from the secondary sources.

The research was conducted on a sample size of 25 respondents. Though the sample size appears small it covered the entire gamut of customers, consultants, contractors, planners, Pvt. Players etc. and varied widely across the country with diverse views & levels of performances. The sampling process considered to interview / get the response from at least one respondent from each customer segment in the electric power distribution sector to ascertain objectives. The samples had not been drawn at random but chosen such that the samples are involved in this type of business activity and are aware of the various facets of turnkey concept to give correct opinion about it. The study was conducted through marketing officials of BHEL of Regional Operations Division (ROD) located all over India, who could explain the need of correct answers to the respondents. The same was also verified by the personal interview conducted by a parallel person in the same customer segment. The respondents were mainly from the purchase and the operations department of the customers. Five samples were drawn from each customer segment i.e. SEBs, Utilities, IPPs, Consultants and Contractors. In sampling special emphasis have been given to SEBs, which are more progressive like HVPNL, PSEB, DVB, APDISCOMS, and KPDISCOMS & MPSEB. The personal interviews were conducted with respondents from CEA, PGCIL, BHEL, ABB and ALSTOM. This ensured a great variation in terms of respondent that included actual customers, policy makers and major suppliers. Guidance was also taken from friends in consultants like Mckinsey etc. who provided the viewpoint of senior executives of various industries.

The scope of this research being too broad and highly debatable due to lack of clarity among all the customers, personal interviews were also conducted with certain important persons in the business arena. These were not only the customers abut also policy makers who provided an overall and broad spectrum of possibilities which can happen in the power

distribution business especially related to the “Concept of total solution provider”.

The personal interviews conducted with customers focused on the following:

Effect of reforms on the buying behaviour

Customers preference about competitors

Demand Estimation

The data obtained from the questionnaire and the study of the business environment has been segregated as per the objective of the report and Chapter 5 (ANALYSIS) provides insights to the findings of the study.

## **ANNEXURE - II**

### **SAMPLE QUESTIONNAIRE**

#### **General Information**

1. Sector to which your organization belongs
  - Government
  - Semi Government
  - Industrial sector
  - Private
  
2. To which forms your business fits in
  - Electricity Board
  - Electricity utility
  - Consultancy
  - Contractor
  - IPP
  
3. What is your line of activity in electrical industry
  - Transmission
  - Distribution
  - Generation
  - Independent power Producer
  - Any other please specify
  
4. In case of Electricity Board, you deal with
  - Purchase from any manufacturer of electricity equipments
  - Purchase from manufacturer of some low voltage electricity equipments
  - Purchase from manufacturer of some high voltage electricity equipments
  - Purchase from large manufacturer of major electrical equipments only
  - Any other please specify
  
5. In case of utility, your profile
  - Large utility for mega projects
  - Utility for mid-size projects
  - Utility for small size projects
  - Any other please specify
  
6. In case of IPP, your profile
  - Large IPP for mega projects
  - IPP for mid-size projects
  - IPP for small size projects
  - Any other please specify

7. In case of consultant, your profile

- Large consultant for mega projects
- Consultants to medium scale industries
- Consultant to small scale industries
- Consultant to government organization
- Any other please specify

8. Type of electrical equipment usually required/dealt by you

- Transformers
- Switchgears
- Isolators
- Control and relay panels
- Any other please specify

9. In what voltage class is the future business from reforms expected?

- Up to 11kV
- Up to 33kV
- Up to 132kV
- Up to 220kV
- Above 220kV

10. Electrical Equipment manufacturers you are familiar with

- Crompton Greaves Ltd. (CGL)
- Bharat Heavy Electricals Ltd. (BHEL)
- Alstom
- Kirloskar
- Siemens
- Asea Brown Boveri (ABB)
- Electric Manufacturing Company (EMCO)
- Any other, please specify

### **Buying Behaviour**

11. How do you route your purchases?

	Always	Mostly	Very often	Some times	Never
Tender notification through press					
Direct purchases through OEMs					
Involve consultants					
Give turnkey jobs to contractors					
Any other, please specify					

12. How do you finance your purchases?

	Always	Mostly	Very often	Some times	Never
External Commercial Borrowings					
World Bank/ADB/OECF funded					
Own Finances					
Financial Institutions in India like IDBI, PFC etc.					
Any other please specify					

13. Your purchase methodology

	Always	Mostly	Very often	Some times	Never
Stand-alone equipment only					
Turnkey basis only					
Both as per need					
Any other, please specify					

14. Decision time for purchase finalization

- Less than 3 months
- Between 3 to 6 months
- Between 6 to 12 months
- Greater than 12 months
- Any other, please specify

15. Your Standard terms of payments

	Always	Mostly	Very often	Some times	Never
Allow for release of advance payments					
Pro-rata release as per supplies					
Through Letter of Credit					
Through Banks/Financial Institutions (IDBI etc)					
Any other, please specify					

16. What is your buyer selection procedure?

	Always	Mostly	Very often	Some times	Never
Tenders, selection on basis of prices					
Tenders, selection after negotiations					
Negotiations with the short listed manufacturers					
Distributive buying from more than one party					
Any other, please specify					

17. What is your buying pattern/frequency

- Annually
- As and when required
- Once in two years
- Any other please specify

18. What is your vendor selection procedure?

- As per Pre-Qualification
- Past experience of supplies given to you
- Reference list of the vendor
- Vendor registration procedure
- Brand image

**Effect of Reforms on buying behaviour**

19. Likely impact of APDRP projects in the region

	Very High	High	Medium	Low	Negligible
Growth in all the areas					
Special emphasis on enhancement of distribution capacity at 33/11kV					
R & M of existing substations					
Implementation of SCADA in distribution					

20. Impact of Power distribution reforms on organization structures

	Very High	High	Medium	Low	Negligible
Greater accountability					
Thin organization structures					
Change in procurement methods					
All of the above					
Any other as per information					

21. Impact of APDRP and reforms program on demand of new products and services

- Increased procurement of independent products
- Increased Turnkey contracts
- No effect on any of the above
- Increase in demand for new product and features like SCADA, GIS mapping, Billing services

22. Type of funding being used for new contacts after unbundling of SEBs

- Own Funds of SEBs
- World Bank or ADB Funding
- Central Assistance or funds from PFC & REC.
- Specify if any other

23. Competition level after reforms in the distribution sector

- No change
- Increased competition from contactors
- Increased participation in turnkey contacts by equipment manufacturers
- Emergence of new players in this field.

24. What do you feel are key products required in the distribution substation?

	1	2	3	4	5
Transformer					
Switchgear					
Control Panel					
Energy Metering					
SCADA Solution					
Capacitors					

25. The following questions deal with turnkey purchase concept. Answer the questions in the following mode

Question	Strongly Agree (1)	Agree (2)	Neutral (3)	Dis-agree (4)	Strongly Disagree (5)
a) The turnkey method of purchase is better than traditional method.					
b) Time consumed is high					
c) Risk involved is high					
d) It does not require marketing efforts					
e) It calls for lesser coordination					
f) It leads to decreased competition					
g) It leads to lot of conflicts					
h) It calls for lot of expertise with customer and vendor					
i) It brings out the best quality of installation.					
j) It leads to timely execution					
k) It instills more confidence in the purchaser					
l) It is more efficiently managed					
m) Profits as a %age of sale increases					
n) After sales service is better and faster.					

### **Customers Preference and competition**

26. Companies with which you have executed business

- Crompton Greaves Ltd. (CGL)
- Bharat Heavy Electricals Ltd. (BHEL)
- Alstom
- Larsen & Toubro (L & T)
- Siemens
- Asea Brown Boveri (ABB)
- Any other, please specify

27. Your rating of various attributes of products

	1	2	3	4	5
Quality					
Price					
Delivery					
After sales image					
Brand Image					



28. Your rating of the following companies in terms of quality

	1	2	3	4	5
CGL					
BHEL					
ABB					
ALSTOM					
SIEMENS					

29. Your rating of the following companies in terms of price

	1	2	3	4	5
CGL					
BHEL					
ABB					
ALSTOM					
SIEMENS					

30. Your rating of the following companies in terms of deliveries

	1	2	3	4	5
CGL					
BHEL					
ABB					
ALSTOM					
SIEMENS					

31. Your rating in terms of after sales service/response time

	1	2	3	4	5
CGL					
BHEL					
ABB					
ALSTOM					
SIEMENS					

32. What had been the response time of the suppliers dealt by you?

- Immediate
- Within a fortnight
- Within a month
- After a month

33. Your rating of various suppliers Brand Image amongst themselves

	1	2	3	4	5
CGL					
BHEL					
ABB					
ALSTOM					
SIEMENS					

34. What should be the attribute for efficient offer sales service

- Timely response
- Adequate service staff
- Warranties
- Any other

35. How do you rate the key factors required for the execution of distribution substations?

	1	2	3	4	5
In-house products					
Design Capabilities					
Financial Strength					
Experience					
Efficient Procurement					

36. According to you, which of the following are in a better position to execute a distribution substation?

- Transformer Manufacturers viz. Andrew yule, Emco,
- Switchgear Manufacturers viz. ABB, Siemens, Alston, CGL, BHEL
- Contractors viz. L&T, Jyoti Structures, Techno
- SEBs

**Demand Estimation**

37. Total demand expected in the distribution business in the next 5 years

- 1000 Crs
- 2000 Crs
- 3000 Crs.
- 5000 Crs
- 7000 Crs and above

38. Percentage of investments in the following areas of the total demand

	High Probability	Medium Probability	Low Probability
New Substations			
R & M of Substations			
Transformers			
Switchgears			
Services			
Others			

39. Likely distribution of demand between the following voltage categories

33/22/11kV Range	30	40	50	55	45
Below 11kV	70	60	50	45	55

40. Lucrative segments in terms of revenue and profit margins

	Very high	High	Medium	Low	Very Low
New Substations					
R & M of Substations					
Transformers					
Switchgears					
Services					
Others					
33/22/11kV Range					
Below 11kV					