Case Study on

Gujarat Electricity Board – A Benchmark in the progress of SEB reforms.

Conceptualized and Written By:

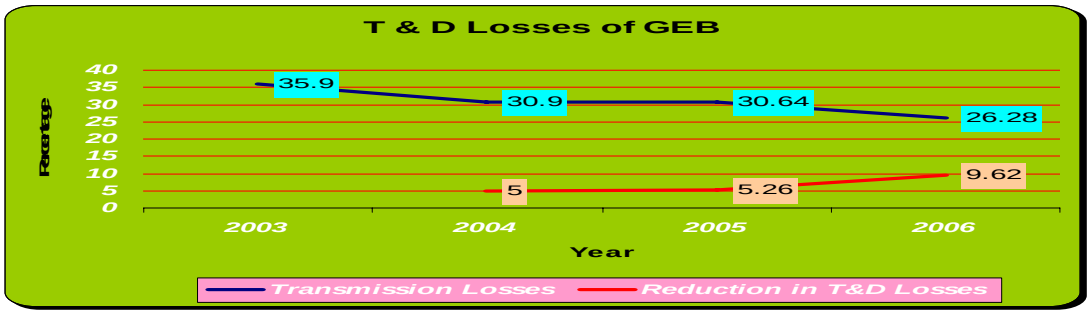
Mr. Tarak Shah

Indian Institute of Planning and Management (IIPM)
Ahmedabad

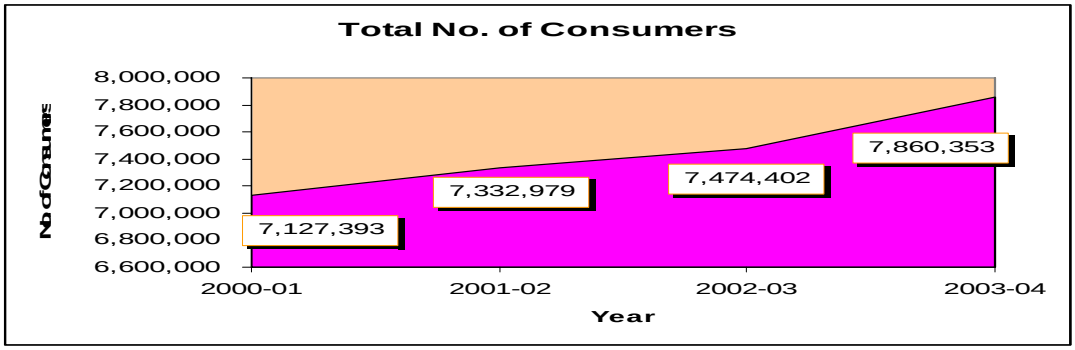
GUJARAT ELECTRICITY BOARD

Gujarat Electricity Board's efficiency has remained a prime concern for Government of Gujarat since its commencement. Under the overall leadership of Hon. Chief Minister of Gujarat, Mr. Narendra Modi and Hon. Minister of State Energy, Petrochemicals, Planning and Control, Mr. Saurabh Patel, and with active support of officials right from the M.D. to common linemen of GEB, the entity transformation from heavy losses to the healthy profits. Just to reinforce…….

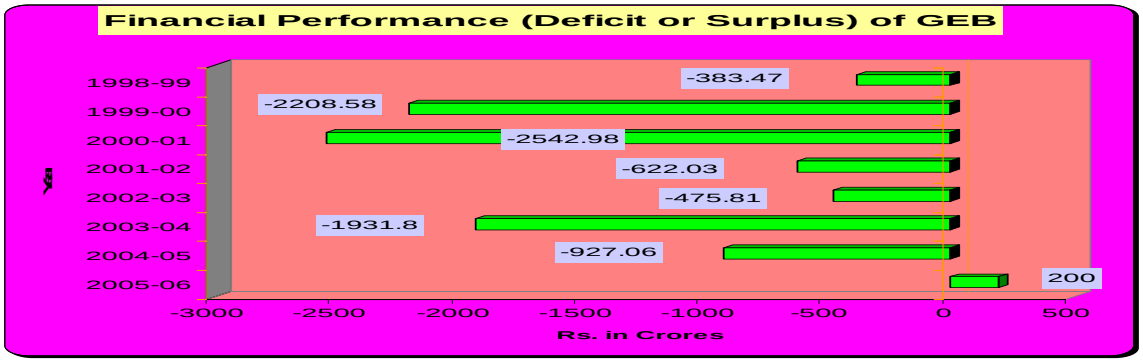
Reduction of T & D Losses of GEB with greater intensity year by year



Increase in total no. of consumers served by GEB due to passionate rural electrification programme



Improvement in Financial Performance of GEB



A Case Study conceived and prepared by Indian Institute of Planning and Management (IIPM), Ahmedabad on "Gujarat Electricity Board – a historical transformation in the domain of public sector in India" is enclosed for your perusal.

ABBREVIATIONS

ABT	Availability Based Tariff
APDRP	Accelerated Power Development & Reforms Programme
AT&C	Aggregate Technical & Commercial Losses
CAGR	Compound Annual Growth Rate
CEA	Central Electricity Authority
CEO	Chief Executive Officer
CERC	Central Electricity Regulatory Commission
CKM	Circuit per Kilo Meters
CPP	Captive Power Producers
CPSU	Central Public Sector Undertakings
DGVCL	Dakshin Gujarat Vij Company Ltd
DSCVO	Director of Security & Chief Vigilance Officer
DT	Distribution Transformers
EFC	Eleventh Finance Commission
ERP	Enterprise Resource Planning
FRP	Financial Restructuring Plan
GEB	Gujarat Electricity Board
GERC	Gujarat Electricity Regulatory Commission
GETCO	Gujarat Energy Transmission Corporation Limited
GIS	Geographical Information System
GSECL	Gujarat State Electricity Corporation Limited
GUVNL	Gujarat Urja Vikas Nigam Ltd
HT	High Tension
IEGC	Indian Electricity Grid Code
IPP	Independent Power Producers
JE	Junior Engineer
JGY	Jyoti Gram Yojana
KPI	Key Performance Indicators
KV	Kilovolts

KWH	Kilo Watt Hour
LT	Low Tension
MGVCL	Madhay Gujarat Vij Company Ltd
MMB	Metal Meter Box
MOA	Memorandum of Agreement
MOEF	Ministry of Environment and Forest
MOU	Memorandum of Understanding
MW	Mega Watt
NHPC	National Hydro Power Corporation
NTPC	National Thermal Power Corporation
PFC	Power Finance Corporation
PGVCL	Paschim Gujarat Vij Company Ltd
PLF	Plant Load Factor
REC	Rural Electrification Corporation Ltd
RMU	Ring Main Unit
SBU	Strategic Business Unit
SEB	State Electricity Board
SERC	State Electricity Regulatory Commission
SOE	State Operated Enterprises
T&D	Transmission & Distribution
TCS	Tata Consultancy Service
UGVCL	Uttar Gujarat Vij Company Ltd
WAN	Wide Area Network
XLP	Cross(X) Linked Polyethylene

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Gujarat Electricity Board – A Benchmark in the progress of State Electricity Board (SEB) reforms.[1]

"You can If and only if you will"

Almost everybody had lost faith when it came to make a transformation of an entity, which was in deep trouble over last seven years. In spite of all the travails, the entity was not anything to write off so easily. The investments were not just peanuts to forget fast! The lives that were depended upon it couldn't just be ignored. The entity had been illuminating each and every house and industrial establishment in the entire state of Gujarat except Ahmedabad and Surat. It had been virtually giving a lifeline to nearly 40 million customers by of generating, transmitting and distributing electricity! Not a small market to cater to under any scale.

The entity was none other than Gujarat Electricity Board (GEB), an organization consisting of nearly 50000 employees and bearing investments of billions of Rupees. GEB ran into huge losses over almost seven years denting the image of public sector in Gujarat. No rays of hope were seen until the financial year 2000-01, when an initiative by the Government of Gujarat led by visionary politicians, proficient administrators and diligent employees took everyone by surprise. A major reformation were which included unheard of strategies and tactics to unbundled the board, renegotiation of power purchase agreements (PPA), reduction of interest rates on loans, curbing of power theft and reduction of huge transmission and distribution (T&D) losses without experimenting with the quality of fuel.

The change leaders rest their hands on various hopes and they took the last five years to build a transformation story which could easily find its space among the brightest history of business. Gujarat Electricity Board was turned around from making heavy losses to making healthy profits. This was done without raising power tariffs in spite of continual increase in the cost of railway freight, coal and gas prices. Did the change agents play a trick or two out of the sorcerer's bag? No, they just did two very simple things, which ordinary companies somehow forget to do, rightly. They increased revenues with a vengeance and cut costs with the passion of an entrepreneur. Just these two things, would one say? So, where's the big story? What's there to learn? There are, in fact, plenty to learn.

[1] Case is conceptualized and written by, IIPM Ahmedabad. Cases are developed solely for the purpose of classroom discussions. They do not serve as endorsements, sources primary data or illustrations of effective or ineffective decision-making by corporate executives.

HISTORY OF GEB[2]

Gujarat Electricity Board (GEB) was established along with the formation of Gujarat State in the year 1960 under Section 5 of the Electricity (Supply) Act 1948. Commencing with generation capacity of 315 MW and a consumer base of 1.40 million consumers, GEB today is the lifeline of over 7.3 million consumers across the State of Gujarat.

During 1970s and 80s, the major thrust was on the supply of electricity in the rural areas. It was largely due to GEB's unwavering focus on rural electrification that Gujarat became the first state to achieve the landmark of '100% Electrification of Villages'. As per the 1991 Census, 17,940 out of 18,028 villages have been electrified – which is notified as close to 100%.

GEB continues to focus on its key objectives concerning generation, transmission and equitable distribution of power to achieve an all-round economic growth of the State. Till date it has installed 1, 72,662 (as on 31-03-2003) transformer centers and since four decades its per capita consumption has increased from 48 KWH (In 1960) to 932 KWH (as on 31-03-2003).

For the development of rural areas throughout state, GEB's holistic Rural Electrification Programme covers electrification of new villages, conversion of electrified villages from conventional method to Solar System and supply power to pump sets, Petaparas (Hamlets) and Harijan Bastis by availing finance mainly from REC., New Delhi and State Government.

GEB stands committed to build Gujarat as the largest power hub of the nation. With equal emphasis on serving both- the urban as well as the rural populace, it ensures a harmonious and a balanced growth of the economy by achieving its twin goals of social up-liftment of people as well as economic regeneration in the State.

[2] http://www.gseb.com/aboutus01.htm

OPERATIONS OF GEB[3]

Generation

GEB and GSECL, a company owned by GEB, contributes to 57% of the total installed capacity of the state grid. The remaining 43% comprises of Central Sector, Ahmedabad Electricity Company and Independent Power Producers.

Transmission

The state grid comprises of 400 KV, 220 KV, 132 KV and 66 KV transmission and sub-transmission lines.

The transmission department constructs, operates and maintains transmission lines and substations for transmission of bulk power generated at various generating stations as well as the state's share of power received from the central government's generating plants and IPP to various parts of the state through this network.

The network is managed by 10 transmission circle offices and 59 division offices (TR Division - 47 + Construction Division - 12)

Distribution

The distribution of power to the end user is one of the most critical functions of GEB. Electricity is distributed to 8 million consumers through 1,45,000 Circuit Kilometer (ckm) of HT lines, 2,06,000 ckm of LT lines and with the help of 2,30,000 transformers.

The distribution department is responsible for supply of power to residential areas, commercial complexes, streetlights, water works, agriculture and irrigation sector as well as various industries.

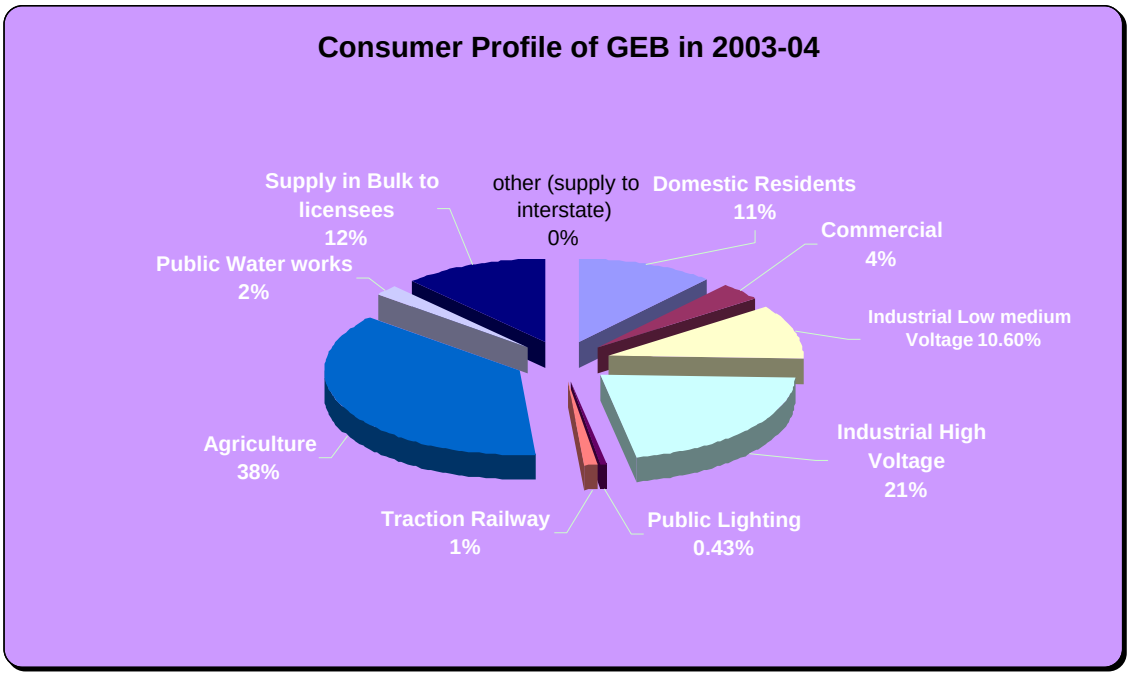
The consumer grievances cell functions under the distribution department. This cell resolves complaints of consumers and provides guidance as and when required.

[3] http://www.gseb.com/aboutus03_01.htm

CONSUMER PROFILE OF GEB

Consumer profile of Gujarat Electricity Board is much diversified. In the financial year, 2003-04 the company had sold 31001 MW of electricity to the consumers. As per **figure – 1,** 38 % of the total sales were part of agricultural customers whereas high voltage industrial house had consumed 21 % as compared to 10.60 % consumed by industrial houses that required low medium voltage. Total consumption of domestic residents was about 11 % while 4% of the total electricity sold was being used by commercial segment. Major chunk of electricity around 12 % was supplied in bulk to the licensees. And lastly, 1% was used by railway, 0.43% was used for public lighting and nearly 0. 02 % electricity was supplied for inter state consumption. (Refer Table- 1 for total electricity sold out to different types of customers)

Figure - 1 Consumer Profile of Gujarat Electricity Board (In terms of total sales) in FY 2003-04



(Adapted from Administrative Annual Report of Gujarat Electricity Board FY 2003-04)

Table - 1 Details of category wise sales of energy to different types of consumers in Gujarat

(Adapted from Administrative Annual Report of Gujarat Electricity Board FY 2003-04)

Sr. No.	Types of Customers	Units Sold (MW)
1	Domestic Residents	3523
2	Commercial	1114
3	Industrial (Low & Med.) Voltage	3289
4	Industrial High Voltage	6621
5	Public Lighting	136
6	Traction Railway	420
7	Agriculture	11605
8	Public Water works	607
9	Supply in Bulk to licensees	3661
10	other (supply to interstate)	25
	Total	**31001**

NEED FOR REFORMATION IN GEB

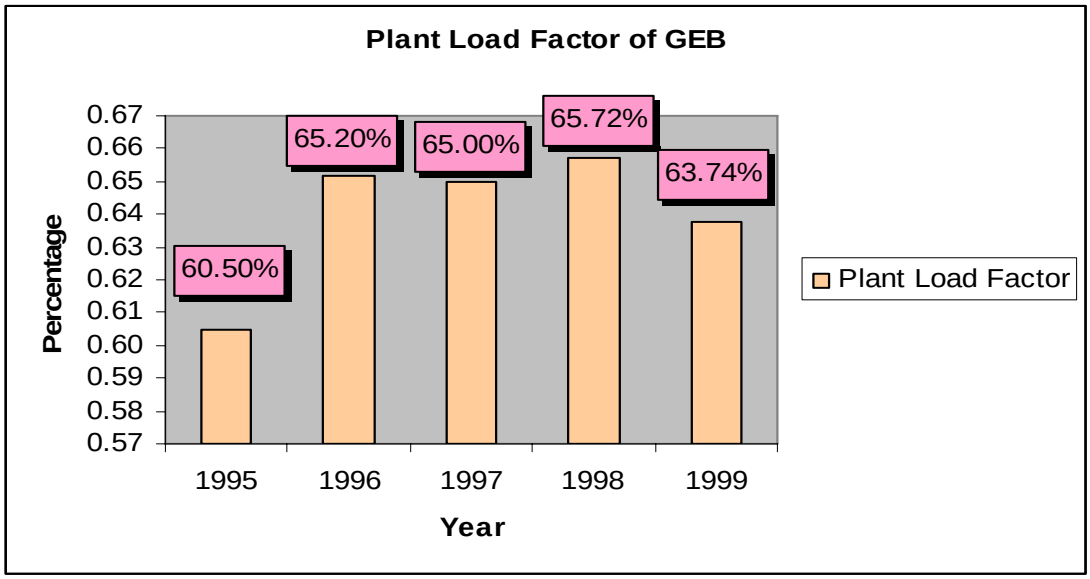
There are several reasons for urgent reforms mainly in the structure of organization, in overall working style and in the efficiency of the organization namely Gujarat Electricity Board. These reasons are

1. Lack of efficiency in generation of electricity
2. Higher transmission losses
3. Ineffective performance in distribution of energy
4. Political interference in internal functioning of the board
5. Power sector reforms drive in India

(1) Lack of efficiency in Generation activity of Gujarat Electricity Board

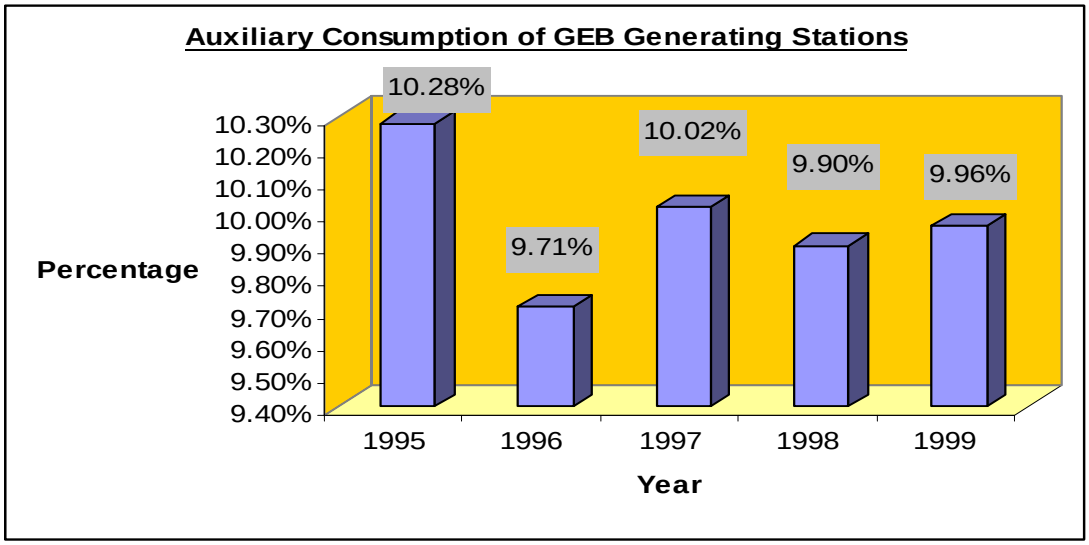
Generally, the generating capacity of any generation station of electricity is measured by its plant load factor and auxiliary consumption. From the financial year, 1994-95 to FY 1998-99 the plant load factor remained 60 % to 65 % on an average. (Figure - 2) It showed that the generating efficiency had a stagnant growth rate and required an improvement for better functioning.

Figure- 2 Plant Load Factor status of GEB before reformation



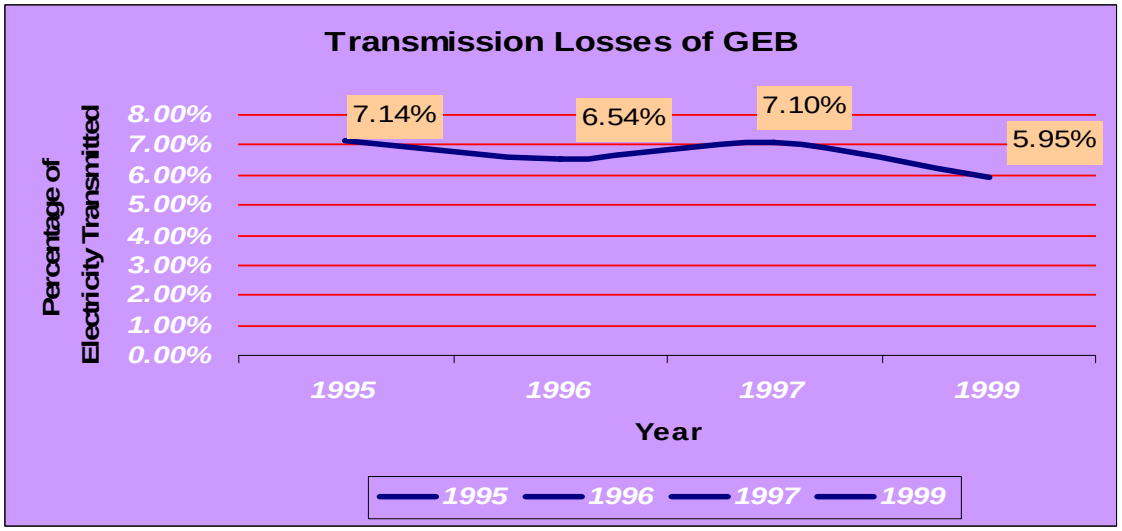
As far as auxiliary consumption is concerned, the performance of Gujarat Electricity Board has comparatively remained high. Basically, it was the power loss at the stage of generation. It almost remained at 9% to 10% over the period of five years since 1995. (Figure - 3) Such auxiliary consumption contributed to the heavy generation losses and low rate of return on investment as a natural corollary.

Figure – 3 Auxiliary Consumption of GEB generating Stations



(2) Higher Transmission Losses

Figure – 4 Transmission Losses of GEB

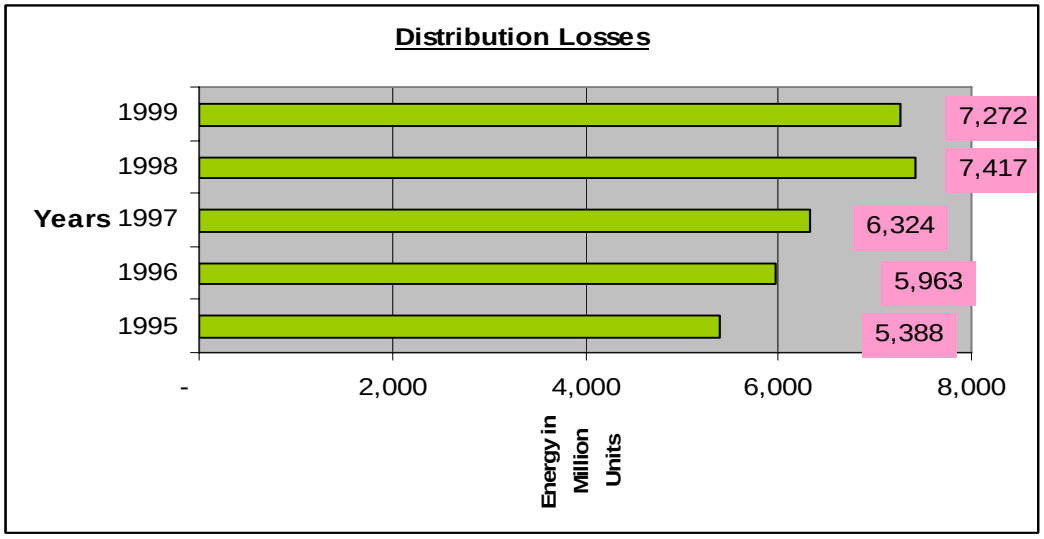


Higher transmission loss was the major motivational trigger for the reform in power sector in Gujarat in general and Gujarat Electricity Board in particular. As per Figure - 4, it is evident that from the FY 1995 onwards to 1999, the loss remained around 6% to 7% - of the total percentage of electricity transmitted. The main reasons for such losses were huge amount of power theft, obsolete equipments used for transmission of electricity and lack of effective supervision especially on High Tension (HT) consumers.

(3) Ineffective performance in distribution of energy

Performance in distribution of energy transmitted is being measured by distribution losses. The minimum loss reflects the better position of power in terms of distribution efficiency. Distribution losses are largely commercial losses arising from non-metering, theft and non-collection of tariffs. In case of GEB, since the FY 1995, distribution losses kept on mounting till FY 1999. (See Figure - 5)

Figure – 5 Distribution Losses of GEB before reformation



The matter was aggravated to such an extent that timely solution was urgently required.

(4) Political Interference in internal functioning of the Board

According to the 7th schedule of the constitution of India, which defines the share of responsibility between the Union and the State governments of the Indian federal system, the power sector lies in its concurrent list. This means that the Union sets the policies and each State is in charge of its implementation and of operationalizing the

system in its respective territory.[4] This sector used to fall under the rules framed by Electricity Act, 1948, and its successive amendments. (and since 2003, under the Electricity Act, 2003). The Electricity act, 1948 used to specify that at the state level, the Sate Electricity Bards are responsible for the development and operation of generation, transmission and distribution in the most economical way. The SEBs have got an autonomous status. Each SEB reports to the Power secretary of its respective state government, who is the highest civil servant under the State Minister of Power. State Electricity Boards are attached to Planning Commission since the latter determines the desirable investments and coordinate its functions with the other Ministry such as Ministry of Finance, Coal, Railway, Water resources and Agriculture. Secondly, Central Electricity Authority (CEA) has been providing technical advisory services to each SEBs.

Where organizational structure is found overlapping, it is quite obvious that vested interests will play a vital role when there is going to be a constant interaction among bureaucratics and political heads at different layers of Central Government, several State Governments, Technical bodies, and Advisory bodies. Here, this vested interest will endeavor to promote their interest by making connivance with the politicians and bureaucrats. For example, according to the report of the World Bank (1997), the root cause of the inefficiency of the power sector in India – now largely recognized by the policymakers – is the pervasive politicization of most decisions affecting Electricity Boards operations and expansion, and resulting the lack of commercial outlook in its functioning.[5] The state, generally, has regarded its Electricity Board as an extension of the government and has exerted the influence over its tariffs, operational, personnel, procurement and investment decisions to further political objectives. As a consequence, Electricity Board has been compelled to charge low tariffs to agricultural and residential consumers, and to undertake or continue unremunerative activities on behalf of the State Government without expecting the reward. Electricity Board has not been able to enforce survival remedies to collect bills, and to take bold measures in order to eliminate the large system non-technical losses.

Gujarat Electricity Board, like other SEBs obstructing for many years from behaving as a commercial entity, had thus been progressively transformed into an extension of the State Government and finally had been unable to meet the requirements of electricity of the State.

(5) Power sector reform drive in India

Power sector reformation in India became necessary because of the following factors:

[4] Privatizing Power Cuts? – Ownership and Reform of State Electricity Boards in India, page no. 77, Written by – Joel Ruet, published by Academic Foundation, New Delhi, 2005

[5] ibid. page no. 78

- ✓ Poor financial condition of State Electricity Boards.
- ✓ Lack of commercialization of power utilities.
- ✓ Increase in burden of subsidy for States.
- ✓ Deterioration in quality of service and growth in power shortage.

These motivational reforms have been identified by extensive opinions of experts as well as of key players in the industry. Reformation can be driven by the desire to improve the economic efficiency of the enterprise. This is the standard reason cited in most literature on the economics of electric power markets. Taking into account the hurdles to be cleared in restructuring the power system-- and interlocking the functions of state-owned enterprises- it is expected that efficiency alone is not the extreme factor, but sometimes, the high costs of electricity production and the political collusion are strong factors to push up restructuring activities. Many firms are largest users of electricity like steel plants, mining operations, and heavy manufacturing. For them, the solution for high prices is to negotiate with the state system to lower the prices of their inputs through central command rather than to break up the entire system. Lower electricity prices would make it hard for electric power utilities to stay afloat in terms of financial viability, which in turn would create a need for additional transfers of monetary resources and other state based financing.

The reform is driven by crisis in supply. In state centered systems, where prices are typically regulated, problems of poor supply are often reflected in blackouts and other quality failures rather than high prices. Where power supply quantities are inadequate, a useful barometer of political power is distinguished by considering as to who bears the brunt of blackouts and who achieves benefits. However a breakdown in the state financing system would trigger crises in supply and thus motivate reforms.

Restructuring can also be pursued as a part of a broad based streamlining the activities of Indian economy. Such efforts usually include attempts by the state to exit a wide array of industries such as ports, airlines, communications and natural resources. Thus it is always expected that electricity would be among the last industries to be restructured as part of a comprehensive reform strategy simply because of introduction market forces that lead electricity among the list of most complicated tasks. The physics of electricity make it difficult to proceed with reformation on a piecemeal basis, and often the sources of greatest dysfunction in the power system are parts like transmission and distribution that are truly natural monopolies. Rapid technological changes, especially in wireless communications and the ability to isolate highly competitive parts of the market from the elements that retain characteristics of monopoly tend to create a huge opening for competition.

Reforms can also be launched by political entrepreneurs in an attempt to re-allocate assets. In state owned system, talented and politically connected entrepreneurs will usually work within the state system to redirect rents. But for

political forces that are outside the system restructuring can be viewed as the strong strategy for shifting the ownership of firms to different states or private interest groups. This can be a key driver for reform only in cases where there is high degree of asymmetry between control over electric power assets and those who have the power to implement a full scale reforms.

Reformation efforts may be launched because it is considered a trend or a necessity. In fact, policy makers at the State Government (Government of Gujarat) level always face enormous pressures and challenges to transform GEB since the Electricity Act, 2003 has been formulated. Before the enactment of Electricity Act, 2003, Government of India had pursued power sector reforms in form of setting up regulatory commissions and designing distribution reform programmes under its flagship programme Accelerated Power Development & Reforms Programme (APRDP) which has been discussed in later part of the case.

THE ELECTRICITY ACT 2003[6]

THE recently enacted Electricity Act, 2003 heralds the third phase as the `trial-and-error' process of power reforms, which has been under way since the early 1990s. The first phase was dominated by the Independent Power Producer (IPP) paradigm, but was grounded to a halt within few years of its launch owing to many contradictions. The second phase was marked by the Orissa model of distribution reforms with its thrust on privatization. The degraded failure of the Orissa model ensured that this phase remained a non-starter in other States although Delhi managed to push through a slightly different model with liberal subsidy support from the government. The new Electricity Law consolidates all existing laws allowing trading in electricity and seeks to introduce markets for electric supply in the hope that at least this will revive the country's beleaguered electricity sector.

The new law provides `open access' to transmission and distribution networks so that consumers can source their supply from any supplier, be it the incumbent distribution licensee the State Electricity Board, IPP or a licensee of another area. While theoretically `open access' is available to any consumer, in practice, it will be limited to bulk consumers such as to industries and commercial establishments. It is infeasible to introduce competition in low-tension supply not only because there are millions of consumers to be serviced, but also because this segment is considered unremunerative. Tariffs charged on low-tension consumers both in rural and urban areas are currently cross-subsidized by the high-tension and commercial consumer segments. Once the latter decide to source their power directly from IPPs, thanks to `open access', the incumbent utility - the SEB or its successor entity - would be left with the marginal consumer segments whose present tariffs would be insufficient to cover the costs of supply.

[6] Content adapted from http://www.powermin.nic.in/acts_notification/electricity_act2003

The loss of the cream consumers would seriously jeopardize the ability of the SEB to go on servicing the unremunerative consumer segments.

To reconsider the fact, *Section 68* of the Electricity Act, 2003 provides: "If the State government requires the grant of any subsidy to any consumer or class of consumers in the tariff determined by the State Commissions, the State government shall... pay in advance... the amount to compensate the person affected by the grant of subsidy." While that might seem a reasonable proposition, in reality State governments have been unable to pay out the subsidies. The Andhra Pradesh government, which during the past three years had directed the regulator to peg the tariffs of rural and domestic consumers below the cost of supply, had agreed to pay out subsidies running into thousands of Crores. But owing to its straightened financial condition, it ended up issuing bonds to the distribution companies and making book adjustments in lieu of cash. The Andhra Pradesh Electricity Regulatory Commission has ordered that if the State government fails to pay up the subsidy, the distribution companies are free to charge tariffs that reflect the cost of supply.

In case of a situation where less than half of the electricity that is supplied is actually paid for, tackling commercial and technical losses would automatically raise the revenues of the utilities and without any increment in tariffs. However, Section 135 of the Act prescribes a penalty of three times the financial gains accruing from theft for the first conviction and only imprisonment for subsequent convictions, that too for theft of more than 10 kilowatt hours. The emphasis on cost-reflective tariffs and elimination of subsidies in the absence of stringent anti-theft laws is a sure recipe for pushing the marginal and poor consumer segments out of the grid, limiting electricity supply to those who can afford it. The significant achievement of the new law is that it treats electricity as a commodity and entrust its supply to the markets.

Under Section 7, all generations, including captive generation, has been de-licensed. In all probability, mini generation plants - perhaps diesel gensets - will proliferate in urban residential colonies, as Section 13 authorizes the SERCs to exempt users' associations, panchayat institutions, cooperative societies, non-governmental organizations and franchisees from procuring license for power supply. Industries too would opt for captive generating plants.

One important provision that did not figure in the original Bill but found its way into the Act is a proviso in Section 14, which stipulates that "the Appropriate Commission may grant a license to two or more persons for distribution of electricity through their own distribution system within the same area", if such licensee complies with the requirements like capital adequacy, creditworthiness etc.. This is nothing but an allowance for duplication of networks, a waste of national resources that even the most prosperous economies refrain from advocating.

Documentation of Electricity Bill, 2001 and the subsequent enactment of Electricity Act, 2003 reflect a measure of motivation on the part of the government to explore the horizons and to continue the reform agenda in power sector of Indian economy.

CERC

It is pertinent to discuss here, the regulatory set up governing electricity scenario in India. Central Electricity Regulatory Commission is the regulatory authority of electricity generation, transmission and distribution activities all over India. It has its state wise offices such as Gujarat Electricity Regulatory Commission (GERC). The Commission intends to promote competition, efficiency and economy in bulk power markets to improve the quality of supply to promote investments and to advise government on the removal of institutional barriers to bridge the demand supply gap and thus foster the interests of consumers. In pursuit of these objectives the Commission aims to –

- ✓ Improve the operations and management of the regional transmission systems through Indian Electricity Grid Code (IEGC), Availability Based Tariff (ABT), etc.
- ✓ Formulate an efficient tariff setting mechanism ensuring speedy and time bound disposal of tariff petitions, promoting competition, economy and efficiency in the pricing of bulk power and transmission services with least cost investments.
- ✓ Facilitate open access in inter-state transmission
- ✓ Facilitate inter-state trading
- ✓ Promote development of power market
- ✓ Improve access to information for all stakeholders.
- ✓ Facilitate technological and institutional changes required for the development of competitive markets in bulk power and transmission services.
- ✓ Advise on the removal of barriers for entry and exit of capital and management, within the limits of environmental, safety and security concerns and the existing legislative requirements, as the first step to the creation of competitive markets.[7]

APDRP

[7] Content adapted from http://www.cercind.gov.in/about.htm

Power is a critical infrastructure for economic growth. The economic acceleration would greatly depend upon a commercially viable power sector that is able to attract fresh investments. 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.26,000 Crores during 2000-01 which was equivalent to about 1.5% of India's GDP. Accelerated Power Development Programme (APDP) had been undertaken from the year 2001-02 as a last means of restoring the commercial viability of the Distribution Sector.

As incentive financing is proposed to be integrated with the existing investment programme to achieve commercial viability of SEBs / Utilities and link it to the reform process, the original APDP was rechristened to Accelerated Power Development & Reforms Programme (APDRP) during 2002-03.

The objectives of APDRP are:

- Improving financial viability of State Power Utilities
- Reducing AT & C losses to around 10%
- Improving customer satisfaction
- Increasing reliability &quality of power supply

In APDRP, initiatives have been undertaken for bringing about commercial viability of SEB/Utility by various levels of interventions such as commercial intervention, technical intervention and administrative intervention.[8]

DISTRIBUTION REFORMS BY APDRP

The Distribution Reform[9] was identified as the key area to bring about efficiency and improvement in financial health of the power sector. Ministry of Power took various initiatives in the recent past for bringing improvement in the distribution sector. All states have signed the Memorandum of Understandings (MoU) with the Ministry to take various steps to undertake distribution reforms in a time bound manner. Subsequently, 24 states have constituted SERCs and 20 have issued tariff orders in the direction of rationalizing the tariffs. States are now better committed towards subsidy payment to the utilities.

All states have securitized their outstanding dues towards CPSUs. 13 states have unbundled their SEBs. 9 States are expected to un-bundle their SEBs by June '06. Electricity Distribution has been privatized in Orissa and Delhi.

Capacity Building within SEBs/Utilities was an essential need.

[8] http://www.apdrp.com/apdrp/projects/about_apdrp.htm

[9] http://www.apdrp.com/apdrp/projects/distribution_reforms.htm

Even though SEBs have expertise in different fields, the strengthening of the sub-transmission & distribution network on a scientific basis using computer aided tools requires an integrated knowledge. Most SEBs, during the regional meetings held in April and then later in June, 2001 expressed their inability to take up such work with their own manpower. It was considered necessary to promote capacity building exercises in SEBs/State Power Utilities to enable SEB personnel to prepare detailed project reports for each district and implement the project using APDRP funds at a later stage.[10]

Capacity building exercise is mainly to cover training the manpower, energy audit & accounting studies, making the SEB officials collect relevant data from each 11 KV feeder in the identified circle, analysis of the data using computer tools to prepare feeder wise computer aided least cost project report, supervision of implementation.

Several training programmes were organized by the training institutions such as Power Management Institute (NTPC), National Power Training Institute, PGCIL etc., and several working level officers from various SEBs benefited from these programmes. It is further planned to bond their efforts by imparting quality training to bring about changes in business perspectives which is crucial in the success of our power reform programme.

However, all such measures are cosmetic in nature. Distribution reforms require a structural change in the existing set up of the SEBs. Government of Gujarat took the call and initiate power reforms with great vigor. Today, it is the 2nd no. state in power reforms next to Andhra Pradesh

GUJARAT ELECTRICITY BOARD TRANSFORMATION

A transformation story of GEB prominently appeared in newspaper on 13th June, 2006 seems to have gone unnoticed. The news headlined that Gujarat Government has successfully turned around the Gujarat Electricity Board (GEB) which was about to go sick five years ago, enabling the latter to earn a net profit of nearly Rs 200 crore and that too, without raising power tariffs. Specifically speaking, the Board has come across one of the most significant transformation in recent times with the profit of Rs 200 crore in fiscal year 2005-06 replacing the whopping cumulative loss of Rs 2,542 crore in fiscal 2000-01.[11]

Although the power sector reforms were directed centrally i.e. the guidelines and incentives of power sector reforms were issued by Central Government of India, Government of Gujarat (GoG) was able to increase the revenue and reduce the expenditure with its execution skills, financial prudence and economical measures, and most importantly

[10] Content adapted from - Privatizing Power Cuts? – Ownership and Reform of State Electricity Boards in India, page no. 63-66, Written by – Joel Ruet, published by Academic Foundation, New Delhi, 2005.

[11] http://www.thehindubusinessline.com/2006/06/13/stories/2006061303680300.htm

was able to take some really tough and politically-sensitive steps, such as completely ignoring the pleas of politicians etc.

Hon. Minister of State, Mr. Saurabh Patel wisely credited this transformation as the "political will" of the Gujarat administration. The Board officials were directed to deal sternly with cases of power theft and non-payment of bills either by individuals or by companies. He accorded the major credit to the execution skills of administrators especially in areas of action against violators of GEB norms. For example, State Government set up five regional special police stations to deal with such cases and punish the violators.[12]

Interestingly, they appointed 500 retired army personnels to keep the power offenders in check. Thousands of theft cases were detected and then disconnected; they were reconnected only after the violators, including companies, paid their arrears though certain numbers of violators were convicted by the courts. GEB, thereby, appointed managers who were accountable to settle the case. As a result, nearly 20 lakh connections were verified and rechecked annually.

The contributions of GEB officials were truly noteworthy in this transformation. To highlight, GEB officials, accompanied by police, wandered from villages to towns during night hours to check power theft. While implementing the same, they also braved the irate people who attacked them at several places and protested in all possible manners. For instance, once, an official was kidnapped and kept in bondage until rescued by the police after several hours. Despite these, the Board went ahead with strict measures, in accordance with the provisions of the New Electricity Act that empowered the authorities to lodge criminal cases against power thieves.

[12] Ibid.

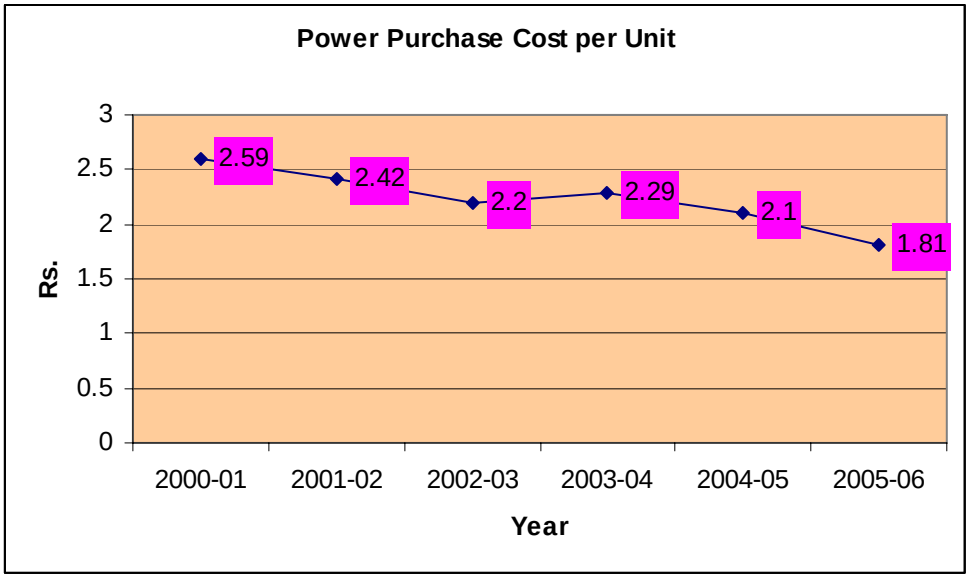
STRATEGIES FOR REFORMATIONS

The key strategies undertaken for improving the performance of erstwhile GEB are:

1. Optimization of power purchase cost
2. Overall improvement in operational efficiency
    a. Structural reforms
        - Unbundling of GEB
        - Corporatisation of GEB
    b. Reforms to reduce AT & C Losses
        - Curbing transmission and distribution losses
            I. Bifurcation of feeders
            II. Distribution transformer's review
            III. Increase in number of substations
            IV. Curbing Power theft
            V. Sealing of connections
            VI. Provision of Metal Meter Boxes
            VII. Grievance redressal through effective appellate procedure
            VIII. Optimum use of Information Technology
                i. Installation of Geographical Information System
                ii. Introduction of Enterprise Resource Planning
3. Significant improvement in Cash collections.
4. Human Resource Management
    a. Augmentation in Manpower Efficiency
    b. Enhancement and Human assets development
5. Focus on rural electrification by unique scheme "Jyoti Gram"
6. Savings in interest cost by debt restructuring – Financial Restructuring

1. Optimization of Power Purchase Cost

Figure – 6 Power Purchase Cost per Unit



The power purchase cost has been reduced by renegotiating Power Purchase Agreements with Independent Power Producers (IPP).

The most remarkable fact is that this transformation marked its pave without raising power tariffs despite of a significant increase in the cost of railway freight, coal and gas prices. GEB followed a simple principle: Increase revenues and reduce expenditure. Firstly, GEB decided to renegotiate the power purchase agreements (PPAs) with independent power producers (IPPs). In 2003-04 , it began renegotiating with the four IPPs - Essar Power, Gujarat Paguthane, GIPCL and GSEG, the latter two being state-owned companies. The direct result to this was a Rs 4.95 crore saving in payments to IPPs in 2004-05. Continuing the negotiations, it managed to get a further reduction of Rs 64 crore in the first half of 2005-06, leading to a total annual saving of Rs 559. As GEB's dues to the IPPs had piled up to a staggering Rs 1,200-1 ,300 crore in 2003-04 , it asked these companies to work out a compromising solution failing to which they would have to end the operations as GEB would become sick. Today, after the renegotiating of PPAs, all dues of GEB have been paid-up with no outstandings.

Secondly, GEB created a reduction in general purchase cost through creation of a Centralized Purchase Cell, helping them to initialize timely and cost-effective procurements of materials and proper inventory planning.

Thirdly, GEB strived hard to save its fuel costs. It commenced to use washed coal having ash content below 34 %. Use of washed coal was necessary to fulfill the Ministry of Environment and Forest (MOEF) Notification relating to air pollution, increased plant performance of thermal power stations as well as overcoming the problems of water scarcity and ash disposal. As per **Table – 2 ,** GEB began using washed coal on an increasing scale at their thermal power stations, especially at Ukai Power station and Wanakbori Power Station since April 2001 and November 2003 respectively. At Gandhinagar Power station, use of washed coal started from April 2004. This step led to huge savings of Rs. 137.93 Crore over the period of four years.

At present, continuous efforts are being made by GEB to get higher percentage of better quality of coal. In fact, it has devised the coal matrix to comply with the MOFE notification. In addition, it had made it mandatory to use mixed coal collected from various sources having ash content of less than 34 %.

Table – 2 Used of washed coal and savings generated.

No.	Used of Washed Coal	Qty. in Mt. Lacs	Savings (Rs. in Crores)
1	2005-06	31.43	56.00
2	2004-05	27.13	51.00
3	2003-04	14.00	24.05
4	2002-03	11.03	6.88
5	**Total Savings in 4 years**		**137.93**

In addition, use of better quality coal led to net saving of Rs 22.58 Crores. Government of Gujarat has utilized such savings to reduce the power purchase cost. As per the latest annual report, it has imported coal from Indonesia in the year 2003-04 which helped the entity to save Rs. 20 crore.

2. Increase in operational efficiency

In order to enhance operational efficiency of GEB, the government of Gujarat has used several tactics such as structural reforms, organizational restructuring, steps to curb power theft, reduce technical losses as well as better customer service by using Information Technology (IT) tools.

(A) STRUCTURAL REFORMS

Need for Organizational Restructuring

Reformation in State Electricity Board (SEB) has been a debatable issue in India since the overall economic reform process acquired momentum. It is noticed that a consistent reform scheme has been promoted by Government of India, with the support of development agencies, like World Bank standing as a pillar. This scheme is called structural reform since it out bounds the earlier cosmetics and limited attempts.

To start with, SEBs especially Gujarat Electricity Board strongly necessitates the want for speedy reforms in organizational structure as well as procedural aspects of the organization due to higher technical and commercial losses, rising power theft, growing burden of subsidies, massive political interference, lack of competitiveness, and absence of operational efficiency. In fact, these reforms have crystallized in Electricity Act, 2003 which extends the logic of structural reforms and puts them in the 'competitive oriented framework'. Interestingly, for the outside funding agencies, structural reforms are transition phases to usher in privatization.

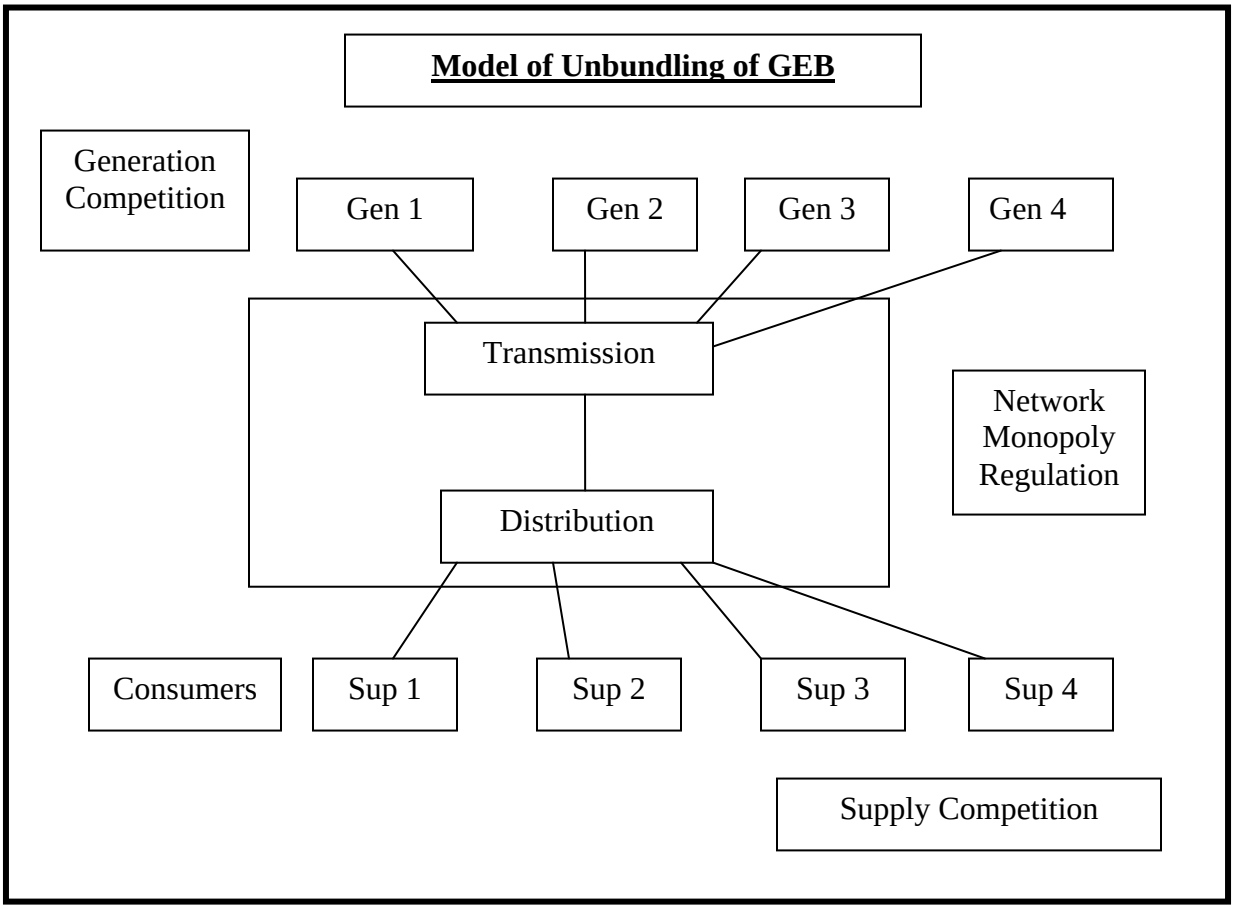
Secondly, these structural reforms support de-integration in the overall organizational makeup. As informed in the case, there are primarily three activities in power sector – generation, transmission and distribution of electricity. It is agreed that transmission is just a natural monopoly. However, generation is competitive and distribution is only a local natural monopoly. Thus both generation and distribution need not remain as horizontally integrated. They have to be separated from transmission to avoid distortion in competition. And ultimately electricity board's functions must be vertically de-integrated. In addition, such de-integration of functions can provide transparency in the organization.

Finally, such structural reforms are aiming at making transparent procedures, availing more internal discretion and avoid direct executive instructions as well as political interference so that losses can be minimized, expenditure could be curbed and efficiency can be augmented.

The Gujarat Electricity Board (GEB) is one of the most advanced, progressive and technically equipped electricity boards in India. GEB's principal objective is to provide better services to the people of Gujarat with an aim to supply un-interrupted power to the large number of consumers.

In order to become a profit making, efficient and effective organization with the best customer services, GEB, first of all, carried out organizational restructuring process.

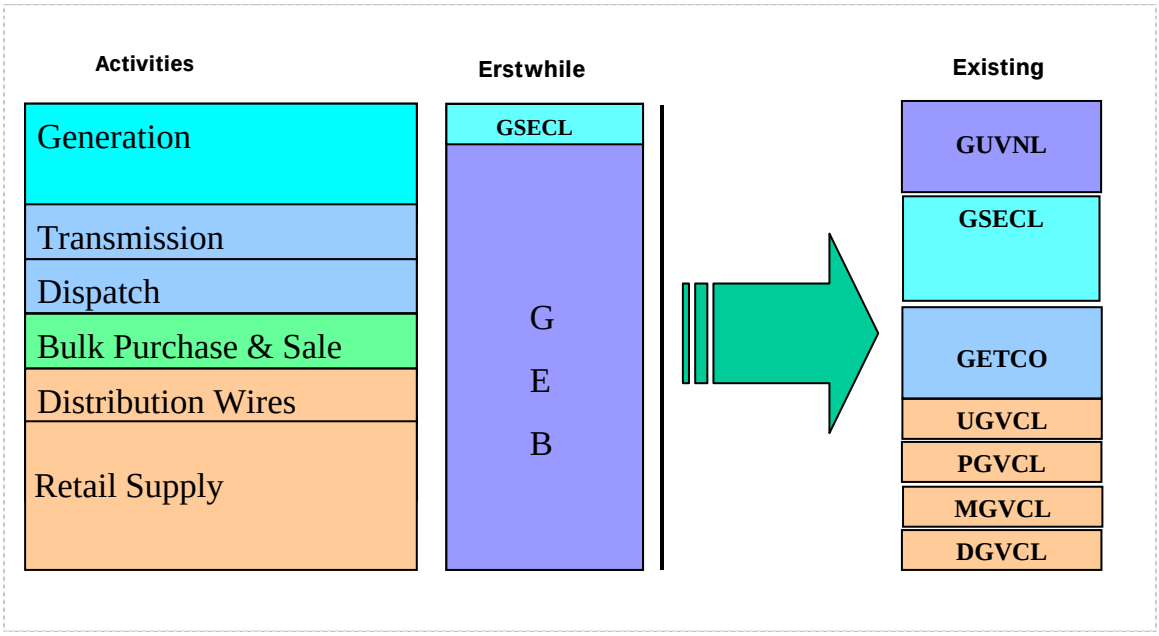
Figure – 7 Model of Unbundling[13]



Basically, unbundling means restructuring or reorganization of various utilities into different autonomous component operations. It is in fact, a practice of creating several departments into independent strategic business units (SBUs). For example, earlier a state electricity board (SEB) in India was performing activities relating to power supply except generation. Now, with the introduction of Electricity Act, 2003, the competition is encouraged by private players in form of Independent Power Producers (IPP) for generation and distribution of electricity. However, the monopoly in network of transmission has remained intact with State. (SEE MODEL of Unbundling) In order to deal with the competition propounded by Electricity Act, 2003 to achieve efficiency in operations, state government of Gujarat has restructured its organization set up by dismantling of the SEBs and creation of `independent organizations' with `unbundled functions. (See figure -8) These organizations are to be turned into `privately owned body corporate' which would help in the growth of the power sector since "the quest for higher profit will motivate their activities, and they will have a greater commercial orientation than most Government-owned organizations".

[13] Economic and Political Weekly. Internet Edition.

Figure – 8 Structural and Functional Comparison of Erstwhile and Changed GEB [14]



The transformational structure

Earlier, all the activities namely transmission of power, dispatch of electricity, bulk purchase, distribution of electricity to the end users in rural and urban areas of Gujarat were being handled by the Gujarat Electricity Board. Now, Central Government has paved the way for comprehensive restructuring and reorganizing of the electricity boards as per Electricity Act, 2003. Besides, Government of Gujarat has formulated the Gujarat Electricity Industry (Reorganization & Regulation) Act, 2003 which results into split of Gujarat Electricity Board into four regional power generation companies, four regional distribution companies, one transmission company and one parent company. (**See Figure -8)**

As a result, GEB has acquired corporate status and renamed as Gujarat Urja Vikas Nigam Ltd.(GUVNL). It continues to focus on its key objectives of generation, transmission and equitable distribution of power to achieve an all-round economic growth of the State.

For few more details, Gujarat State Electricity Corporation Limited (GSECL) was incorporated under the Companies Act 1956 in 1993 with the motto to initiate a process of restructuring of Power Sector and to mobilize resources from the market for adding to the generating capacity of State and improving the quality and cost of existing generation. GSECL envisages a wide spectrum of activities to improve the electrical infrastructure of

[14] Adapted from a presentation of Mrs. Joshi, Managing Director, GUVNL, 2006 on GEB reformation process.

Gujarat. GSECL has initiated its activities in the field of generation of power. Government of Gujarat has also given to the GSECL the status of Independent Power Producer (IPP) with approval to undertake new power projects. The Equity Share Capital to the tune of Rs. 4440 Million is entirely held by GUVNL. It is a unique and innovative concept visualized by Gujarat Electricity Board with a view to corporatise the power sector and to enhance the generating capacity with funds from financial Institutions, Banks etc. The Company made Profit of Rs. 1080 Million for the year ended in March, 2001

Also, with the initiation of power sector reforms in the State of Gujarat, The Gujarat Energy Transmission Corporation Ltd (GETCO), has been created to look after the transmissive functions such as construction, operations and maintenances of transmission lines and substations. In its endeavor to improve the efficiency in its operations, Government of Gujarat has decided to bring in expertise through public participation in its transmission business, in keeping with the trend of outsourcing the operation & maintenance of sub-stations. Currently, the network of 10 transmission circle offices and 59 division offices is being managed by GETCO.

Finally, Government of Gujarat has incorporated four distribution companies for four different geographical regions of the State. For regions of north Gujarat, it has formed Uttar Gujarat Vij Nigam Ltd (UGVNL). Likewise, it has formed Madhya Gujarat Vij Nigam Ltd.(MGVNL), Dakshin Gujarat Vij Nigam Ltd(DGVNL) and Paschim Gujarat Vij Nigam Ltd. (PGVNL) for conducting the functional distribution of electricity in Central Gujarat, South Gujarat, and West Gujarat respectively.

Their objective is to undertake the electricity sub-transmission, distribution and retail supply in the respective regions of Gujarat or outside the State. For this purpose, they are authorized to plan, acquire, establish, run, manage, maintain, and modernize a power system network in all its aspects. They are also empowered to carry on the business of purchasing, selling, importing, exporting, and trading of electrical energy. It includes formulation of tariff, billing and collection thereof. In addition, they can investigate, collect information, review operations, plan, research, design and prepare project reports, diagnose operational difficulties and weaknesses and advise on the remedial measures to improve and modernize existing sub-transmission and supply lines and sub-stations.

Moreover, a state (regional) load dispatch center has been created at Jambuva (Vadodara) as per the requirement of Electricity Act, 2003. The role of state load dispatch centre is largely to ensure quality power supply at rated voltage and frequency. It has to deal with economical scheduling and dispatching of power produced by - Gujarat Electricity Board, Central Sector Power Stations and independent power projects.

Apart from these, a state load dispatch center has to consider the following functions:

a. Ensuring system security and stability.
b. Monitoring and controlling exchange of inter-state and central sector energy.
c. Monitoring of loading values of lines / transformers etc.
d. Immediate restoration of power system after disturbance.
e. Forecast of generation availability and demand from various category of consumers for different seasons.
f. Planning and scheduling of generating unit outages.
g. Periodical review of load control measures

In nutshell, as a part of reform process, it has been envisaged to disaggregate GEB, the Promoting Body into separate entities with functional responsibilities for generation, transmission and distribution respectively with complete autonomous for operations.

Process of Corporatisation of GEB

Corporatisation is the part of the structural reform programme of GEB. In actual terms, corporatisation refers to the change of status, from Board to entity under Companies Act, 1956, that is, judicially speaking, to a status of company form of organization. Once an entity becomes a company from the Board, the changed status will become the basis of each and every reform stride.

As part of the corporatisation process, the following steps have been taken;[15]

- Professionals on the Boards of the Companies i.e. at generation level as well as t distribution level are hired for better management of such companies. There was a headhunt for the post of Managing Director in all companies. They have been recruited purely on their merits.
- Key Performance Indicators (KPIs)[16] have been introduced. These indicators are charged as the benchmarks of performance. Actual performance is being measured against the standards set by KPI. Corrective actions are mandatory for the deviations found between actual and standard KPIs.
- Mission and Vision statement of each Company have been formulated and subsequently communicated to the employees of all companies through introducing wider visibility in form of banners and posters on the office walls of the companies and their working stations.

[15] Adapted from a presentation of Mrs. Joshi, Managing Director, GUVNL, 2006 on GEB reformation process.
[16] See Annexure - 2

- Financial autonomy has been awarded to each Company.

As discussed earlier, a regulatory authority named Gujarat Electricity Regulatory Commission has been set up in 1998 under Regulatory Commission Act, 1998. The process of corporatisation has been cemented with the help of such an appropriate regulatory set up.

The main functions of regulatory commission of the state are the tariff settings, determining profitable operating conditions for the operators and protecting the larger consumer interests in electricity market. It issues tariffs that ensure financial viability for power companies, provided that they achieve minimal progress requirements on their efficiency. In reality, GERC has been assigned the task of balancing social subsidies, profitable tariffs and quality improvements.

Independent functioning of GERC over the span of 8 years of its operations has helped Gujarat Electricity Board to improve its operations, reduce its subsidies and serve their customers in a better way. It has issued two tariff orders, GRID Code, Supply Code, Distribution Code, and Standard of performance of distribution licensees. It has also set up one office of an Ombudsman in order to immediately dispose off consumer's grievances. It regularly conducts public hearing through participatory process. The last and the most important, all costs are scrutinized by GERC before approval. This results into cost savings to the larger extent.

(B) REFORMS TO REDUCE AT & C LOSSES (AGGREGATE TECHNICAL AND COMMERCIAL LOSSES)

Reasons for Energy losses

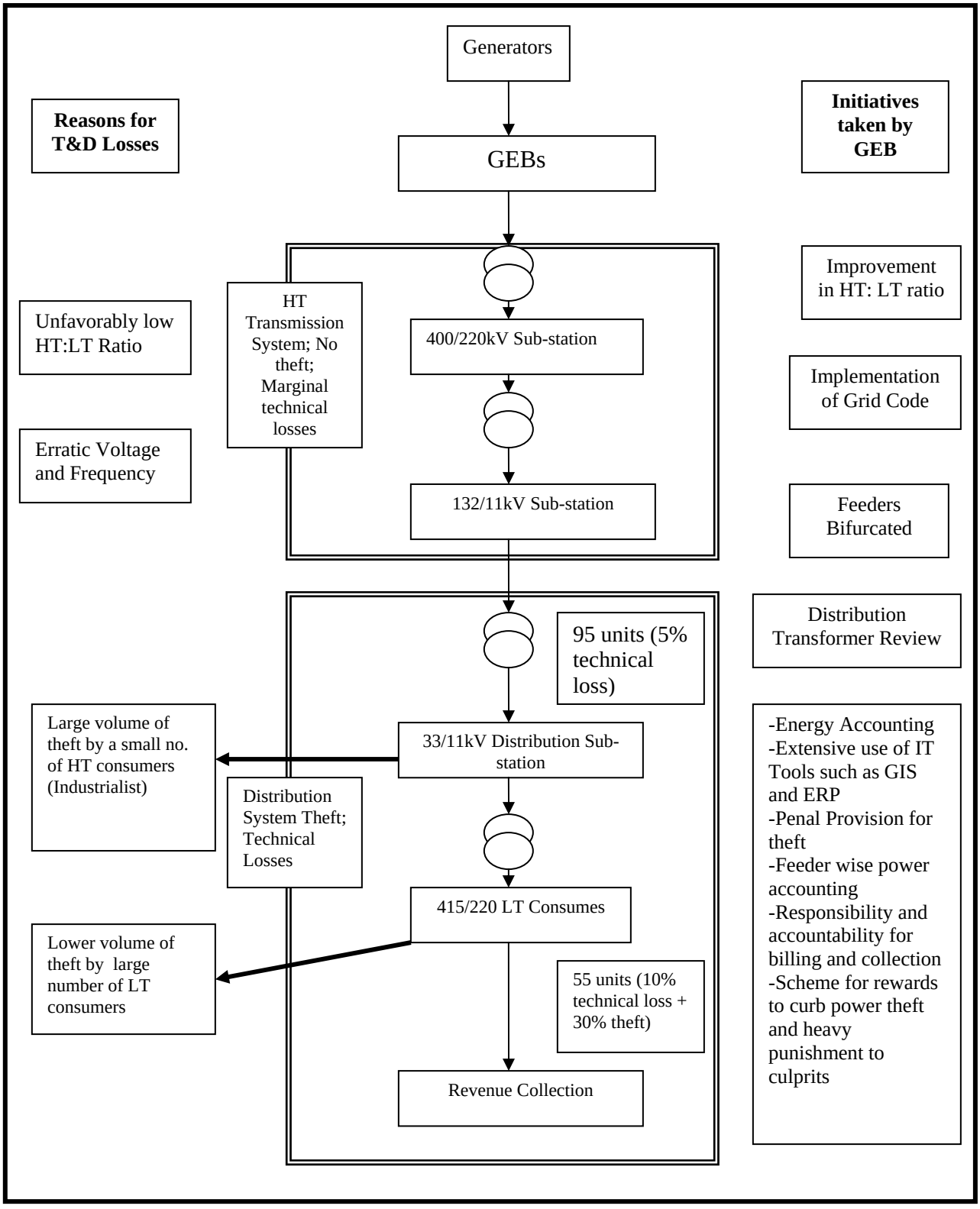
Initially, energy losses occurred in the process of supplying electricity to consumers due to technical and commercial losses. The Technical losses refer to the loss arised due to waste of energy produced. These losses have been cropped up in GEB mainly due to energy dissipated in the conductors and the equipments used for transmission, transformation, sub- transmission and distribution of power. Other reasons for greater technical losses are overloading of existing lines and substation equipments which in turn increases the distribution burn out rate and subsequent loss of energy. Secondly, absence of upgradation of old lines and equipments caused heavy damage in terms of loss in energy and obsolete equipments rarely helped to obtain better energy transmission and distribution. Poor repair and maintenance of equipments and old lines, overloading of existing lines, low number of substations, non-installation of sufficient capacitors and finally, low HT:LT ratio are the major reasons sited for the heavy technical losses. Low HT: LT ratio signifies that as compared to high tension lines, the low tension lines are quite few. The HT: LT ratio, ideally should be 1:1. However, due to the extensive electrification of the domestic sector in State and the consequent expansion of LT lines, the ratio has now become around 1:6.25.[17] This ratio can be improved only by drawing HT lines on a massive scale, which would entail big capital investments, besides a strong political will to deal with public resistance against taking the overhead lines over private lands.

As far as the commercial losses are concerned, they are caused by power theft, defective meters, errors in meter reading, estimating unmetered supply of energy**,** low accountability of employees, less efficiency of cash collection and lack of accounting and auditing of energy. The major possibilities of increase in power theft are considered to be unauthorized energy consumption by agricultural, industrial and retail consumers.

In the following graph, one can easily notify the reasons for the occurrence of technical and commercial losses as well as initiatives taken by the Gujarat Electricity Board to lessen such losses.

[17] Gujarat Electricity Board Annual Report, 2003-04, page no. 41 published by GEB

Figure – 9 Reasons for GEB Losses and Broad Initiatives taken by GEB to lessen them



(Adapted from Annual Report, 2003-04 Ministry of Power, Government of India)

Measures taken by GEB to prevent technical losses

Reduction in technical losses has now become the need of an hour for GEB to control its overall losses and modify the whole entity in its totality. Better technical innovations are imperatively required to increase overall efficiency of GEB operations, apart from merely structural reforms that would help in giving only hassle-free environment and autonomy with accountability to people at the helm of affairs for better management. Such technical inventions highlighted are conversion of the existing distribution network into a high voltage distribution system (HVDS) covering reduction of LT lines; taking high voltage line up to the load centre, supplying power through smaller capacity and energy efficient distribution transformers, reconducting over loaded lines, correcting power factor, mapping by way of Geographic Information System (GIS), obtaining pole wise consumer information etc.

Bifurcation of feeders

Feeder is a core component in the transmission line for supply of electricity. Essentially, it transmits power from generating station to a substation or a network. Then, such power is distributed to consumers from transformers. Most of the times, such feeders cause overloading which in turn lead to higher distribution transformer burnout rate. Besides, undersize conductors installed in each feeder simply add to the miseries. All these factors result into heavy transmission losses to GUVNL. Thus, a concerted effort is required to bifurcate the feeders leading to installation of more transformers and replacement or rectification of conductors in order to reduce overloading as well as lower distribution burnout rate.

Table – 3 Feeders Bifurcated from FY 2001-2005[18]

Feeders Bifurcated			2001-02	2002-03	2003-04	2004-05
A	Nos of Feeders	No	151	98	236	360
B	KM line erected	Km	759.17	473.21	1305	2046.34
C	Amount	Rs in Lacs	1296.68	839.99	2478	3879.28

[18] Adapted from Presentation on GEB reform by Mrs. V.L.Joshi, M.D., GUVNL, Vadodara, 2005

GEB has initiated rigorous efforts of bifurcating feeders to reduce this overloading. It started with bifurcating 151 feeders in FY 2001-02 where it reached to 236 in FY 2003-04 and 360 in FY 2004-05. GEB had to spent almost nearly Rs. 8 to 10 Lacs and erect at least 4 kms to 5 kms new lines (LT) in bifurcating one feeder. In addition, it required a great amount of labors from the lower strata of the organization.

Table – 4 Distribution Transformer review i.e. Transformers centers brought at load centers[19]

Distribution Transformer Review			2001-02	2002-03	2003-04	2004-05
A	Nos	Nos	580	648	650	1377
B	KVA capacity increased	KVA	31119	34247	34885	79880
C	Amount	Rs in Lacs	565.49	607.46	617.92	1649.21

Generally, a distribution transformer is used to supply relatively small amounts of power to residences. It is used at the end of the electrical utility's delivery system, which is often mounted on a pole. Distribution transformers (DTs) review, here, refers to the efforts of GEB to bring them at the load centers where better monitoring was took place to augment transformation capacity which benefited in (a) immediate financial gain (b) reduction in technical losses and (c) reduction of system break downs.

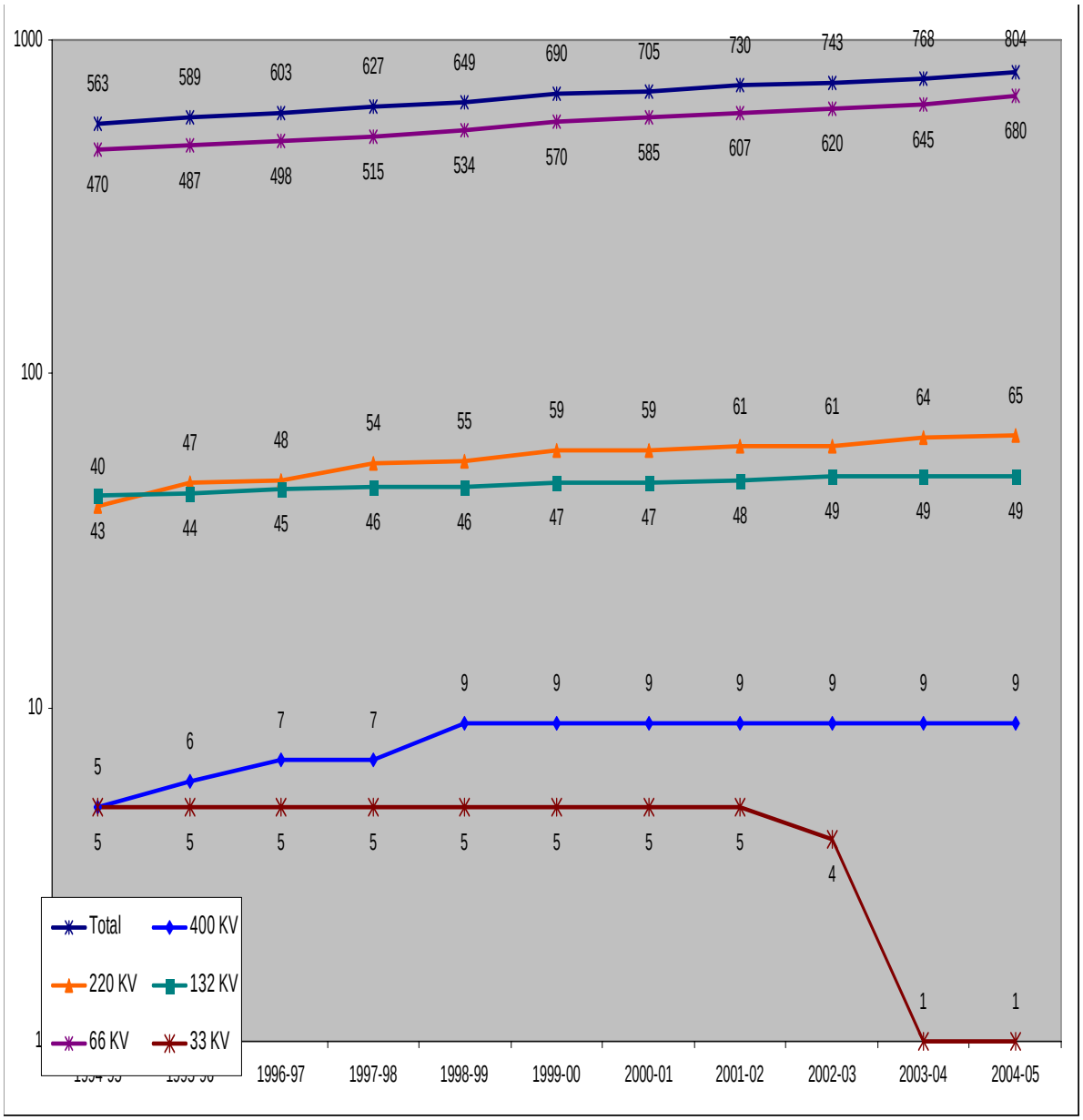
Increase in No. of Substations

Substation is a place that comprises of transformers distributing electricity with low voltage that can be easily accessed by retail consumers. In a substation, one can find a collection of equipments for the purpose of raising, lowering and regulating the voltage of electricity. In order to have transmission efficiency, Electricity Regulating Authority needs to increase in number of substations so that proper regulations can be executed. GEB has established, over a period of last 10 years, and increase in total number of substations from 563 in 1995-96 to 804 in 2004-05 where in 400 Kv substations are increased from 5 to 9 in 2004-05. Besides, the number of substations consisting of 220 Kv, 132 Kv, and 66 Kv are raised from 40 to 65, 43 to 49 and 470 to 680 respectively from 1994-95 to 2004-05. **(See Figure -)** Currently, **ABB** is undertaking the system studies for suitable location of substation, efficiency in the network and equipments to be used in the network. [20]

[19] Ibid.

[20] www.abb.co.in/.../$file/Customer+Newsletter+-+Contact+-2.pdf

Figure - 10 No. of Substation increased from 1994-95 to 2004-05[21]



[21] Adapted from Presentation on GEB reform by Mrs. V.L.Joshi, M.D., GUVNL, Vadodara, 2005

Replacement of Old Equipments

Last but not the least important measure is to replace old equipments with fresh ones and to undertake certain noteworthy system improvement measures. In fact, GEB has installed ring main units and Arial bunch conductors across several places to ensure continuous power supply and to curb power theft in a more stringent way.

To supply continuous power has been a major problem in Gujarat especially in rural areas. To bring a sensible solution, GEB has motivated its innovative technical executives to come up with appropriate suggestions to tide over the menace. For this, they have recommended to introduce the state-of-the-art Ring Main Units to ensure continuous supply of power. In depth, Ring Main Unit (RMU) is switchgear used solely to open and close electric circuits, specifically the one utilized to control a high-current application e.g. a power and transforming station or an electric motor. In addition, RMU provides greater flexibility in distribution thorough which supply can be restored from any adjacent section and faulty section can be easily isolated, leaving the healthy sections continue to operate. This would allow maintenance to be carried out in faulty section without disturbing other healthy sections. Therefore, considering the fact, GEB has initiated the process of ring main units in its several installations.

Arial bunch conductors are a collection of XLP insulated form of bear conductors made up of aluminum as a basic conduction element. Earlier, uninsulated form of bear conductors were used, which were in reality, easily prone to tampering. Later on, once it got converted into XLP insulated form of bear conductor and laid on air through poles in bunch in form of Arial Bunch Conductors, it, then, became highly impossible for the offenders to pilferage electricity by fixing direct connection.

Prevention of Power Theft

Initially, Gujarat was facing severe problem of enormous power theft from rural as well as urban areas. Power theft was, then, incurred either by illegally connecting private lines to the power supply wires, or by using electrical devices (commonly referred as 'hook' or *ankdi* in Gujarati) to divert the electrical current. This, usually, resulted in lower meter reading, allowed unauthorized consumption, objected interruption of the meter functioning or lines that were put up in upstream of unsealed meters. Such methods did not require an involvement of any GEB official, but of course, the availability of such help could worsen the situation. In certain cases, such power theft, both by high tension (HT) consumers as well as low tension (LT) consumers led to bribing the responsible authority as the amount of power billed was lowered by them (GEB agents) from the energy actually metered.

In its drive to reforms, GEB has set up one vigilance department headed by IPS (Indian Police Service) officer in the rank of Addl. Director General of Police on deputation by the Government of Gujarat. He is designated as "Director of Security & Chief Vigilance Officer"(DSCVO)

To keep constant vigil and to detect pilferage of power, GEB has formulated 74IC Squads working under Addl. Chief Engineer Vigilance under the control of DSCVO. In vigilance department, they have formed two types of squads' i.e.

(1) HT Squad – to check the HT installation

(2) LT Squad – to check the LT industrial, Commercial, Residential installations.

Interestingly, in order to supervise LT industrial connections, there are 63 LT squads, out of which 19 Squads are headed by Dy. Engineer and 44 Squads are headed by Jr. Engineer, stationed at different circles. Over and above these, the rest 11 HT squads, headed by Dy. Engineer, are stationed at Surat, Bharuch, Baroda, Bhavanagar, Mehsana, Sabarmati, Rajkot and at Baroda Head Office. [22]

Glimpse of Power Theft in Gujarat [23]

"The Gujarat Electricity Board has detected power theft of over Rs 3 crore during raids led by GEB director (vigilance) Gurdayal Singh in the towns such as Varachha, Puna-Khumbaria and Pandesara in the last two days. About 26 teams, comprising120 GEB engineers and policemen, conducted the raids in industrial, commercial and residential premises in these areas." News broadcasted on 20th January, 2006 in one of the leading news paper, however, considered it as a just a tip of the iceberg. Likewise, there were hundreds of such raids conducted by Vigilance officers of Gujarat Electricity Board across all over Gujarat to prevent massive power theft.[24] Such power theft eventually led to heavy energy losses to the nation.

As another important development, GEB has set up separate police stations purposefully to deal with power theft cases in Surat, Baroda, Rajkot, Mehsana and Bhavanagar Zones. In effect, these police stations are responsible to

[22] Annual Administrative Report, 2003-2004 page no. 15, 17, & 18 published by GEB, 2006

[23] http://www.gseb.com/innews01.htm

[24] See Annexure-1 depicting a sample of banner used for anti-power theft campaign by GEB

lodge FIR (First Information Report) against those involved in theft of power and material. Eventually, they are accountable for its due processing. This is aimed at expediting detection of culprits and prosecuting them immediately. Besides, 77 Ex. Army persons have been engaged in each zone for protecting GEB staff during checking and disconnection. (See Table 5)

Table – 5 Police Actions to prevent power theft up to the year 2004[25]

Name of Police Station (Zone wise)	No. of FIR Lodged Theft of Materials	Nos. of Person arrested	Professional gang involved in power theft	GEB Employee involved in Power theft
Vadodara	20	31	-	04
Surat	39	42	11	02
Mehsana	08	20	-	-
Bhavnagar	05	266	-	01
Rajkot	NIL	292	-	-

Table – 6 Details of total connections checked, total detection of irregularities in terms of theft, malpractice and others, and Total assessment of the bills issued.[26]

Sr. No.	Particulars	1999-00	2000-01	2001-02	2002-03	2003-04
1	Total Connections Checked	11,95,184	18,98,172	18,73,671	19,66,675	21,47,861
2	**Detection**	**99,535**	**1,55,954**	**1,66,969**	**2,04,174**	**1,07,985**
2A	Theft	40,638	57,158	60,666	79,637	1,07,985
2B	Mal-Practice	22,092	19,149	15,534	14,214	12,408
2C	Other irregularities	36,805	79,647	90,769	1,10,296	93,914
6	Assessment Rs. in Lacs	13,527.16	16,834.64	19,098.76	22,946.78	22,393.24

It is evident from the table that GEB has sternly acted against the culprits of power theft. In FY1999-00, total connections verified to prevent the malpractice were nearly 12 lacs which got doubled over the span of five years.

[25] Annual Administrative Report of GEB, 2003-04, page no. 36 and 37

[26] Ibid.

Overall, it can conclude that over a period of these five years (from 1999 to 2004) almost all the connections have been thoroughly checked.

In FY 1999-00, total 99,535 cases of theft, mal practices and other forms of irregularities have been found. Its assessment was around Rs. 13,527 lacs. This detection went increasing on yearly basis. Almost, 40% to 50% cases were related to power theft, 12% to 25 % to the malpractices and rest of the cases to irregularities. Accordingly, assessment went on rising from Rs. 13 lacs to nearly Rs. 22 lacs from FY 1999-00 to FY 2003-04.

In order to conduct such detection track and timely check of the HT and LT consumers, GEB has identified theft prone areas on the basis of consumption patterns, sensitive industries, and seasonal industries. For constant and vigilant watch on HT consumers - main source of income for GEB, HO has arranged special facility to trace their usage along with other relevant information through computerized consumption pattern. On the basis of this information, the mass drives have been organized with the help of police squad for power theft detection. It is observed that industries like Engineering Units, oil mills, cold storage, Ginning & Processing Mills, Texturing in yarn manufacturing units, Paper mills, Steel Rolling Mills, Hotels, Commercial/Housing Complex, Diamond Cutters, etc. are often found involved in power theft activities.

GEB has put in place a system of responsibility and accountability in the functional domain of checking, investigating, detecting, processing and settling the power theft activities. There were specific and pre-determined targets given in terms of percentage checking of the connections. (Refer Table – 7).[27] The performance of the employees was being broadly measured by the overall achievements of these targets.

[27] Ibid. Page no. 17

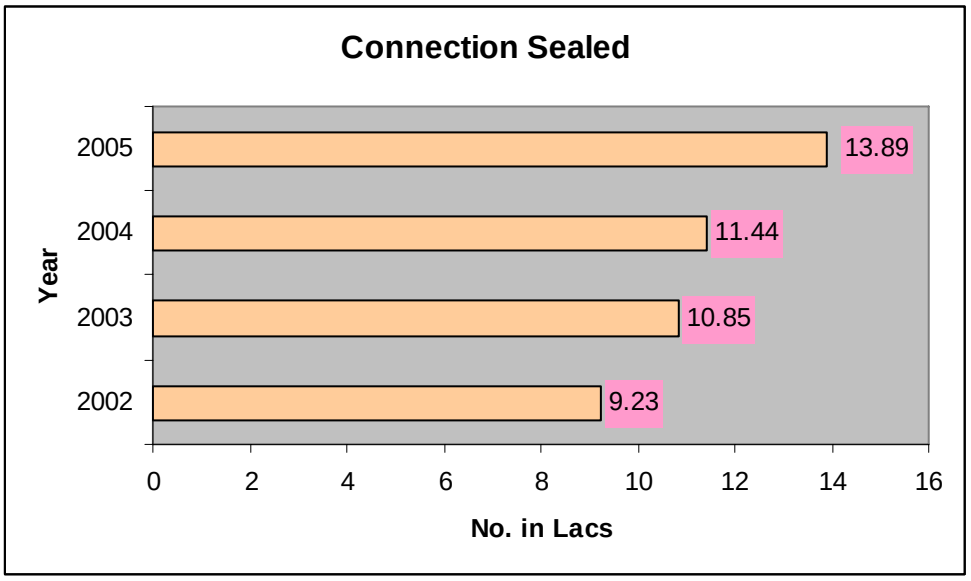
Table – 7 Targets given in terms of consumer category wise % of checking required (Year 2003-04)

Sr. No.	Category of Connection	% Checking Required
1	HT Connection	29.5
2	LT Connection	83
3	Residential Connection	30
4	Commercial Connection	40
5	Agriculture Connection	26

Sealing of Connections

On the basis of the checking and subsequent detection of malpractices, GEB has begun the process of sealing the connections wherein the meter would be sealed and any tampering observed thereafter would be considered as a crime.

Figure – 11 Connections Sealed from FY 2002 onwards



Some customers attempt to manipulate the meter causing it to under-register or to run backwards, effectively using power without paying for it. They excuse this by referring to the increasing costs of energy, perceived corrupt profits or actions of the Electricity Company, etc. This is fraud, illegal in almost all circumstances. Now, in order to protect the company from such acts, meters are usually sealed so that the connections and mechanism cannot be

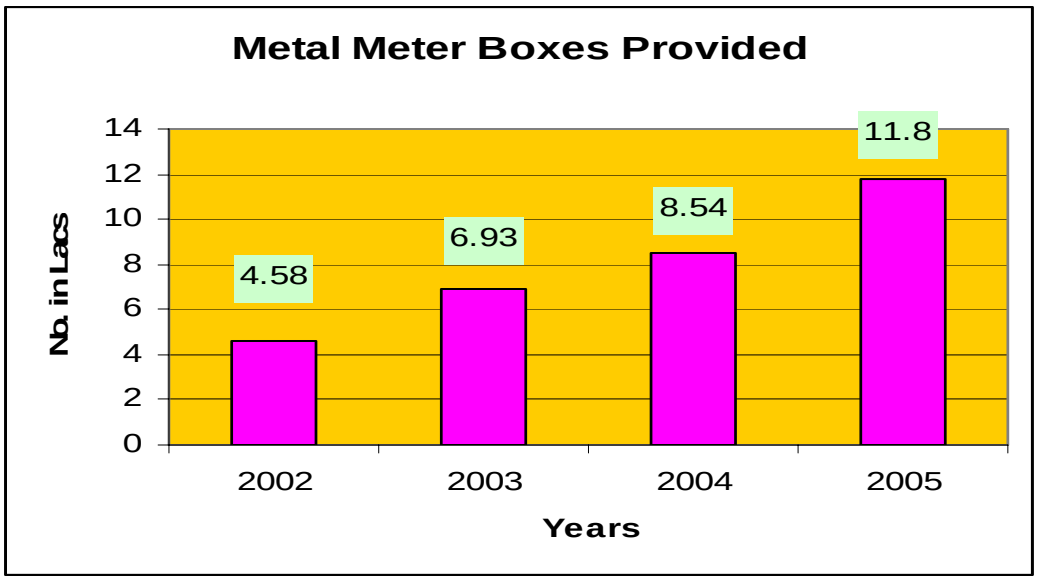
tampered-with without breaking the seal. GEB has set a record in sealing meters to curb tampering with the same. In the year 2002, it sealed 9.23 lacs meters which rose to 13.89 lacs in the year 2005. (See figure - 11)[28]

Provision of Metal Meter Boxes

Gujarat Electricity Board (GEB) has found out a number of defective meters in the due course of detection and sealing process of the meters. Thus it has initiated a replacement of meters. As such faulty meters were generating incorrect reading; it became quite easier even for the low-skilled lineman to tamper with it. Such replacements aided the stoppage of power theft to the great extent.

Further Gujarat Urja Vikas Nigam Ltd.(GUVNL) has initiated reforms in metering by formulating and implementing strict metering code. Basically, Metal Meter Boxes are used for effective energy audit and to control abrupt power theft. It also examines the bi-directional active energy, reactive energy, currents, voltage, reactive power, frequency and other electrical parameters. If it is laded by metal, tampering would become a difficult exercise. In addition, such MMB would be capable to record various parameters required for a particular category of consumers on the basis of tariffs applicable to them. As a result, it is used for better energy audit. Over the span of five years, GUVNL has almost triplicated the use of Metal Meter Boxes (MMB). (Figure - 12)[29]

Figure 12 Metal Meter Boxes (MMB) provided since reformation



[28] Ibid. page no. 35

[29] Adapted from Presentation on GEB reform by Mrs. V.L.Joshi, M.D., GUVNL, Vadodara, 2005

Appellate procedure for settlement of power theft cases

In GEB the arbitrary method of dealing with consumers involved in theft and other irregularities has been well administered. In case of theft of power and malpractice, consumers can now freely approach the appellate cell after making payment of 20% of the amount of supplementary bill issued after found as guilty. An appellate cell is created in each zone which decides the cases having supplementary bill amount to Rs. 3 lacs whereas at Head Office level cases having supplementary bill amount of above Rs. 3 lacs are being trialed.

Interestingly, in order to have speedy settlement of appellate cases bearing an amount up to Rs. 3 lacs, the system of settlement of such cases by way of joint pursuit between zonal appellate committee and consumer has been introduced. According to this system, zonal appellate committees can straight away settle the cases on the basis of three conditions;

1. The consumer should agree to his liability to pay the dues
2. He should be capable to pay 65 % of his dues on an immediate basis and lastly,
3. It should be found acceptable to the board.

Lok Adalat

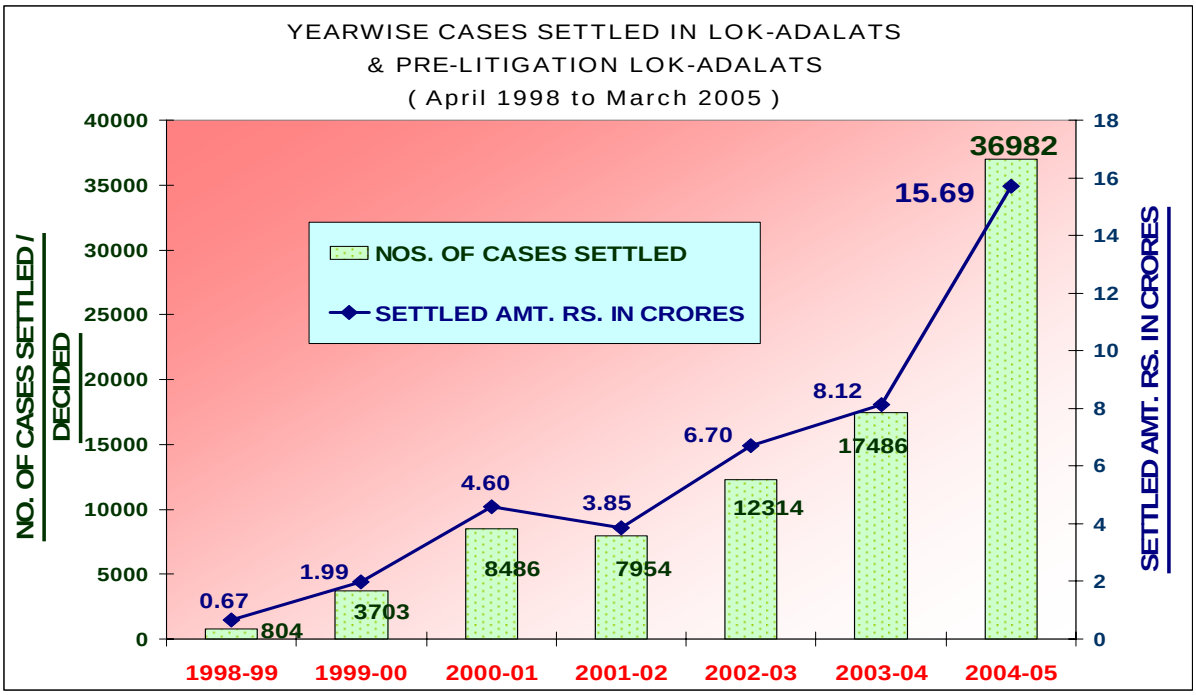
There were large number of pending civil suits relating to power theft and malpractices. Therefore, GEB gave utmost priority and importance to settle pending cases. To resolve, this matter, it had set up Lok Adalat and Pre-Litigation Lok Adalats which not only helped to expedite the justice process but also aided in better revenue realization and reduction of legal expenditure. Regular hearings were held at different places in the state exclusively for the settlement of pending cases of GEB.

During FY 2003-04 GEB had arranged 109 Lok Adalats at various places throughout the State out of which 3518 cases were settled and an amount of Rs. 2.30 Crore had been recovered. In the same year, the board had further arranged 132 Lok adalats and Pre-Litigation Lok Adalats at various locations in which 13968 cases were settled at an amount of Rs. 5.82 crores. Thus, a total amount of Rs. 8.12 Crore had been recovered by the Board during FY 2003-04 through settlement of 17486 cases in Lok Adalat and Pre-Litigation Lok-Adalat.

This highlight of FY 2003-04 is just a peak of the mountain. During FY 2004-05 total amounts realized was about Rs. 15.62 crores by settling 36,982 cases. In fact, since April-1998 to 15th October 2005 total 1, 10,797 Nos. of cases were settled at Rs. 50.82 Crores. (Figure - 13)[30]

[30] Ibid.

Figure – 13 Year wise Cases settled in Lok Adalats



USE OF IT FOR BETTER EFFICIENCY

Geographical Information System

As per the assumptions, it was believed that to make out data relating to power flow from "meter to feeder" was almost impossible. However, this time, it was absolutely proved wrong by GIS. Now, by just a click of a mouse, it is feasible to know where our consumer is, what is his consumption and all details relating to the power flow from "meter to feeder".

The introduction of Geographical Information System (GIS) technology in power management is imperative in the long run for detecting and monitoring power distribution. Through GIS mapping, it can be trapped on a computer screen as to which customer/meter is connected to which pole and the quantity of power flow. The Government of India has taken up the matter enforcing the installation of GIS countrywide to check and monitor power pilferage as per the 11th Plan Approach paper which gives broad inputs for GIS mapping. Hence, Gujarat electricity board has introduced GIS technology for power management initially in certain selected areas. With this, it has now become possible to easily track the offenders. Such offenders will further be checked by anti-theft squad by

conducting surprise raids and penalizing them accordingly. Apart from this, GIS helps in acquiring information related to technical requirements considering no. of transformers working properly, no. of new transformers required and designing or redesigning distribution system.

In addition, GIS reduces time to attend consumer's complaints of "NO" power, minimize time to give new connections, quick fault analysis and identification of low voltage in specified areas. Currently, GIS is operational at Baroda, Bhavnagar and Jamnagar while in Junagadh, Rajkot, Ankleshwar and in Bharuch, GIS installation is in work-in-progress. Gradually, Government of Gujarat is planning to introduce GIS mapping in all over Gujarat.

Enterprise Resource Planning

Enterprise Resource Planning (ERP) is the broad set of activities supported by multiple module application in order to manage business. Its applications are a collection of readymade software modules for different business processes. GEB has, in fact, rolled out the project of ERP in March 2006. However, it is the first Electricity Board in India adapting ERP solution. The total project is envisaged to be completed by December, 2007. Tata Consultancy Services (TCS), a leading Information Technology Enabled Services (ITES) company, has been assigned the task of designing, installing and implementing the ERP system for GEB.

In brief, it aims at substantial reduction in paperwork through online documentation and approval process. It is envisaged to provide better customer services by having consumer billing and payments data in digital form. It expects to build system planning and analysis by network analysis, demand side management, asset management etc. The most importantly, it will promote better inventory management by way of quick disposal of scrap through online scrap auction procedures and disposal process, which would, in turn, facilitate the quick recovery of invested fund that remained idle in scraps. Besides, it is expected to assist in inventory tracking and management by Transfer of Stock instead of new procurement. Finally, ERP will lend a helping hand to GEB by providing data security and user specific rights as well as responsibilities.

SIGNIFICANT IMPROVEMENT IN CASH COLLECTION

Cash collection has been a major headache for the electricity boards all over India. With the introduction of stringent measures to achieve operational efficiency and reduction of technical and commercial losses especially in power pilferage, a brave effort was required to realize the dues of the consumers on speedily and timely basis. Utilization of information technology or specifically speaking Global Information System (GIS) (Restricted to only Baroda, Bhavnagar, Jamnagar, Rajkot, Surat, Mehsana, Anand, Bharuch and Junagadh City) has enabled to set up

1. spot billing with handheld machines,
2. online data monitoring
3. Connection between head office (HO) and other divisions through Wide Area Network (WAN).

In rural areas, post offices were assigned the duty of doorstep collection of bill amount. (9000 post offices were assigned the task of collecting bills). Additionally, 1000 cash collection windows of GUVNL were set up to improve its collection efficiency at 98.71% in 2004-05 (Figure - 14)[31]

Total collection vis-à-vis assessment has increased from 93.81 % in FY 2003-04 to nearly 99% in the next year, 2004-05. To its surprise, the board has achieved the highest record of monthly collection of Rs. 1015 Crores in July, 2005. Interestingly, its average monthly collection was Rs. 955 Crores in the Financial Year 2005-06 which has grown by Rs. 105 Crores as compared to previous FY 2004-05[32].

Billing activities of Gujarat Electricity Board have been outsourced to private agency manned by experts in billing functions in order to reduce the cost of operation and attain greater efficiency and precision in all billing activities. GEB pursued the initiative of pilot project outsourcing the billing activity and accorded its approval to it for LT Consumers of all sub-divisions of Rajkot City, Jamnagar City and 3 Sub-Divisions of Surat Circle.

[31] Adapted from Annual Administrative Report of GEB,2001-02, 2002-03 and 2003-04,

[32] Ibid.

Figure – 14 Collection Efficiency of GEB from FY 2000 to FY 2005

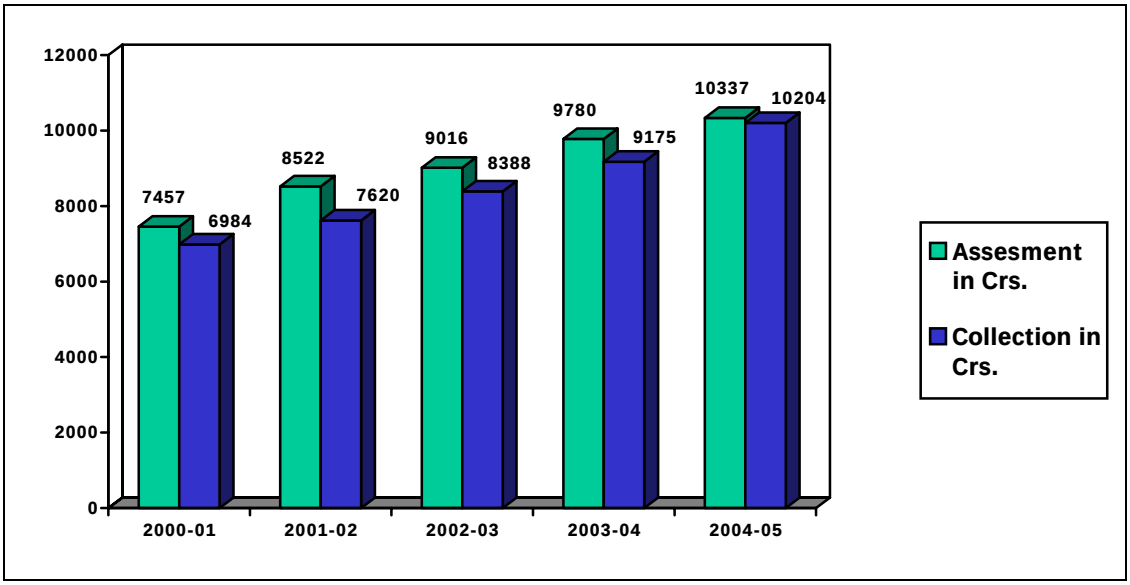
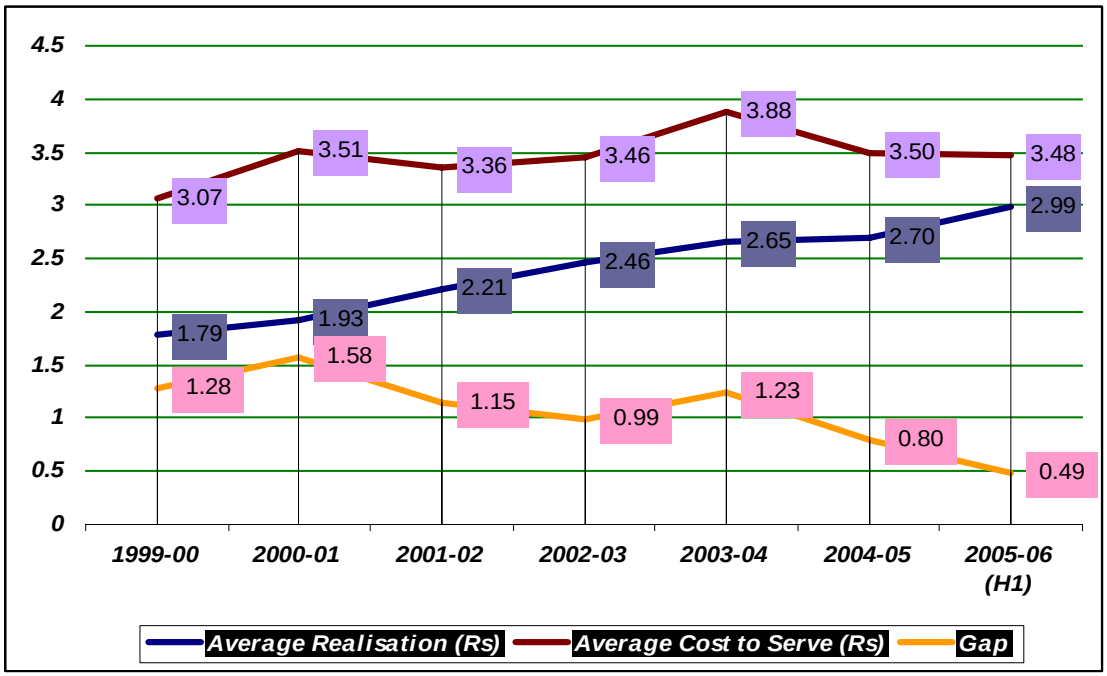


Figure – 15 Average Realization (Rs. in Crores), Average Cost to Serve (Rs. in Crore) and Gap



Due to continuous efforts of the board to enhance its collection efficiency since Financial Year 2001-02, the average realization is found to increase at the compounded annual growth rate (CAGR) of 10.81 % from 1999 to 2006 whereas its average cost to serve the customer increased with relatively slower pace with CAGR of only 1.81 %. This development led to reduction in per unit gap by Rs 1.23 per unit in 2003-04 to Re. 0.49 per unit in 2005-06. (See Figure -15)[33]

[33] Adapted from Presentation on GEB reform by Mrs. V.L.Joshi, M.D., GUVNL, Vadodara, 2005

HUMAN RESOURCE MANAGEMENT IN GEB

Organizational restructuring has its own challenges in the corporate world. With the unbundling of GEB into separate entities on functional basis, the most crucial threat was smooth transition in terms of human resource management from Board to Companies. In 2003-04, GEB had entered into tripartite agreement with Employee's Union and State Government whereby the modalities of transferring employees to the successor entities due to enactment of Electricity Act, 2003 and Organizational Restructuring (unbundling) were decided and later on implemented successfully.

In fact, the employees were given several options relating to selection of entity, of workplace and were given time of six months for the same. A detailed communication exercise was undertaken by top management with each individual employee on regular basis. However, change of organization, name and location never guaranteed the change in working style, culture and efficiency. In order to facilitate the employees to adapt an easy change, GEB had undertaken thorough training programme for employees in transformation management.

GEB is such an organization where on an average 48,000 employees have been working since 1994-95 and catering services to millions of consumers. If we look at the manpower status and their efficiency, we will find mainly four trends (See Figure - 16) [34]

Manpower Efficiency

Over the span of last 10 years from FY 1994-95 to FY 2004-05, the total strength of the employees remained almost stable. Specifically, the numbers of employees have found marginal increase of around 3000 for the first 5 years that is from 1994-95 to 2000-01. (See Figure 16) Then onwards, the strength faced downward trends and today it stands with around 47000 employees. While, we have compared the strength to the increased number of consumers, it has been found that number of consumers per employee is also increasing. It was 124 consumers per employee in FY 1994-95 which rose to 174 consumers per employee exactly after a decade. (See Figure - 16).[35] In addition, the revenue per employee has also increased from Rs. 6 lacs to Rs. 18 lacs over the period of last ten years at the compounded annual growth rate of 11.61 %. All these are the indicators of better utilization of human assets and rise in efficiency of GEB.

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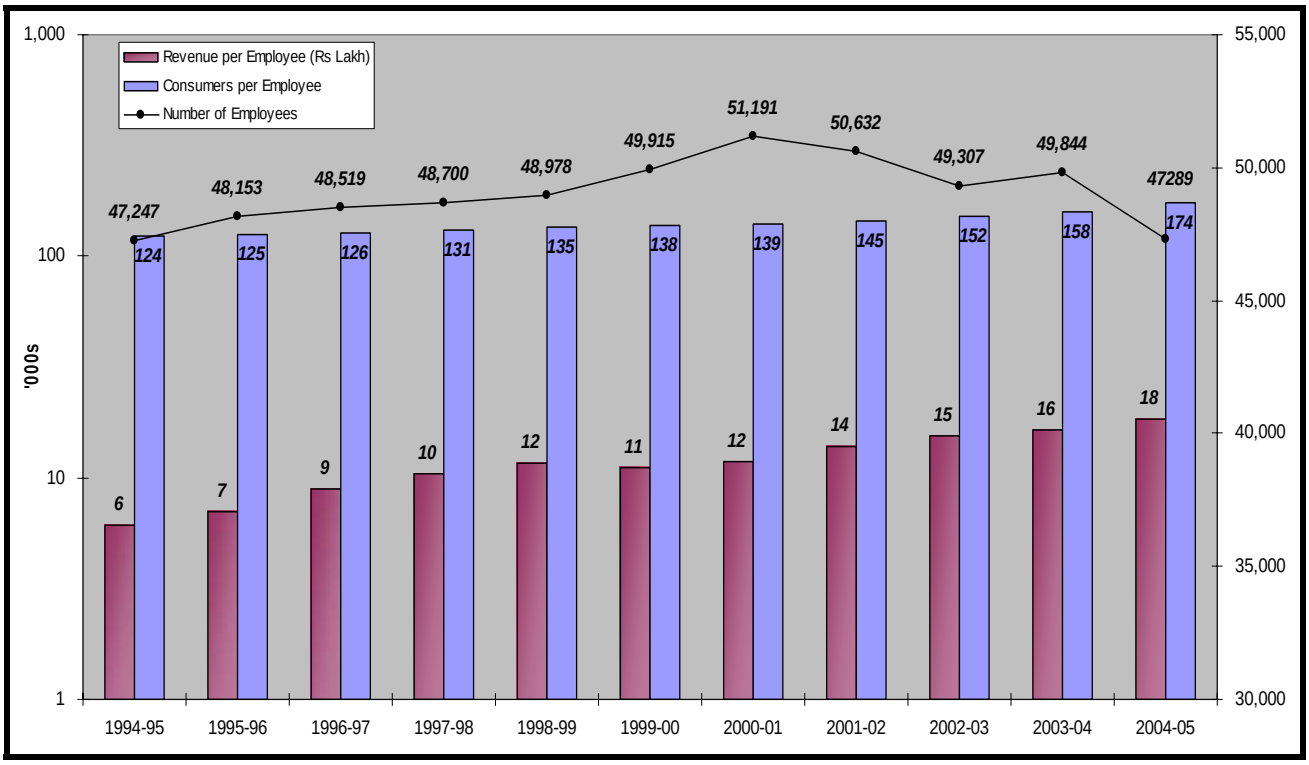
[34] Ibid.
[35] Ibid.

Figure – 16 GEB Employee Efficiency from 1994-95 to 2004-05



Training and Development of Employees

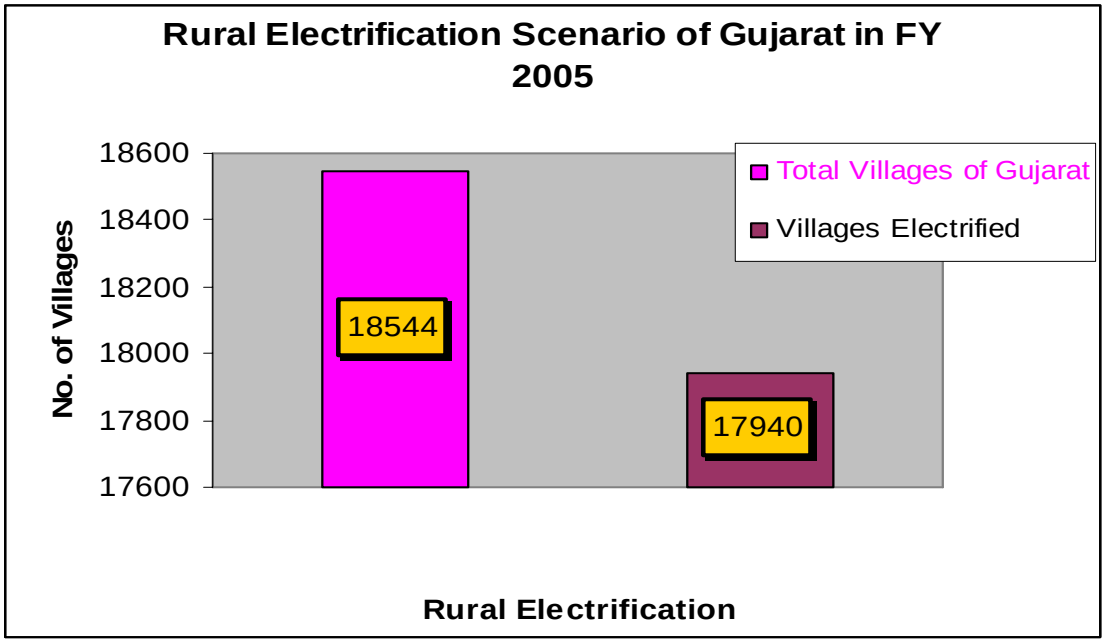
In an electricity company, training requirements are highly diversified since a number of functional units exist manned by varied kind of people. The major thrust areas of the training of GEB employees have been consumer orientation, team and leadership skills, tariff structure analysis, financial training for non-finance executives and simulator training. Generally, the training period for all such areas was for 3 to 5 days. In FY 2003-04 and 2004-05, nearly 13000 and 16,443 employees respectively were trained in the above stated areas which made half of the workforce highly skilled in their respective areas of operation. In addition, GEB is developing Management Development Institute at Gotri, Baroda which will be operational by the end of 2006.

RURAL ELECTRIFICATION

Rural electrification has remained the major constraint for overall rural development of India in general. However, Gujarat has spent a good quantum of efforts to tide over the problem of sluggish rural electrification. Actually, rural electrification refers to the process of electrification of rural hamlets, agriculture wells/tube wells, Schedule Caste and Dalit localities. The programme of rural electrification is by and large carried out by the respective state electricity board, notwithstanding financial supports, being provided by Rural Electrification Corporation Ltd. – a central government company under Ministry of Power mandated to provide financial support for rural electrification throughout India.

In Gujarat, according to Census, 2001 total number of villages in Gujarat are 18544. In FY 2005, the total number of villages electrified stood at 17940. It clearly demonstrates that **96.74 %** villages are completely electrified. (See Figure - 17) The remaining 604 villages are non feasible on account of either going submergence under various dam projects, or having no population at present or lying under thick and reserved forest area declared by the Central Government.

Figure – 17 Rural Electrification of Gujarat in FY 2005



However, rural electrification doesn't mean merely providing power lines to the rural dwellings. It invariably includes continuous power supply at the required voltage and frequency since the quality of villager's life could be

affected due to non availability of power supply in rural areas. In order to provide continuous three phase power supply to rural areas for development of rural population and increase in their standards of living, Government of Gujarat has introduced a unique scheme named "JYOTI GRAM YOJANA"(JGY)[36]. This has affected the villages in development of Education, Industries, Business, and Health Services etc. All round development of State can be achieved by providing 24 Hrs. power to rural areas. Thus, JGY scheme envisioned making the life of millions of village people happier, progressive and prosperous by ensuring quality power supply.

Under Jyotigram Yojana nearly 12,500 villages of Gujarat have been covered. The main feature of JGY is the segregation of agricultural load from existing rural feeders which were provided power supply to both – agricultural area and rural hamlets. Now, these feeders are supposed to facilitate electricity supply to only agricultural area. New feeders have been laid down to cater loads of villages. In those villages nearly 31,589 kms of 11 KV network was laid down and 6124 transformers centers were erected. In common parlance, such wide network and large number of transformers have been set up to install separate distribution line of 11 KV catering the power supply requirements of only rural areas. In addition, in order to maintain support to such distribution lines, 3429 Kms. Of LT (Low Tension) network was laid down. Total cost of the whole project was Rs. 681.34 Crores.

Benefits visualized under JGY

Such a unique scheme bears several advantages in addition to continuous power supply to rural population such as providing more opportunities of local employment, development of cottage/home industries & small scale industries, provision of better health services & infrastructure facilities. Now, onwards the power supply will be available to villagers at the peak of an hour. It will help students for computer education & for preparing other examinations. It may seem very odd; however, we can not deny the fact that rural housewives will be able to use electrical appliances like, grinder, mixers, fridge, etc. and thus improve their standards of living. Moreover, continuous power supply will aid rural population to satisfy their entertainment needs in a better way since TV, VCR, VCD & local/ national/inter national news/entertainment channels will be available which in turn would uplift the village environment. Last but not the least, migration from rural to urban areas will be reduced because of better employment, education and entertainment in rural areas.

[36] http://guj-epd.gswan.gov.in/epd_jyotiyojna.htm

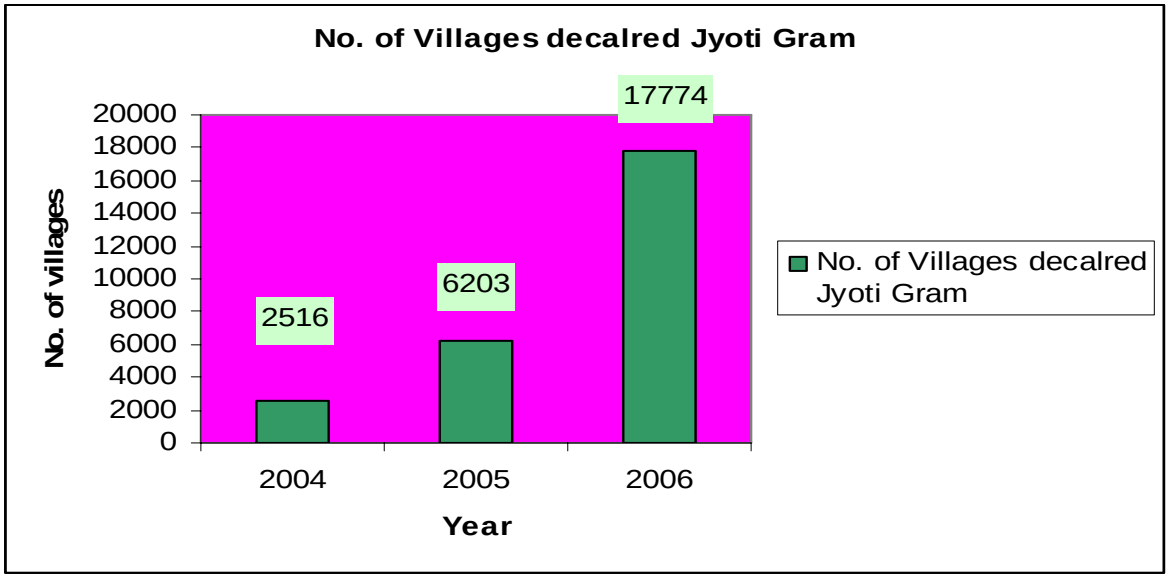
Norms of the scheme for successful execution

Community participation is a key to success for any developmental scheme designed by government. Here, GEB has looked forward the same principle for the successful execution of the Jyoti Gram Scheme. It includes certain norms like registration fee of Rs. 1000/- for a village Panchayat whoever interested to take the benefits of JGY. In addition, the village Panchayat has to pay 30 % of the estimated cost or Rs. 25000/- , whichever is more as a contribution towards JGY, and balance 70% will be met by Govt. of Gujarat. It ensures the participation by way of financial contribution from the proceeds of the revenue of the Panchayat collected from the villagers as part of local taxes and other charges. However, 11th central finance commission (EFC) has confirmed that it will be providing grant up to 75% of estimated cost of feeder.

Achievement and progress over the years

In year 2003-2004, 2516 villages were covered under the scheme and an amount of Rs. 72.18 Crores was alloted. During year 2004-05 budget provision was made of Rs. 257.15 Crores and 6203 villages were covered till march-2005. (See Figure - 18)

Figure – 18 No. of Villages covered under JYOTI GRAM YOJANA



During the current year 2005-06, up to June -2006, there were 17774 villages (almost each and every village of Gujarat) declared as Jyotigram villages where continuous (24 hours) supply of electricity is being provided with the adequate load.

FINANCIAL RESTRUCTURING

Government of Gujarat has successfully attempted the financial restructuring plan. It has passed the Gujarat Electricity Industry (Reorganization and Regulation) Act, 2003 to reorganize the board into seven entities as mentioned earlier. Subsequently, on December 31, 2004, the Government of Gujarat vide its notification has notified the provisional opening balance sheets of the successor (unbundled) entities as on 1st April, 2004. All unbundled entities have also started functioning independently with effect from 1st April, 2005.

In order to ensure the optimum functioning of the independent entities, government of Gujarat (GoG) has prepared the Financial Restructuring Plan (FRP).

According to this plan, GoG has taken over the debt payment liability of Gujarat Electricity Board (GEB). It has settled all the dues payable to Central Public Sector Units (CPSUs) by to 30.09.2001 and in lieu issued Bonds to various CPSUs. (Table - 8)[37]

Table – 8 Dues settled with CPSUs up to 30.09.2001

No.	Name of the Company	Rs. in Crores
1	NTPC	837.24
2	PGCIL	70.04
3	NPC	368.95
4	SECL	351.48
	Total	**1627.71**

[37] Adapted from Presentation on GEB reform by Mrs. V.L.Joshi, M.D., GUVNL, Vadodara, 2005

This payment to CPSUs, since then has been regularly made through Letter of Credit (L/C) without having any further bumps on the road resulting in zero outstanding dues payable to any of CPSUs.

In order to appraise and encourage regular payment of dues, CPSUs have provided incentives to GEB. (Table -9)

Table – 9 Periodic Incentives provided by CPSUs to GEB for timely payment of Dues

Period	Incentive Amount (Rs.in Crs)
1.04.02 to 30.09.03	141.42
1.10.03 to 31.03.04	40.72
1.04.04 to30.09.04	32.57
1.10.04 to 31.03.05	32.57
1.04.05 to 30.09.05 (expected)	32.57
1.10.05 to 31.03.06 (expected)	32.57
TOTAL	**312.42**

Furthermore, Government of Gujarat has converted its loan aggregating to Rs. 623 crore into Equity shares in Gujarat Urja Vikas Nigam Limited (GUVNL). Hence, it is actually turning the role of state government from creditor to the owner of the entity.

Taking into account the fact that GEB had almost lost the chances to make a quick transformation, a timely help by Government of Gujarat in form of lenient approach concerning the recovery of interest payment has proven to be a piece of cake for GEB. As a natural corollary, the GoG has sanctioned the moratorium period of six years (FY 2006-2011) on interest payment liabilities on the outstanding GoG' loan of Rs. 842 Cr. However, the deferred interest is liable to be paid after FY 2011. The underlying idea behind the moratorium period is to have an early recovery of financial health of GUVNL or erstwhile GEB.

Finally, Government of Gujarat has sanctioned the capital grant of Rs. 250 Cr. Per annum from FY 2006-2011 in order to strengthen the power sector of Gujarat. Such grants can be easily utilized for capital expenditure purposes, rural electrification projects, maintenance of quality human resources and expansion of generation capacity. Thus, in this regard, GoG has committed to grant total Rs. 1500 Cr. over the period of six years (2006-2011). According to Mrs. Joshi, MD of GUVNL, such efforts will lead to restructuring of high cost loans and interest saving of Rs. 824 Crores over a period of 7 – 10 years.

All in all, it is very difficult to deny that Government of Gujarat has accorded the parental outlook towards GEB as far as financial restructuring is concerned notwithstanding the urgency to change the power scenario in Gujarat.

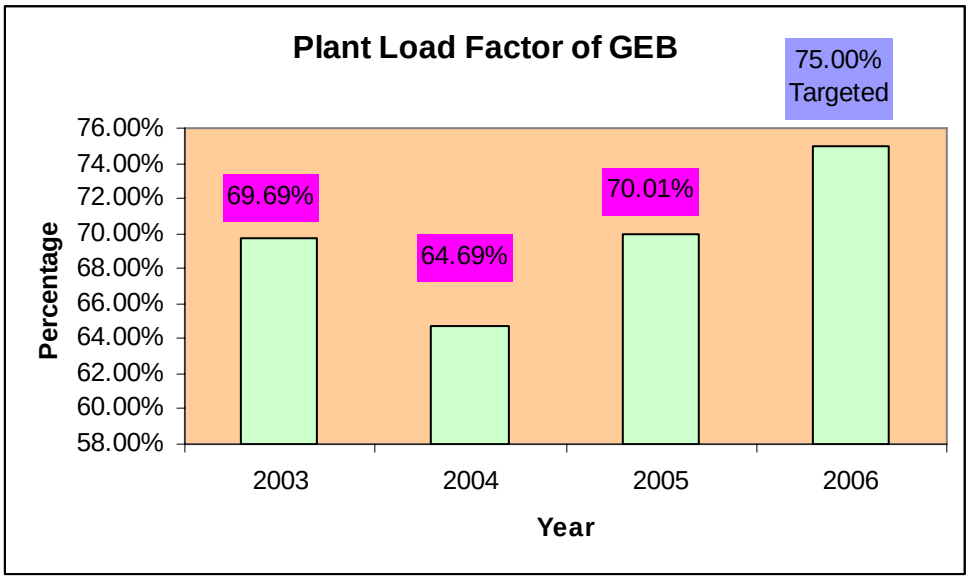
RESULTS ACHIEVED DUE TO REFORMS OF GUJARAT ELECTRICITY BOARD

Apart from outcomes and achievements mentioned earlier, the Board has made rapid strides in the following areas of operations which led to a historical transformation of a public sector unit.

a. Reduction in T & D losses

On account of continuous efforts of GEB officials to cut down the transmission and distribution losses, the board was able to achieve significant improvement in plant load factor over the last three years. (Figure-19). Here, Plant load factor is the measure of efficiency of a power plant.. The load factor is the ratio between the energy that a power plant has produced over a considerate period and the energy that it could have produced at maximum capacity under continuous operation during the whole period.

Figure - 19 Plant Load Factor over the last three years

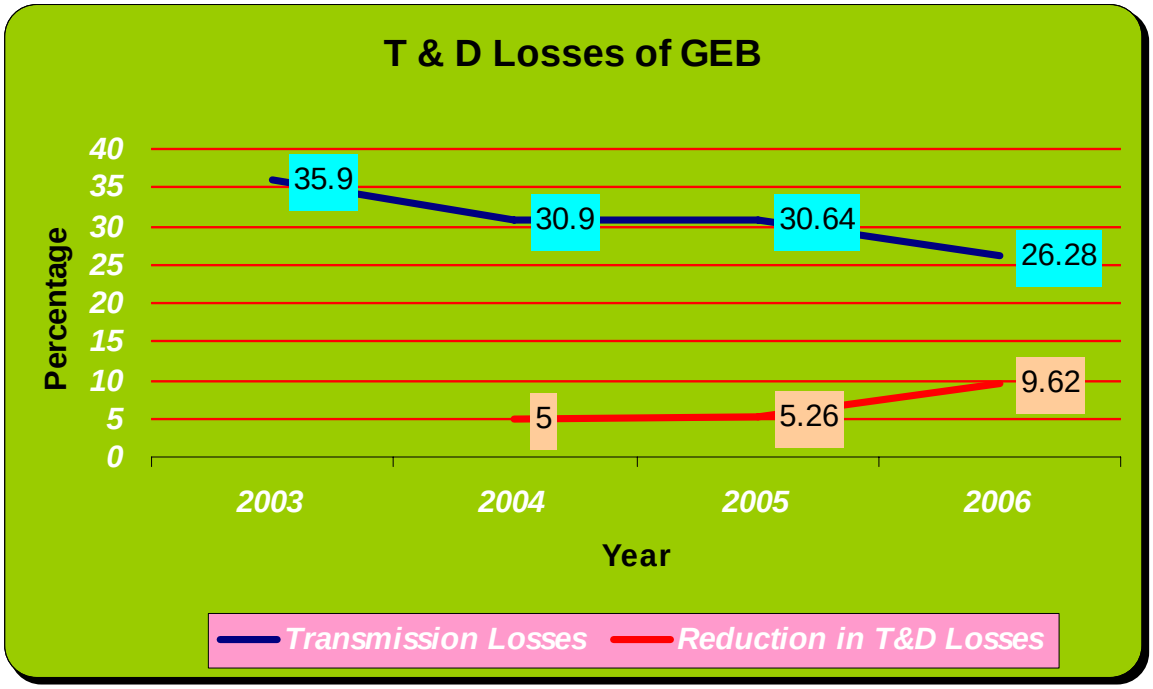


The load factor is appropriate as a performance indicator for power plants as far as they are used exclusively for base load operation. GEB has continuously strived to enhance its PLF. In year 2004, PLF was 64.69 % registering the decline of 5 % as compared to its previous year, 2003. However, in 2005 PLF reached to 70.01 % which is considered as a remarkable achievement.

The increase in plant load factor, change of obsolete equipments, cut in power theft and better energy audit resulted in the increase of transmission and distribution efficiency and reduction of nearly 5 % to 9 % in overall transmission and distribution losses. (Figure - 20).

In FY 2002-03, the T&D losses is 35.9 % of the total electricity generated which declined to 30.9 % in the next fiscal year 2003-04. It remained almost stagnant in the FY 2004-05. However, it declined to 4.36 % in the financial year 2005-06 which cumulatively reduced transmission and distribution losses by 9.62 % over the period of four years. On an average from the (**Figure 20),** it is evident that T&D losses are declining and its declining growth rate is amplifying every year.

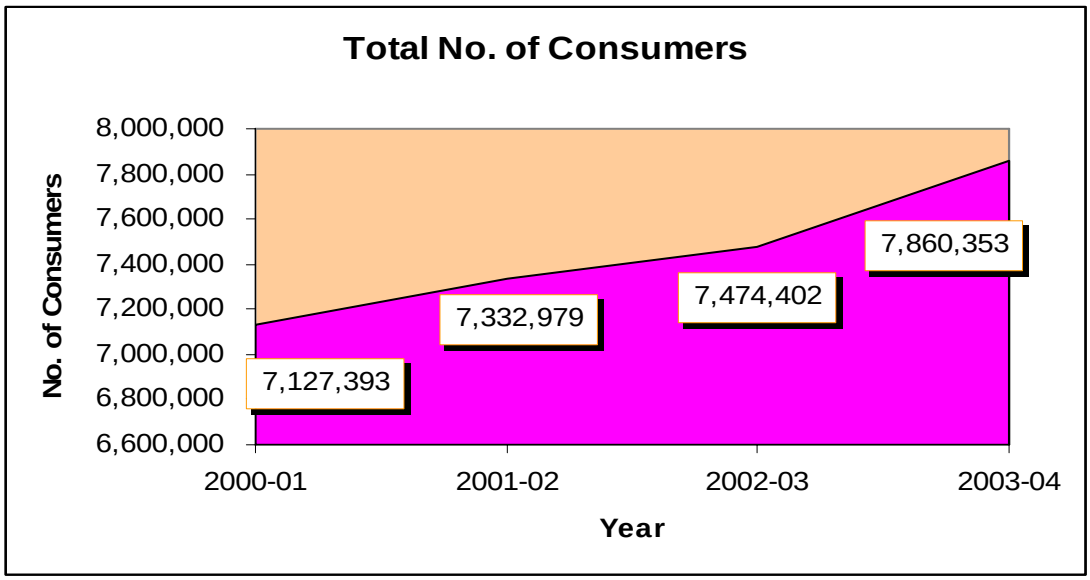
Figure – 20 T & D Losses of GEB from FY 2003 to FY 2006



b. Increase in sales of electricity

Gujarat Electricity Board has made a quantum jump in terms of sales over the span of four years starting from FY 2000-01 to 2003-04. **Figure – 21** reveals the trend of rising level of customer base which was lengthened due to increase in demand of electricity, massive rural electrification efforts, identification of unauthorized connections and subsequent registration of the same connections as customers and renewed thrust of controlling the power theft. At last, over the four year, the consumer base of GEB has been expanded at the compound annual growth rate of **2.48 %.**

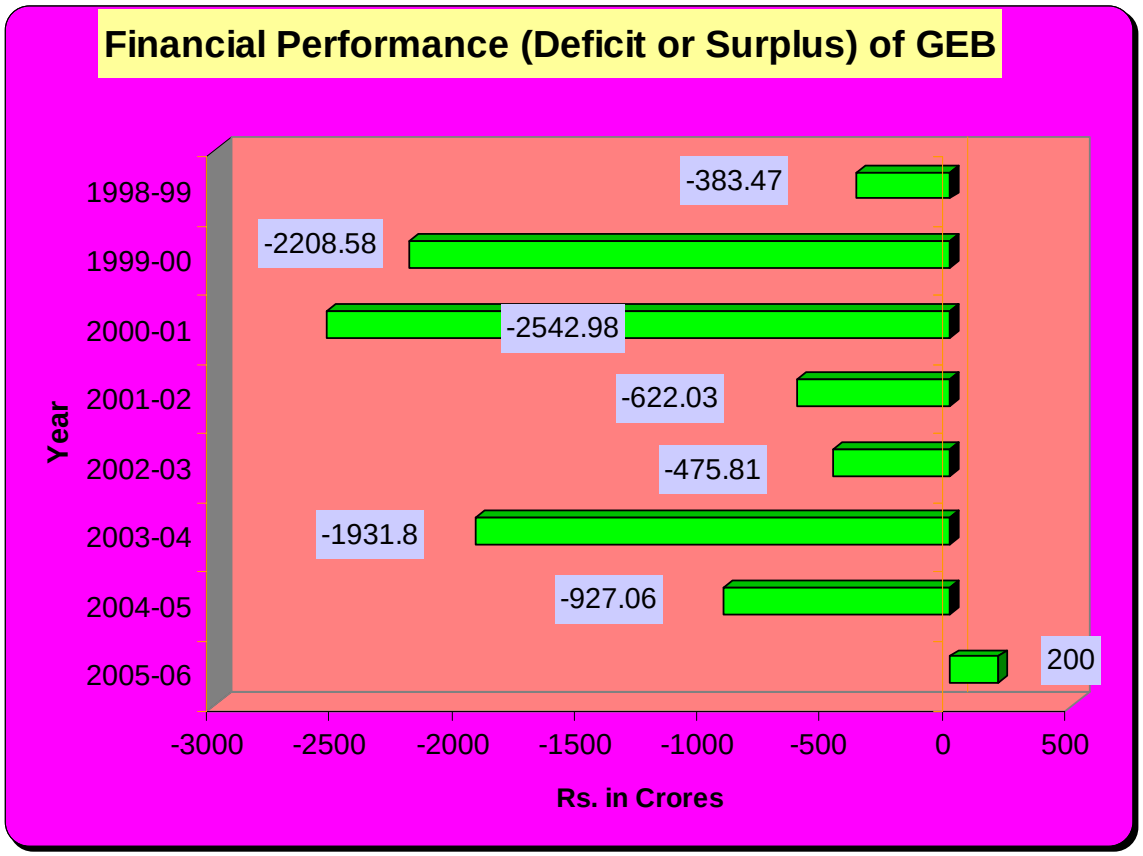
Figure – 21 Total No. of Consumers of GEB from 2000-01 to 2003-04



c. Improvement in Financial Performance

Financial performance is the vital indicator of efficiency in an organization. Financial health of erstwhile GEB

Figure – 22 Net revenue (Deficit) Position of GEB since 1998 to 2006



was in doldrums since last decade especially, after 1997-98.[38]. Earlier than financial year 1998-99, revenue deficit or financial loss hardly appears on the balance sheet of GEB. Situation was worsened since 1998-99 when the losses of aggregating Rs. 3834.7 Crore were came into view. It went on increasing due to higher operating cost and lower operating revenue. It reached to Rs. 2542.9 Crore in 2000-01. Major reasons for higher operating costs were surmounting transmission and distribution losses due to increasing power theft by HT/LT consumers, low collection efficiency, technological obsolesce and lack of political will to bring the culprits to the book. In fact, its assets (fixed assets as well as current assets) have been mostly financed by funds, contribution, grants and subsidies from state government or central government. Their capital liabilities and payment due on them have been surmounting year-on-year basis. In fact, it has been borrowing money to finance its working capital. On the other hand, its receivables against supply of power have been heavily accumulated. In short, it was totally in lost. However, these trends were eye-opener for the policy makers; few of them took up the reins to correct the situation and chart out the road map to reform GEB. They took stern steps to wipe out lost from the revenue statement of the organization. They successfully implemented all the strategies right from the unbundling of GEB, its subsequent

[38] A part of the data of the above figure – 22 has been extracted from Annual Statement of Accounts 2004-05 page no. F published by Gujarat Electricity Board, Government of Gujarat.

corporatisation, campaign against power theft, introduction of IT Tools to massive rural electrification programme by introducing Jyoti Gram Yojana. As an effect, surprisingly, they have generated profit of nearly Rs. 200 Crore[39] in the Financial Year 2005-06, that too, without increase in tariffs by a single penny. Although the strategies and needs for reforms have been mentioned earlier, I reiterate the fact that political will of the visionary politicians, administrative acumen, precision of working and cooperation of all officials – right from a lineman to M.D. – as well as overall supportive environment by Government of Gujarat has converted this nearly impossible task into a reality.

FUTURE PROJECTION

As per the presentation made by existing M.D. of GUVNL Mrs. Vijayalaxmi Joshi, total future savings will be Rs. 7109 Crore till financial year 2010-11 which would bring the average saving of Rs. 1185 Crore per year from 2005-06 onwards. (Table - 10). Major sources of savings will be reduction of transmission and distribution losses on an average of 4 % through intensive system improvements efforts, reduction in power purchase cost through effective Power Purchase Agreements (PPA) negotiations, reduction in fuel cost, improvement in generation efficiency and reduction in general purchase cost through creation of Centralized Purchase Cell and Proper Inventory Planning. In the end, it is pertinent to say that the total reduction of interest rate is somewhat difficult to lower down due to over exposure of debts; the projected decline in the interest cost will lead to total saving of Rs. 223 crore cumulatively over the coming five years.

Table – 10 showing savings due to reforms over the period of FY 2005-06 to 2010-11[40]

Incremental Reforms Generated Savings (Rs. in Crores)							
Year	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**Total**
Power Purchase Cost Reduction	296	295	294	293	292	291	1761
Reduction in general purchase cost	12	13	14	14	15	16	84
T & D loss reduction	471	556	603	711	686	634	3661
Improvement in Generation Efficiency	24	35	78	98	114	161	510
Fuel Cost reduction	124	124	137	149	162	174	870
Reduction in Interest Cost	45	44	42	38	29	25	223
Total Savings	**972**	**1067**	**1168**	**1303**	**1298**	**1301**	**7109**
Average Savings Per Year							1185

[39] http://www.thehindubusinessline.com/2006/06/13/stories/2006061303680300.htm

[40] Adapted from Presentation on GEB reform by Mrs. V.L.Joshi, M.D., GUVNL, Vadodara, 2005

CONCLUSION

Reformation of erstwhile Gujarat Electricity Board which is now, Gujarat Urja Vikas Nigam Ltd (GUVNL) has become a feather in the cap of "Panchamrit"[41] - Gyan Sakti (Education), Raksha Sakti (Defence), Jal Sakti (Water resources), Urja Sakti (Electricity) and Jan Sakti (Community development), envisaged by Hon. Chief Minister Narendra Modi in order to put Gujarat on the higher trajectory of growth and development.

Although power reforms in general, and reform of Electricity Board in particular, was quite critical due to changes in global scenario, it was required to have a mammoth political will where no petition, no pleas, no recommendation and no favor had to be applied. Such political will in turn required tremendous support from the leader and valuable cooperation of the steel frame of bureaucracy. Gujarat Government with its political will, its execution style, and its rock solid determination has transformed a complete dump entity into highly active organization with the hope of great future progress.

However, it is too soon to interpret it as a turnaround of GEB as financial year 2005-06 is the first year when GEB has found a positive bottomline. Having said this, there is no denying of the fact that it is a great milestone in GEB's journey towards success. Let's wait for the turnaround when the common man will be able to enjoy the fruits of GEB's success.

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[41] It is a programme for intensive development five sectors of Gujarat namely education, security (law and order), water resources, electricity and community (human resources) development.

GLOSSARY

ERP – It stands for enterprise resource planning. It is an industry term for the broad set of activities supported by multi-module application software that help a manufacturer or other business manage the important parts of its business, including product planning, parts purchasing, maintaining inventories, interacting with suppliers, providing customer service, and tracking orders.

Feeders - power line that carries power from a generating station to a substation or network.

GIS – It stands for Geographic information system. An organized collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced information.

HT Consumer – High tension consumer means all consumers who obtain supply from the board at higher pressure than 400/440 volts AC three phase 50 cycles. High tension means all voltages higher than 400/440 volts.

Independent Power Producer (IPP) – A wholesale electricity producer that is unaffiliated with franchised utilities in the area in which the IPP is selling power and that lacks significant marketing power. IPPs do not possess transmission facilities that are essential to their customers and do not sell power in any retail service territory where they have a franchise.

KPI - A significant measure used on its own or in combination with other key performance indicators, to monitor how well a business is achieving its quantifiable objectives

KV – It specifies the amount of electric force carried through a high voltage transmission line. In the India, the standard voltage for use in the home is 240 volts. For long transmission purposes, the voltages go as high as 230,000 volts, or even 1,000,000 volts. Sometimes these high voltages are expressed in kilovolts, a kilovolt being equal to 1,000 volts. A 230,000 volt line would be called a 230 kilovolt line.

KWH - The work performed by one kilowatt of electric power in one hour. The unit on which the price of electrical energy is based. A 1000 watt light bulb operating for one hour would use one kWh.

LT Consumer – A low tension consumer means all consumers who obtain supply from the board at 400/440 volts or below. Low tension means all pressure at 400/440 volts DC/AC 50 cycles and below.

MoU – It stands for Memorandum of Understanding. It is a document which, if confirms the other criteria, can be, in law, a contract. Generally, in the world of commerce or international negotiations, a MoU is considered to be a preliminary document; not a comprehensive agreement between two parties but rather an interim or partial agreement on some elements, in some cases a mere agreement in principle, on which there has been accord.

MW - Unit of electrical power equal to one million watts

Plant Load Factor – Plant Load factor refers to the proportion of time which a plant actually produces electricity. A load factor of 50% for a given year, for example, would mean that the plant ran for 4380 hours that year (hours in one year = 8760)

Power Purchase Agreement - It is a contract from a large customer to buy the electricity generated by a power plant or independent power producers

Tariff - The established rate for and specifications of a electricity service

Transformers - An electric device that changes voltage in direct proportion to currents and in inverse proportion to the ratio of the number of turns of primary and secondary windings. The input side of transformer is the primary side. The output low-voltage side is called the transformer secondary. So, it is a device used to increase or decrease electricity's voltage and current.

Transformation - Term used when the poor performance of a company or the business experiences a positive reversal

Unbundling - Restructuring of utilities into component operations: generation, transmission and distribution. Also "unbundling" of consumer bills into price components reflecting charges for each segment of operation

Annexure

Sample of a banner used in anti-power theft campaign conducted by GEB