CHAPTER IV

RESULTS AND DISCUSSIONS
In the questionnaire, the findings from the answers of the respondents reflected the actual experience of reforms. Almost every body asserted that the reforms had made an impact and that they were trying to understand the implications of the reforms.

Earlier, power sector in Gujarat or any state was a state monopoly i.e. SEB - State Electricity Board. So there existed the condition of a purely state monopoly! There was only one player so one sample!!

In the winds of change, the policies were changed with economic liberalization. They were followed by legislation or amendments in the prevailing act. This had remarkable implications and impacts on the power sector companies. Where are the companies? When did we talk about state monopoly? The outcome of policy change process had resulted into the enactment of the Electricity Act 2003, The Gujarat Industry (Reorganization and Regulation) Act 2003, The Companies Act 2000 (Special CSR provision), The Environment Protection Act 1986, The SEZ Act, The UMPP and so on. This has provided consolidated support for reforms. The unbundling of SEB i.e GEB has resulted into 7 unbundled companies with different functions:-

- Generation
- Transmission
- Distribution
RESULTS OF PRIMARY DATA

The results obtained from the researcher’s primary interview and questionnaires are as under in tabulated form:

<table>
<thead>
<tr>
<th>TABLE: 16 IMPACT MATRIX</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Power sector has become more complex and competent in present scenario</td>
</tr>
<tr>
<td>Central government has played a greater role</td>
</tr>
<tr>
<td>It has become imperative to generate financial sources for power companies</td>
</tr>
<tr>
<td>It has come under regulator</td>
</tr>
<tr>
<td>The major driving force for reforms in the Electricity Act 2003</td>
</tr>
<tr>
<td>It is not restricted in the hands of few and more and more players have entered in the field</td>
</tr>
<tr>
<td>Under the influence of globalization, policies of power sector have changed due to reforms</td>
</tr>
<tr>
<td>Necessities of leadership qualities to be transformed and emerging new leaderships in place</td>
</tr>
<tr>
<td>Reform process has opened up more consumer segments in the society</td>
</tr>
<tr>
<td>The changes that have taken place under the impact of the new policy are commercially viable</td>
</tr>
<tr>
<td>Government interference has been lessened</td>
</tr>
</tbody>
</table>
4.1. ANALYSIS OF IMPACT MATRIX

Eleven impacts were identified and agreed upon by competent exports. The respondents were policy makers. They were required to judge each impact using a five point scale ranging from strongly agree to strong disagree. The weighted means were computed for each impact based on percentage distribution of responses.

Accordingly a higher means score would mean that the impact has strongly occurred. Considering this, a weighted mean score for all the eleven impacts ranges from 3.23 to 4.71. Almost all the impact have been judged to have occurred.

For example: Q.1 Power sector has become more complex and competent in present scenario. Most of the respondent have shown their inclination towards strong agreement to agreement

They are desirable impacts and they have been considered so by respondents by acknowledging it. Due to the reforms, power sector companies will certainly improve.
<table>
<thead>
<tr>
<th></th>
<th>Most Desirable</th>
<th>Desirable</th>
<th>Undesirable</th>
<th>Weighted Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Captive generation was freely permitted</td>
<td>65</td>
<td>35</td>
<td>0</td>
<td>2.65</td>
</tr>
<tr>
<td>Reduction in T&amp;D losses and optimization of generation is observed</td>
<td>59</td>
<td>41</td>
<td>0</td>
<td>2.59</td>
</tr>
<tr>
<td>Generation of electricity was made free from licensing</td>
<td>59</td>
<td>35</td>
<td>6</td>
<td>2.53</td>
</tr>
<tr>
<td>There is improvement in consumer services</td>
<td>59</td>
<td>35</td>
<td>6</td>
<td>2.53</td>
</tr>
<tr>
<td>Mandatory purchase of power from renewable sources by distribution licenses</td>
<td>59</td>
<td>29</td>
<td>12</td>
<td>2.47</td>
</tr>
<tr>
<td>Corporatization of GEB would be beneficial to state economy</td>
<td>59</td>
<td>29</td>
<td>12</td>
<td>2.47</td>
</tr>
<tr>
<td>New schemes like demand side management, time of day in tariff collections, energy audits are implemented that are beneficial for the profit of the power companies</td>
<td>47</td>
<td>53</td>
<td>0</td>
<td>2.47</td>
</tr>
<tr>
<td>Promotion is given to captive power &amp; independent power producers</td>
<td>47</td>
<td>47</td>
<td>6</td>
<td>2.41</td>
</tr>
<tr>
<td>Single buyer would be completely abolished</td>
<td>53</td>
<td>29</td>
<td>18</td>
<td>2.35</td>
</tr>
<tr>
<td>Reduction in gross subsidies implemented</td>
<td>41</td>
<td>47</td>
<td>12</td>
<td>2.29</td>
</tr>
<tr>
<td>New rationalized tariff policy is in place now</td>
<td>41</td>
<td>47</td>
<td>12</td>
<td>2.29</td>
</tr>
<tr>
<td>Stand alone generation/distribution of electricity to rural areas was permitted</td>
<td>41</td>
<td>41</td>
<td>18</td>
<td>2.23</td>
</tr>
<tr>
<td>Open access for captive use as payment of wheeling charges can be allowed</td>
<td>53</td>
<td>13</td>
<td>34</td>
<td>2.19</td>
</tr>
<tr>
<td>Consumers given a right to non-discrimination, open access to transmission/distribution network, subject to payment of surcharges</td>
<td>17</td>
<td>77</td>
<td>6</td>
<td>2.11</td>
</tr>
</tbody>
</table>

### 4.1.2 ANALYSIS OF IMPLICATION MATRIX

The power reforms have number of implications which were also implied in the Electricity Act 2003. The same were listed out and rated by respondents using a three point scale, with three indicating that the implication has occurred. The weighted means score was computed for
each implications. Considering the entries in the table, it appears that all the implications have been considered for their desirability and in the opinion of the respondents the implications have been acknowledged. Weighted means score for all the implications range from 2.11 to 2.65 indicating that all the implications have been considered favourably.

**TABLE : 18 STRATEGIC LEADERSHIP**

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Uncertain</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Weighted Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top leadership of power companies will be technocrats in the emerging scenario</td>
<td>50</td>
<td>31</td>
<td>0</td>
<td>12.5</td>
<td>6</td>
<td>4.175</td>
</tr>
<tr>
<td>Appropriate change management must be done by top management professionals</td>
<td>37.5</td>
<td>43.75</td>
<td>0</td>
<td>12.5</td>
<td>6</td>
<td>4.06</td>
</tr>
<tr>
<td>The leadership must be transformatory</td>
<td>37.5</td>
<td>43.75</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>3.985</td>
</tr>
<tr>
<td>Private companies would be benefited by the development of strategic leadership</td>
<td>25</td>
<td>56</td>
<td>12.5</td>
<td>6</td>
<td>0</td>
<td>3.92</td>
</tr>
<tr>
<td>Top leadership of power companies will be bureaucrats in the emerging scenario</td>
<td>6</td>
<td>31</td>
<td>6</td>
<td>31</td>
<td>25</td>
<td>2.84</td>
</tr>
<tr>
<td>There is no need for strategic leadership in the emerging scenario</td>
<td>0</td>
<td>12.5</td>
<td>19</td>
<td>12.5</td>
<td>56</td>
<td>1.815</td>
</tr>
</tbody>
</table>

**4.1.3 ANALYSIS OF STRATEGIC LEADERSHIP**

There are six statements which were identified and agreed upon by the competent experts that, in the light of reforms they desire strategic leadership at the top of power companies. When “the vision -power for all by 2012” was disseminated by Government of India, the role of leadership of power sector was sought to be changed by the respondents. The top priority was given to the strategic leadership with technocratic character, change management, transformation, etc. Most respondents disagreed to non requirement of strategic leadership. Accordingly, higher mean score
would mean that strategic leadership (ie. top notch people in the power sector) is strongly desired by the respondents. The score ranged from 1.815 to 4.175 in the five point scale, from strongly agree to strongly disagree.

### TABLE 19 IMPLEMENTATION OF REFORMS

<table>
<thead>
<tr>
<th>Item</th>
<th>Great Extent</th>
<th>To some Extent</th>
<th>Not at all</th>
<th>Weighted Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unbundling of SEB is done</td>
<td>56</td>
<td>44</td>
<td>0</td>
<td>2.56</td>
</tr>
<tr>
<td>Deciding the completion of focused formation of new companies</td>
<td>37.5</td>
<td>56</td>
<td>6.5</td>
<td>2.31</td>
</tr>
<tr>
<td>New benchmarks for technical functions are set</td>
<td>18.75</td>
<td>75</td>
<td>6.25</td>
<td>2.125</td>
</tr>
<tr>
<td>Business functions are redefined</td>
<td>6.5</td>
<td>81.25</td>
<td>12.5</td>
<td>1.945</td>
</tr>
<tr>
<td>Opening new vistas for knowledge, technology management via training centre</td>
<td>12.5</td>
<td>62.5</td>
<td>25</td>
<td>1.875</td>
</tr>
<tr>
<td>Corporatization of new entities of SEB is done</td>
<td>31</td>
<td>44</td>
<td>0</td>
<td>1.81</td>
</tr>
<tr>
<td>Refreshing of the HR policies is initiated</td>
<td>6.5</td>
<td>56</td>
<td>37.5</td>
<td>1.69</td>
</tr>
</tbody>
</table>

#### 4.1.4 ANALYSIS OF REFORMS IMPLEMENTATION

This table reveals to what extent the implementation of reforms have occurred. A three point scale is devised from great extent to not at all ranging from 1.69 to 2.56. The weighted mean is computed. This indicates that most of the respondents agreed upon the unbundling of SEBs, restructuring and corporatization of unbundled companies, new benchmarks for technology etc. and acknowledged it. This shows positive action has been taken by the Government of Gujarat and reforms process has been fostered further.
### TABLE :20 STRATEGIC ISSUES FOR POWER SECTOR COMPANIES

<table>
<thead>
<tr>
<th>Issue</th>
<th>Great Extent</th>
<th>To Some Extent</th>
<th>Not at All</th>
<th>Weighted Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existence of new entities for competition</td>
<td>54</td>
<td>39</td>
<td>7</td>
<td>2.47</td>
</tr>
<tr>
<td>Restructuring the finance function</td>
<td>54</td>
<td>39</td>
<td>7</td>
<td>2.47</td>
</tr>
<tr>
<td>Change of work culture</td>
<td>46</td>
<td>54</td>
<td>0</td>
<td>2.46</td>
</tr>
<tr>
<td>Change in HR policies</td>
<td>54</td>
<td>31</td>
<td>15</td>
<td>2.39</td>
</tr>
<tr>
<td>Strategic enterprise management</td>
<td>54</td>
<td>30</td>
<td>15</td>
<td>2.37</td>
</tr>
<tr>
<td>Change of corporate policies</td>
<td>38</td>
<td>46</td>
<td>15</td>
<td>2.21</td>
</tr>
<tr>
<td>Tariff rationalization</td>
<td>46</td>
<td>30</td>
<td>23</td>
<td>2.21</td>
</tr>
<tr>
<td>Change in business process</td>
<td>41.6</td>
<td>33.33</td>
<td>25</td>
<td>2.1646</td>
</tr>
<tr>
<td>Change in operations</td>
<td>15</td>
<td>85</td>
<td>0</td>
<td>2.15</td>
</tr>
<tr>
<td>Focus on business function</td>
<td>23</td>
<td>69</td>
<td>8</td>
<td>2.15</td>
</tr>
<tr>
<td>Loss reduction via theft prevention</td>
<td>55</td>
<td>0</td>
<td>45</td>
<td>2.1</td>
</tr>
<tr>
<td>Loss reduction</td>
<td>41.66</td>
<td>8.33</td>
<td>50</td>
<td>1.9164</td>
</tr>
<tr>
<td>Change of regulator</td>
<td>33.33</td>
<td>16.66</td>
<td>50</td>
<td>1.8331</td>
</tr>
<tr>
<td>Consumer classification &amp; segmentation</td>
<td>15</td>
<td>54</td>
<td>30</td>
<td>1.83</td>
</tr>
</tbody>
</table>

### TABLE :21 STRATEGIC ISSUES FOR ENTIRE POWER SECTOR

<table>
<thead>
<tr>
<th>Issue</th>
<th>Great Extent</th>
<th>To some Extent</th>
<th>Not at all</th>
<th>Weighted Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existence of new entities for competition</td>
<td>78.5</td>
<td>14</td>
<td>7</td>
<td>2.705</td>
</tr>
<tr>
<td>Change in business process</td>
<td>66.66</td>
<td>33.33</td>
<td>0</td>
<td>2.664</td>
</tr>
<tr>
<td>Change of work culture</td>
<td>64</td>
<td>29</td>
<td>7</td>
<td>2.57</td>
</tr>
<tr>
<td>Change of corporate policies</td>
<td>64</td>
<td>29</td>
<td>7</td>
<td>2.57</td>
</tr>
<tr>
<td>Tariff rationalization</td>
<td>57</td>
<td>43</td>
<td>0</td>
<td>2.57</td>
</tr>
<tr>
<td>Loss reduction via theft prevention</td>
<td>64</td>
<td>28.5</td>
<td>7</td>
<td>2.56</td>
</tr>
<tr>
<td>Focus on business function</td>
<td>50</td>
<td>50</td>
<td>0</td>
<td>2.5</td>
</tr>
<tr>
<td>Restructuring the finance function</td>
<td>50</td>
<td>43</td>
<td>7</td>
<td>2.43</td>
</tr>
<tr>
<td>Change in operations</td>
<td>35.5</td>
<td>64.5</td>
<td>0</td>
<td>2.355</td>
</tr>
<tr>
<td>Change in HR policies</td>
<td>50</td>
<td>35.5</td>
<td>14</td>
<td>2.35</td>
</tr>
<tr>
<td>Loss reduction</td>
<td>50</td>
<td>35.5</td>
<td>14</td>
<td>2.35</td>
</tr>
<tr>
<td>Change of regulator</td>
<td>50</td>
<td>29</td>
<td>21</td>
<td>2.29</td>
</tr>
<tr>
<td>Consumer classification &amp; segmentation</td>
<td>28.5</td>
<td>71</td>
<td>0</td>
<td>2.275</td>
</tr>
<tr>
<td>Strategic enterprise management</td>
<td>35.5</td>
<td>57</td>
<td>7</td>
<td>2.275</td>
</tr>
</tbody>
</table>
4.1.5 ANALYSIS OF STRATEGIC ISSUES

Strategic Issues for

Organization          Power Sector

The respondents have shown their priorities of the strategic issues for their organization vis-à-vis the power sector. A three point scale could be required to judge the opinion of the respondents by computing weighted means ranging from 1.83 to 2.47 for power sector organization and 2.275 to 2.705 from great extent to not at all for power sector.

The respondents acknowledged that the most important strategic issues for their organization were,

i) Existence of new entities for competition
ii) Restructuring the finance function
iii) Change of work culture
iv) Change in HR policies
v) Strategic enterprise management

And same respondents acknowledged for power sector,

i) Existence of new entities for competition
ii) Change in business process
iii) Change of work culture
iv) Change in corporate polices
v) Tariff rationalization.

But one thing could be clearly seen that all the respondents acknowledged all the identified issues. And all fourteen issues were judged as strategic issues.
### 4.1.6 ANALYSIS OF LEADERSHIP QUALITIES

Ten leadership qualities were identified and they were required to be ranked in order of their desirability. The rank from one to ten shows the alchemy of the leader. Professional qualification, knowledge of the subject, the strategist, problem solver, experience in management are the most desired qualities for the leader as per the acknowledgement of the respondents by the ranks. This is in turn might be making of the strategic leader.

### 4.2 OBJECTIVES OF RESEARCH WORK

Objective I: To examine the Nature and scope of policy changes in policies pertaining to the power sector

Objective II: To identify implications of the changes for power sector companies in the light of reforms

Objective III: To explore the problems and issues faced by Power Sector Companies

Objective IV: To examine the responses of power sector companies to gear up to the changing needs

Objective V: To identify Strategic Issues and Future Scenario of Power Sector in Gujarat
4.2.1 Objective I: The Nature and scope of policy changes and the reforms

In Indian Scenario 'Power' was a monopoly of central and state Government. Therefore, to meet the demand of the consumers, mainly the industry and society, it was implied to reform the power sector. The respondents of the studies have equivocally agreed to the positive impact of the reforms and have witnessed the change in the power sector.

From our study what have we understood about the 'Reforms'?

Reforms:
Reform is improvement or amendment of what is wrong, corrupt, unsatisfactory

➢ To change to better state, form
➢ To abandon wrong or evil ways of conduct.
➢ Amendment of conduct
➢ Improve by alteration, substitution, abolition\(^1\)

Reforms - Asian context\(^2\)

➢ Increase availability of power
➢ Improve quality of power
➢ Enhance investment in power sector
➢ Create healthy competition
➢ Improve efficiency
• Generation
• Transmission
• Distribution

➢ Cost recovery
➢ Training and Development of human resources

Reforms - Developed world context

➢ Excess availability of power
➢ High cost of electricity
➢ Need for competition
➢ Quality improvement for digital age
  - Electric power to meet the need of the digital society
  - Security, reliability and availability
➢ In conventional system
➢ Reliability in the range of two nines to six nine.
➢ For digital society desired reliability level nine-nines (99,9999999)

Table: 23 Availability of Power in Different Systems

<table>
<thead>
<tr>
<th>SYSTEM TYPE</th>
<th>AVAILABILITY %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managed</td>
<td>99</td>
</tr>
<tr>
<td>Well managed</td>
<td>99.9</td>
</tr>
<tr>
<td>Fault tolerant</td>
<td>99.99</td>
</tr>
<tr>
<td>Highly available</td>
<td>99.999</td>
</tr>
<tr>
<td>Very highly available</td>
<td>99.9999</td>
</tr>
<tr>
<td>Ultra highly available</td>
<td>99.99999</td>
</tr>
</tbody>
</table>
Public perception of reforms in Asian Power Sector

- Privatization
- Costly electricity
- Employee retrenchment
- Government abdicating responsibility for universal supply obligation
- Rural electrification is the casualty because of "cherry picking" of urban areas.

The Role of Reforms:

- Improve productivity of Electricity Industry
- Promote Energy efficiency thereby enhance environmental protection
- Promote transparency in decision making
- Attract foreign investment
- Increased private participation
- Privatization to instill financial discipline
- Transfer commercial risks from public to private investors
- Ease pressure on the financially constrained Governments thereby allocate scarce capital for improving health, education and other basic services.3

This has revealed the complete chain of changes that are made in policies followed by legislation or amendment in the prevailing Acts.
This was mostly based on the secondary data in addition to the questions on the reform and the personal interview with the policy makers.

The National Electricity Policy:


Aims and objectives of NEP:

- Access to Electricity - Available for all households in next five years.
- Availability of power - Demand to be fully met by 2012. Energy and peaking shortages to be overcome and adequate spinning reserve to be available.
- Supply of reliable and quality power of specified standards in an efficient manner at reasonable rates.
- Per Capita availability of electricity to be increased to over 1000 units by 2012.
- Minimum life - The consumption of 1 Units / household day as a merit good by year 2012.
- Financial Turnaround and commercial viability of electrical sector
Protection of Consumer's interests.

NATIONAL ELECTRICITY PLAN :- (NEPlan)
Assessment of demand is an important pre-requisite for planning capacity addition. Section 3(4) of the Act requires the Central Electricity Authority (CEA) to frame a National Electricity Plan once in five years and revise the same from time to time in accordance with the NEPlan. Also Section 73(a) provides that formulation of short term and perspective plans for development of electricity system and co-ordinating the activities of various planning agencies for the optional utilization of resources to sub-serve the interests of the national economy shall be one of the functions of the CEA. The plan prepared by CEA and approved by the Central Government can be used by prospective generating companies, transmission utilities and transmission/distribution licenses as referred document. NEP seeks to address following issues:-

Rural Electrification

➢ Generation
➢ Transmission
➢ Distribution
➢ Recovery of Cost of services and targeted subsidies
➢ Technology Development and Research and Development (R & D)
➢ Competition aimed at consumer benefits
Financing power sector programmes including private sector participation

- Energy conservation
- Environmental Issues
- Training and Human resources
- Co-generation and Non Conventional Energy Sources
- Protection of consumer Interests and Quality Standards
- The Indian Electricity Rules (IERs) 1956 amended by IER 2006 on 26.1.2006

Tariff Policy: (Resolution No. 23/2/2005 - R & R (Vol. III) dtd 6.1.6)

In compliance with Section 3 of the Electricity Act, 2003 the Central Government notified the Tariff Policy in continuation of the National Electricity Policy (NEP) notified on 12th Feb, 2005.

The NEP has set the goal of adding new generation capacity of more than one lakh MW during the 10th and 11th Plan periods to have per capita availability of over 1000 units of electricity per year and to not only eliminate energy and peaking shortages but also have a spinning reserve of 5% in the system. Households are to be provided access to electricity in the next five years.

The power sector is to be made investment savvy. Therefore, the tariff policy has been evolved in consultation with the State Governments and
the Central Electricity Authority (CEA) and keeping in view the advice of the Central Electricity Regulatory Commission and suggestions of various stakeholders.

Table 24 : Role of Government

<table>
<thead>
<tr>
<th>Section Number</th>
<th>Salient features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 3</td>
<td>• Central government to prepare the National Electricity Policy and tariff policy</td>
</tr>
<tr>
<td>Section 4</td>
<td>• Central government to notify the National Policy for rural areas in consultation with states</td>
</tr>
<tr>
<td>Section 5</td>
<td>• Central government to formulate National Policy in consultation with states for the bulk purchase of power and management of local distribution through user associations etc.</td>
</tr>
<tr>
<td>Sections 107, 108</td>
<td>• Central / state governments to guide Appropriate Commission in the matters of policy involving public interest</td>
</tr>
</tbody>
</table>

Table 25 : Licensing

<table>
<thead>
<tr>
<th>Section Number</th>
<th>Salient Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 12</td>
<td>• License for transmission, distribution and trading mandatory.</td>
</tr>
</tbody>
</table>
| Section 14     | • Appropriate commission to grant license  
• Appropriate commission may grant distribution license to two or more persons within the same area;  
• No license required for generation and distribution of electricity in rural area notified by state government |
### Table 26: Generation

<table>
<thead>
<tr>
<th>Section Number</th>
<th>Salient Features</th>
</tr>
</thead>
</table>
| Section 7      | • Free from licensing; and  
                 • Requirement of techno economic clearance for thermal generation done away with. |
| Section 8      | • Concurrence of CEA required for hydro projects with capital expenditure exceeding limit fixed by central government.  
                 • Necessary due to concern of dam safety and inter-state issues. |
| Section 9      | • Captive generation set up by any person for his own use or by any co-operative society of association of persons for use of its members free from controls  
                 • Open access to captive generation, subject to availability of transmission facility; and  
                 • Surcharge not applicable for captive generation. |
| Section 86 (1)(e) | • Generation from non-conventional sources / cogeneration to be promoted; and  
                    • Minimum percentage of purchase of power from renewable to be prescribed by regulatory commissions. |

### Table 27: Transmission

<table>
<thead>
<tr>
<th>Section Number</th>
<th>Salient Features</th>
</tr>
</thead>
</table>
| Sections 12, 15 (5) (b) | • License required to transmit electricity; and  
                             • Private transmission companies to be licensed by the appropriate commission after considering the views of the transmission utility. |
| Sections 26, 27, 31, 38, 39 | • Load dispatch to be managed by a government company / organization; and  
                               • Flexibility regarding keeping transmission utility and load dispatch together or separating them. |
| Sections 38-40 | • Open access to transmission lines to be provided to distribution licensees and generation companies  
                 • Provision of surcharge to recover current level of cross subsidies  
                 • Surcharge transitional till the cross subsidies are eliminated  
                 • Transmission utility at centre and state to manage and develop transmission system. |
| Sections 27, 31, 38, 39, 41 | • Load dispatch centre / transmission utility / transmission licensee not to trade in power. |
### Table 28: Distribution

<table>
<thead>
<tr>
<th>Section Number</th>
<th>Salient Features</th>
</tr>
</thead>
</table>
| Sections 12, 14 | - License required for distribution;  
                  - Distribution licensee free to take up generation  
                  - Appropriate Commission may grant license to two  
                    or more persons for distribution of electricity  
                    through their own distribution system. |
| Section 42     | - Open access in distribution to be allowed by SERC  
                  in phases;  
                  - State Commission shall, not later than five years,  
                    provide open access to all consumers where the  
                    maximum power consumed exceeds 1 MW;  
                  - In addition to wheeling charges provision for  
                    surcharge to cover current level of cross subsidy  
                  - Surcharge transitional till the cross subsidies are  
                    eliminated. |
| Section 62     | - Retail tariff to be determined by regulatory  
                  commission. |
| Section 55     | - No supply of electricity after two years from the  
                  appointed date except through appropriate  
                  meters. |

### Table 29: Trading

<table>
<thead>
<tr>
<th>Section Number</th>
<th>Salient Features</th>
</tr>
</thead>
</table>
| Section 12     | - Trading recognized as a distinct activity; and  
                  - License required for trading. |
| Section 66     | - Regulatory commission to promote  
                  development of market including trading |
| Sections 79(1)(j) | - Regulatory commission may fix ceiling on  
                  trading margin |

### Table 30: Regulatory commissions

<table>
<thead>
<tr>
<th>Section Number</th>
<th>Salient Features</th>
</tr>
</thead>
</table>
| Sections 38 (d) (2), 39 (d) (2), | - Specify open access at distribution; and  
                  - Specify the surcharge for meeting the current  
                    level of cross subsidy which is to be reduced  
                    gradually |
| Section 42 (2) | - To introduce open access in phases and with  
                  conditions to be specified in a year from the  
                  appointed date |
| Section 82     | - SERC mandatory;  
                  - Constitution of SERC within 6 months from the  
                    appointed date; |
<table>
<thead>
<tr>
<th>Section 83</th>
<th>Section 86</th>
</tr>
</thead>
</table>
| • SERC to have not more than three members; and  
• Chairman and members of the SERC to be appointed by the state government or the recommendations of the selection committee. | The key functions of the SERCs include:  
• Determine the tariff for generation, supply, transmission and wheeling of electricity, wholesale, bulk or retail;  
• If open access has been permitted to a category of consumers, SERC to determine only the wheeling charges and surcharge thereon;  
• Regulate electricity purchase and procurement process of distribution licensees including the price of power procured through agreements for purchase of power;  
• Facilitate intra-state transmission and wheeling of electricity;  
• Issue licenses to persons seeking to act as transmission licensees, distribution licensees and electricity traders with respect to their operations within the state;  
• Promote cogeneration and generation of electricity from renewable sources of energy;  
• Adjudicate upon the disputes between the licensees and generating companies and to refer any dispute for arbitration;  
• Levy fee for the purposes of the Electricity Act, 2003;  
• Specify State Grid Code consistent with the Grid Code;  
• Specify or enforce standards with respect to quality, continuity and reliability of service by licensees;  
• Fix the trading margin in the intra-state trading of electricity, if considered, necessary; and  
• Discharge such other functions as may be assigned to it under the Electricity Act, 2003 |
### Table 31: Tariff issues

<table>
<thead>
<tr>
<th>Section Number</th>
<th>Salient Features</th>
</tr>
</thead>
</table>
| Section 61     | • Consumer tariff to progressively reduce cross subsidy and move towards the actual cost of supply; and  
                 • Regulatory commissions to undertake regulation including determination of multi-year tariff principles |
| Section 62     | • Regulatory commission to determine tariffs for supply of electricity by generating company to distribution licensee;  
                 • Transmission of electricity;  
                 • Wheeling of electricity; and  
                 • Retail sale of electricity.  
                 • Regulatory commission to determine tariff for supply of electricity by generating company on long / medium term contracts;  
                 • No tariff fixation if tariff determined through competitive bidding or where consumers, on being allowed open access enter into agreement with generators / traders; and  
                 • Regulatory commission to consider cost of generation, transmission and distribution separately. |
| Section 65     | • State government to provide subsidy in advance through the budget for specified target groups, if tariff is required to be lower than that determined by regulatory commission |

### Table 32: Dispute resolution

<table>
<thead>
<tr>
<th>Section Number</th>
<th>Salient Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 111</td>
<td>• Appellate tribunal to hear appeals against the orders of CERC / SERC.</td>
</tr>
<tr>
<td>Section 121</td>
<td>• Appellate Tribunal may issue orders to any Appropriate Commission for performance of its statutory functions</td>
</tr>
<tr>
<td>Section 125</td>
<td>• Appeals against the order of the Appellate Tribunal to be placed before the Supreme Court</td>
</tr>
<tr>
<td>Section 143</td>
<td>• Appropriate Commission may appoint any of its members to be an adjudicating officer for holding an inquiry; and</td>
</tr>
</tbody>
</table>
• Adjudicating Officer has the power to summon and enforce the attendance of any person.

Section 158
• In case of any dispute directed under the Electricity Act, 2003 to be determined by arbitration, it would be determined by such persons nominated by the Appropriate Commission; and
• In all other respects, arbitration shall be subject to the Arbitration and Conciliation Act, 1996

Table 33: Other issues

<table>
<thead>
<tr>
<th>ROLE OF CEA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Section Number</strong></td>
</tr>
<tr>
<td>Section 70</td>
</tr>
<tr>
<td>Section 72</td>
</tr>
<tr>
<td>Section 73</td>
</tr>
</tbody>
</table>

Restructuring of SEBs

<table>
<thead>
<tr>
<th>Section Number</th>
<th>Salient Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 131</td>
<td>• Provision for transfer scheme to create one or more companies from SEB</td>
</tr>
<tr>
<td>Section 167</td>
<td>• State government may continue with SEB as State Transmission Utility and generation company and distribution company.</td>
</tr>
</tbody>
</table>

Key Competition - Enabling Provision of Electricity Act 2003

GENERAL

➢ Establishment of independent Electricity Regulatory Commission (ERCs)
➢ Unbundling of State Electricity Boards (SEBs)
➢ Independent system operation by national load dispatch center, regional load dispatch centers and state load dispatch centers.
➢ Adoption of tariff determined by bidding process
The regulator is empowered to issue directives to a licensee / generating company if such an entity abuses its dominant position, which is likely to have an adverse effect on competition.

1) GENERATION

➤ Generation has been de-licensed and captive generation is freely permitted.

➤ Generating and distribution companies are free to engage in trading without procuring a separate license for the activity.

2) TRANSMISSION AND POWER TRADING

➤ Non-discriminatory open access to transmission system

➤ Trading has been recognized as an independent activity

➤ Unbundling of transmission and trading

3) DISTRIBUTION

➤ Multiple distribution license in a supply area

➤ Introduction of phased Open Access in distribution activity

➤ Progressive reduction of cross - subsidies.

➤ Distribution licensees are free to undertake generation and generators are free to undertake distribution⁴.
4.2.1.1 SUMMARY

The nature and the scope of the change has been enlarged in various dimensions that the reforms are radical and comprehensive. They have the vision 2012: The power for all. This needs legislation, which is aimed at breaking the monopoly and leading to free market economy. The key focus is the competition, which is the first step towards breaking the monopoly of the SEB like unbundling and thereafter competition. Nevertheless to command and control the level playing field for healthy competition, appointment of regulator is a must. Therefore existence of GERC was necessary. As a result, GERC existed in November 1998. The GUVNL became residuary company for power trading and issues of implementation of the corporatization among remaining unbundled companies of the SEB. Following legislations are part of the nature and scope of change in the polices:

(1) The Electricity Act 2003
(2) The Electricity Industry (Reorganization and Regulation Act,) Gujarat 2003 No. 24
4.2.2 Objective II: The Implication of policy change on power sector companies

Any change process, has emerging strategic implications on organizations that are part of change. Those strategic implications are to be wisely examined and interpreted. Based on this analysis the organization has to take the steps for change process.

Challenges are to be corresponded by changes.

Challenge (external phenomenon) ↔ change (internal phenomenon)

1) Change management in power sector companies
2) Corporate social responsibilities
3) Environmental management - CDM Carbon credits, ISO 14000 EIA (EPA)
4) EC Act 2001, BEE, Energy Audits etc
5) Emergence of the strategic leadership
6) CIS (Consumer information system)
7) Asset Management companies - Power companies
8) Risk and Reliability Management
9) Safety Management : PS & PSM
10) Human Resources Management - Knowledge management
11) Statutory requirements and BIS
12) Power Trading norms set by GUVNL and Tariff set by GERC Energy
13) IMS for performance improvements and increase in efficiencies
14) Project management and effectiveness.
15) Technology management and IT applications.

From discussion with industry capitals and top notch professionals, very few people had superior quality of awareness about the reforms. Average people even in the middle management had shown their insulation from the aforesaid implications of the policy changes.

This, portrays sluggishness in sharing the vision "Power for all the 2012." This might lead to a shortfall in the target.

Ideally, the researcher's own insights and findings based on the available secondary, primary data and personal interview point out that change management in the organization of the power sector must be in a systematic manner.

This change will imply for newer HR Skills in terms of the energy auditor and energy manager. Also this will imply for newer statutory procedures within the company.
Important forces of change:

Table 34: Forces of Change

<table>
<thead>
<tr>
<th>Force of change</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>Tools, techniques, Instruments, methods, procedures. Knowledge, skills, ambitions, expectations needs</td>
</tr>
<tr>
<td>Work force</td>
<td>Liberalization, Globalization, Privatization breaking the barriers, resource imbalance. Manager, acquisition, entry of new organizations, new products, lowering prices, better services</td>
</tr>
<tr>
<td>Economy</td>
<td>Nuclear families, working couples, late marriages, one child norm. Warring ideologies, new equations, transitory relationships, coalition governments, single super power etc.</td>
</tr>
<tr>
<td>Competitions</td>
<td></td>
</tr>
<tr>
<td>Social Trends</td>
<td></td>
</tr>
<tr>
<td>Political factors</td>
<td></td>
</tr>
</tbody>
</table>

Types of Changes

All changes are not similar in nature. Some changes keep on happening and they are planned. These changes may be identified as:-

- **Evolution**
- **Revolution**
- **Planned Charges**

Evolution: Is the kind of change that comes as a natural process, in small adjustments or shifts in response to emerging problems.

Revolution: Is the kind of change brought about by applying force on others to comply through coercion or suppression to resolve the conflicts.
Planned change (Reforms) :- Takes place when efforts are made to make others feel the need for change, determine the ideas or desired situation and strive to achieve the ideal or desired state through planned action (Reforms and its implementation)

Diverse approaches have been suggested by social and behavioral scientists

a) Exceptional change

b) Incremental change

c) Pendulum change

d) Paradigm change

Change has been explained as a continuum between two extremes as seen in the below figure

**Figure 2 : Approach to change**

```
No Change  Desired  Constant Change
```

"The No Position" indicates the zero condition of inertia - sticking to traditional view, valuing the past conservative thinking that new is definitely bad. Any change or deviation from the past in perceived as a
threat - a threat to beliefs, habits, preferences, norms and prevailing order. When the performance management system is being evolved, constantly sticking to the previous method (where boss does it alone) becomes an example of NO CHANGE position.

The major benefits of this position are stability, less efforts, comfort, less risk but it also brings no growth, boredom, dissatisfaction, conformity and stagnation.

"Constant changes" at the other extreme is a dynamic approach with continuous focus on future. In this approach, new is taken as always good. Any change is seen as positive; resistance is seen as bad and equated with not moving with times and as an opposition to the norms, values and progress. While implementing change with this kind of an approach, not much regard is given to the opinion of the affected people.

The productive (Pragmatic) Approach to change lies between these two extremes and focuses on the existing state (which is happening). Change is seen as inevitable in this approach. The emphasis is on explaining the need for change and making a conscious choice without having a fascination or inertia for the past or a compulsion for rapid change.

Impact and implication of these changes. :-

Policy change - GOI, GOG
Legislative changes - The EA 2003, The EC 2001, The Gujarat (reorganization act) and allied changes.

Regulatory mechanism - CERC and GERC

The implication of these change can be stated broadly

1) Market will be changed
2) Technological changes will take place in the market
3) Organizational change will have to be made to gear-up to the needs.

Market Changes:

In the era of economic liberalization, market forces are destined to dictate the pace and nature of change. Competition is often used for capturing the markets for both goods and services in all spheres by competing industries through joint ventures or subsidiaries. People's expectations have undergone radical change. The companies that satisfy customers in terms of cost, service and value for money forge ahead in competition.

Business may also have to face the changes due to factors such as trade barriers, raw material shortages, change in political regimes, prices shooting up etc.

While such changes are sure to improve quality and bring about customer satisfaction, small business may be affected adversely. It seems that even
political will is succumbing to WTO led forces in developing countries and this could be detrimental to national interest in the long run.

Here we can see the market changes: - (Refer Annexure I).

**Figure 3 : Market Changes**

| Monopoly  →  Oligopoly  →  Perfect Completion |
|-----------|---------------------------|
| (State Electricity Board) | (Yet more time required) |

Market of electricity industry is in transition in Gujarat. These are the Market Changes. Now let us analyze the change and rediscover the value chain for reforms. Liberalization, privatization and globalization is the key trinity in the reforms process

**Punch Line :** When you liberalize your economy the economy becomes market driven and when the economy becomes market driven, market gets technology driven. (Refer Annexure II).

**Reforms: - Advantage**

Liberalize economy → Market Driven Economy → Technology driven market. → Technology management through sustained R&D → Powerful R & D armed by cash rich MNCs → innovations.

Therefore instead of Managing the markets, the MNCs are contributing the market by way of Management of people and Management of Technology.
There is a dire need of strategic leadership.

The implications of these reforms are as following:

(1) **Changes in work culture:** There are basically three phenomena that were observed in Gujarat Power Sector as consequences of these reforms. The first one being the use of 5-S strategy. The 5-S strategy constitutes the following:

- **Sort** - the first step is to make things clean and organized
- **Set In Order** - organize, identify and arrange everything in a work area
- **Shine** - regular cleaning and maintenance
- **Standardize** - make it easy to maintain - simplify and standardize
- **Sustain** - maintaining what has been accomplished

The other ones that have brought or have compelled to change the work culture are E-urja, Jyoti-Gram etc. E-urja is a software that controls and operates the entire power system in Gujarat. While Jyoti-Gram is a programme implemented by the Government of Gujarat that makes 3-phase power available to all the villages in the state.

(2) **The Corporate Social Responsibility:** The researcher's survey says that the concept of CSR has been developing since early 1970s. The FAQ's (Frequently asked question) about CSR are:

- Is CSR a new flavour of the month?
Should the business companies focus on making profits while government regulates companies to be responsive to social and environmental responsibility?

When money and moral clash, what should a company do?

Is this right that there is one and only one social responsibility of business—to use its resources and engage in activities designed to increase its profit?

CSR as opined by our respondents - is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as local community and society at large.

Responsibility in CSR refers to an "obligation"

This leads to following understanding or implied meaning

1) CSR is kind of responsibility of relation or positive responsibility

2) CSR takes those concerned with non share holding interests as the concerned party of obligation

3) CSR is an integration of legal and moral obligation of the company

4) CSR is an amendment and complement to the conventional principle of maximized profits for share holders.

The power companies have to consider CSR because it has secured place in the Companies Act 2000.
Environment Management Implication: While interviewing several top policymakers and thinkers in power sector and having done literature review published by BEE, environmental issues that have popped up for all industries are mainly:

- Ozone layer depletion
- Global Warming
- Loss of biodiversity

Ozone layer depletion: This happens because of CFCs (used in refrigerator and air conditioners) and other ozone depleting substances (ODS) are emitting in atmosphere.

Global Warming: Due to GHG gases, some GHSs occur naturally in atmosphere while others result from human activities.

Naturally occurring GHS include water vapour, carbon dioxide, methane, nitrous oxide and ozone.

National as well as Gujarat Power Companies too are bound to initiate the action against climatic change problems and response for environment management.

Act. 12 of Kyoto protocol defines the clean development mechanism whose purpose is to contribute to sustainable development in developing countries and help Annexure I countries under Kyoto protocol to meet their target.
Indian Initiatives on implementation of CDM has been followed by GIPCL in Gujarat.

The Prototype Carbon Fund (PCF): Recognizing that global warming will have the most impact on its borrowing client countries, PCF is interested at the projects that produces high quality GHG emission reduction that could be registered with UNFCC for the purpose of Kyoto protocol Indian Companies vis-a-vis state power companies are implied to work as the environment management.

This can be extended to Environment impact assessment as suggested in correlation with the Environment protection Act 1986 which is the umbrella act for the Air Act, the Water act, The Land act (The degradation of soil etc.)

Also ISO 14001 available for environmental quality is playing its role in modern management in Gujarat Power Sector Companies.

(4) The Energy Conservation Machinery which was set up by GOI having policy frame work of the Energy conservation Act 2001. This was due to high energy saving potential and its benefits with a view to bridge the gap between demand and supply, reducing environmental emission through energy saving.

The provision of the Act allowed to establish the BEE i.e. Bureau of Energy Efficiency on 1st March 2002 by merging erstwhile energy
management centre of Ministry of power. The bureau is responsible for implementation of policy programmes and co-ordination of implementation of energy conservation activities.

The EC Act 2001 has been implemented by BEE in Gujarat through GEDA and BPC. The provisions are as follows:-

- Standard and labeling
- Ascertaining designated consumers
- Certification of Energy Managers and Accreditation of Energy auditing firm.
- Energy conservation building codes
- Central Energy conservation funds
- Enforcement through self regulation
- Penalties and Adjudication

The power sector companies will have to respond to the energy efficiency policies as per the aforesaid directives and lines.

The generation of 1 MW power required nearly Rs. 100 Crores investment and conversion of thermal energy into over time electrical energy.

There are following implications:-

1) Climatic charge problem and response of the Nation, States organization in Industrial Meter including power sector
   a) The UNFCC (United National Framework Convention on climatic change)
b) The KYOTO protocol

i) Emissions Reduction

ii) Responsibilities of the developing countries

2) The COP (Conference of parties) is the supreme body of the climatic change convention. The vast majority of the world's countries are members (185 as of July 2001)

Implication for this

(1) Exchange of information

(2) Support for developing countries

Kyoto protocol gives Annexure I countries the option to fulfill a part of their commitment through three **Flexible mechanisms**. Through this mechanism, a country can fulfill a part of their emission reduction in another country or buy emission allowance from another country. There are flexible mechanisms.

(i) Emission Trading

(ii) Joint implementation

(iii) Clean development mechanism

Generation is a costlier affair.
The conservation of energy and achieving energy efficiency is the ‘Kaizen’ for power industry. This needs continuous improvement for achieving highest energy efficiency and ‘Six sigma’ for pure and clean power.

(5) Strategic Leadership

The power sector, when in monopoly need not be bothered about the management of the various organization. The top leadership of the SEBs were mainly the bureaucrats or appointees by the ruling parties. The dire need has been emerged to replace top leadership by professional strategic managers who are having capacity to lead the power sector companies by transforming from traditional entity to modern business entity.

Our examination and probe into prospective strategic leaders has yielded several remarkable findings. The respondents had picked appropriate qualities of the strategies, which may decide what kind of leadership is required at the top of the power sector companies in Gujarat.

Also we studied complex issues and challenges in the power sector and power sector companies whenever possible. This has given the precise requirement of strategic leadership of the power sector companies and policy makers of Gujarat Power sector.
(6) Consumer Information System :-
The inquisitiveness to know about consumer segment led the researcher to H.T. Consumers :-
The consumers are given full information in billing system and the consequent communications.

(7) Asset Management Companies :-
The study about power sector organization in Gujarat has given unlimited dimension to view what is expected of the power industry. This industry has transformed from the SEB to separate corporate entities, so were having Traditional Structures. But modern reformed organization maintain new concept of plant management that is called “Asset Management”

Today’s plant managers (increasingly referred to as an “Asset Manager” to reflect new responsibilities) must worry about things that were once the domain of accountants, regulatory specialists, and chief financial officers. One of these newly found responsibilities is the Management of complex business contracts which can include:

- Performance guarantees
- Environmental restriction
- Service Agreements
- Purchasing obligation
Tools for asset Management in Revenue and cost Management:

- Budget Planning
- Production Planning
- Production costing
- Production Accounting
- Revenue Management / invoicing
- Forecasting production scheme
- Predictive heat rate models
- Real-time data integrity Management
- Single and multiple plant support.

Power professionals today must know more than just how to get the plant up and running, or how to get things fixed when they break down. New asset management responsibilities include understanding and administering the subtleties of the contract language.

The power companies in Gujarat must observe this method.

(8) Risk & Reliability Management:

In any process of industry there is “Risk Assessment” method for finding the possible threats of failure. “Reliability engineering / management” is complementary to “Risk analysis /management” which is helpful to avoid breakdowns or failures in the industry.
(9) Safety Management :-


The Industrial Safety especially in power companies is meant for plant/substation/generation station/transmission tower lines / electrical equipments etc. This includes personal safety and plant safety as well the modern management has included process safety.

Safety is an Industrial discipline - whereby lot of policing is required to avert accidents - personal and process.

Safety emerged for modern power sector (1) Plant and Personnel (2) Process

A proper communication system is to be developed for proper work permit system and procedure for energizing and de-energizing the equipments. In the operational management of the electrical equipments there is a risk hazards of electricity. The isolation system through PLC based operation must be mechanized.
On the spot, first aid is to be provided in case of any accident. Electrical fire in substation is to be extinguished by CO₂ type fire extinguishers.

The zonal safety can be harnessed by Area classification. These are the stringent implications for power sector companies post-reforms.

We had insider view of the safety departments of various companies by arranging personal visits.

(10) Human Resources Management - Knowledge management

The power sector is growing. This can be read from the statistics of their demand and sale of power equipment companies. There is exponential growth in the sale of power/electrical equipment companies. The new legislations have implications on power sector companies for intense recruitment of power/electrical engineering technologists, technicians, commercial experts in tariffs etc and quality auditors, energy auditors, for which the power sector will have to gear up.

Advance strategies of Multinational companies suggest that companies that are reformed must do proper strategic knowledge management. They must use the knowledge management as an effective tool in the functioning of the companies.
Statutory Requirements and Bureau of Indian Standards:-
The power sector companies will find the following most probable applications of the Act/Law/Rule as statutory requirement. The Bureau of Indian Standards guidelines are the reference guidelines for standards (The power sector company will be using mostly the following registers.)

Register of Legislation for power companies from Generation, Transmission, Distribution:-

1) The Environment Protection Act, 1986
2) The Electricity Act, 2003
3) The Energy Conservation Act, 2001
4) The Public Liability Insurance Act, 1981
5) The Batteries (Management and Handling) Rules, 2001
6) Ozone Depleting substance (Regulation and Control) Rule 2000
7) The Electricity Rule, 1956
8) The Factories Act
9) The Factories Rule (Gujarat), 1987
10) Indian Boilers Act, 1923
11) The Electricity Duty on Generation, Act 1956, Bombay
12) Electricity supply undertakings (Acquisition) Act, Gujarat 1969
13) Procedure for establishing/Expansion./Modernization of an industrial unit
14) The IT Act 2000
15) The Companies Act 2000 (For corporate social responsibility and other provisions)
16) Payment of Wages Act, 1936
17) Workmen Compensation Act 1965
18) Charter of environment protection
19) Obligatory Rules
   ➢ Earthpit Resistance checking Rule 1956, 67, 5(b)
   ➢ Transpower Oil Testing Rule 1956, 9 & 46 (Annexure IX A, Form I, Item 29)
   ➢ Electrical Handtools & PPEs (Personal Protective Equipments) Rules 1956, 36 (I)
   ➢ Authorized Persons List Rule 1956, 3 (2)
20) The Electricity (Special Powers) Act, Bombay 1946 No. 20
21) The Electricity Industry (Reorganization and Regulation) Act, Gujarat 2003 No. 24

Bureau of Indian Standards are having the supremacy on any of the guidelines sought by the power companies for standardization.

(12) Power Trading norms implemented by GUVNL and tariff decided by GERC:-

The pivotal roles are played by both these organization in Gujarat’s power economy. They are power houses of the Brettonwood ie. Vadodara – Sardar Patel Vidyut Bhavan and Udyog Bhavan, Gandhinagar.
All power sector companies will have to interact with GERC for regulations and sale of power or purchase of power with GUVNL.

(13) Integrated Management System:-

When we talk of Mckinsey's 7S Framework, which is given "In Search of Excellence" by Tom Peters, the system to be designed for handling and minimizing complex problems in the modern power sector companies is IMS.

The Integrated Management System is the solution that has emerged from variety of complicated issues in company governance.

When we made a rigorous search in the global companies they had the best integrated approaches for most effective systems.

IMS for Power Companies, which is useful in performance improvements and increase in energy efficiencies

The need to develop the Integrated Management System which will take care of qualitative output of every kind that will deliver pure management benefits towards change management, profit generation through maintaining equilibrium among the stake holders, resources and their interests in power. For this, we might require to integrate various system within the companies in power sector.
It is implied that the evolved system for power sector organization for Gujarat must meet with the requirements of being well equipped against strategic challenge. In the increased competition in the world market, top class components have adopted integrated approvals for solving their problems. Stake holders of IMS of a power sector company are:

- Customers
- Management
- Employees

**Figure 4: Business Environmental friends and neighbors**
The IMS is the productivity through conveyance of (1) Quality (2) Environment (3) Safety

In various power systems, there is an electricity. The destination between a beneficial and non-beneficial system is the ability of the researcher and designer to identify opportunities to simplify the system. Thus simplification of the systems increases the productivity of organization by reduction in time, manpower and expenses.

Integrated management system provides a structured approach for continued improvement in every operational process of the organization from purchase to production; from service to security.

![Figure 5: Change Management with IMS](image)

- Continuous Improvement
- Simplification
- Structure
- Divergence
Integrated Management System

The integrated management system, is the amalgamation of all the above systems into a logical structure.

This integration is based on the process approach of ISO 9001: 2000 All respondents said that their organization needs the integration in system for responding to the change.


Companies like Reliance Industries Limited follow this arrangement of IMS for effective functioning.

14) Project Management

The new projects on establishing generation plants, transmission and distribution systems are to be in congruence with the vision of the Government policy. They need the best attention in managing the projects. Any project in the power sector is to be implemented within the constraints of time, quality, cost and environment.
Some planning tools in use are Bar Chart, Gantt chart, PERT Network, S-Curve.

The new project achievements are to be managed and optimized within the given constraints. The contracts are to be given based on

- Turnkey contract or
- Unit Rate contract

The preparation of “Detailed Project Report” (DPR) is must for effective management.

15) Technology Management :

Some Power sector companies have identified the need for technological changes in the present system of operation & management. But due to financial resource scarcity they are unable to undertake Renovation and Modernization programme (R & M program).

The new technology can give efficient outcome and higher productivity. The information technology will be a boon in this regard.
4.2.2.1 SUMMARY

Gujarat power sector companies will have to realize the change in the policy legislation and regulation and must develop the capacity to anticipate the change both internally as well as externally. They need to identify the implications of these changes. This will help them to prepare a roadmap for future actions.
4.2.3 Objective III: Exploring problems and issues faced by Power Sector Companies in the Light of Policy Changes:

(I) Issues in Generation:

(a) Asset Optimization Issues:

(1) Benchmarking

(2) Minimization of operating cost

(3) Improving heat rates

(4) Inter relationships between market rates and power plant operations

(5) Improving plant ability to cycle in response to prices

(6) Outage management

(7) Optimal Maintenance practices

(8) Risk Management

(9) Design, troubleshooting and predictive maintenance for steam, gas turbines.

(10) Fuel strategies

(11) Plant Life Extension

(12) EPC (Engineering/Procurement/construction) contracts - availability for major retrofits

(13) Plant retrofits/refurbishments/re powering

(14) Strategies to improve capital productivity
(b) Environmental Compliance Issues:-

(1) Solutions to environmental issues e.g. mercury emission
(2) Multi pollutants control technology $SO_2$ /$NO_2$ allowance prices - forecasts
(3) Plant cooling system and water chemistry
(4) Coal gasification
(5) Emission reduction technology retrofits
(6) Emerging environmental legislative/ regulating requirements

(c) Other Issues:-

1) Power plant employees health and safety
2) Power plant security
3) Market trends and strategy
4) Work culture
5) New generation technologies including storage
6) Supply chain management
7) Combustion by product recovery utilization
8) IT applications
9) Financing for new projects

(II) Issues in Transmission :- SLDC - ALDC

1) Jyotigram - 24 x 7 Load is increasing but HR crunch/Manpower is felt.
2) **Outsourcing** - Substation - Operation and Maintenance (O & M)
   to be given to third party
3) **E-urja** - Old people don’t have knowledge of computer
4) Availability of lines by maintaining and permission of isolation
   by yellow ticket
5) Line loss is to be allowed by GERC to GETCO not more than
   4.27%
6) Capacitor banks to be maintained at load for averting poor
   voltage
7) Power factor improvements
8) Insulator string is heavy but China made is replaced
9) Minimum Oil Circuit Breaker (MOCB) to SF6 Circuit breaker -
   changes
10) Scheduling - Availability of Power (done by SLDC)
11) Poor T & D loss (AT &C) have been major issue
12) Technological Issues
   a) Choice of transmission for bulk power evacuation and
      transfer -AC or DC
   b) Limitation of AC transmission - SIL (Surge impedance
      loading).
   c) Conductor - Right of way issue
   d) Insulator - Pollution effect
   e) Reactive Power Management - Losses
   f) Maintenance - Preventive and predictive
g) Renovation and Modernization - Why it is necessary

h) Concept of life cycle cost (LCC)

(III) Issues in Distribution

1) Restructuring the distribution sector
2) Financial allocation to DISCOM
3) Consolidating business portfolio
4) Corporate social responsibility
5) Change in mission statements
6) APDRP implementation/ DRUM project
7) Legal system revamping
8) Ethical importance
9) Knowledge Management
10) Revenue generation
11) Reduction of T & D losses
12) Theft Prevention
13) Expanding IPT consumer base
14) Tariff regulation
15) ABT metering

(IV) Tariff Rationalization:

This is dealt by GERC, which issues tariff orders. All the regulatory issues are handled by the GERC.
The issues related to new connection HT/LT are dealt by the commissioner of electricity of the Gujarat State as per the guidelines by GERC and the Indian Electricity Rules.

Multi year Tariff is yet another issue to be handled carefully by GERC.

(V) Power Trading

The sale and the purchase of power is done by GUVNL as an apex organization. The national role of Power Trading Corporation is performed by GUVNL in Gujarat state. The Power Purchase Agreement documents are to be signed with GUVNL for short term sale of power by CPPs of private companies.

15 power companies have evinced interest in supplying power to GUVNL through competitive bidding. These companies include names like Reliance Energy, Essar power, Torrent Power, Welspun, Thane based Emco, Dharampal Satyapal, KSK energy, Tata Power, Visa Power, AES(India) and Sanghi Industries.

Almost all top power companies have purchased Request for Qualification (RFQ).

In the initial stage, GUVNL had invited proposals from power generators, traders and promoters to procure 2000 MW power on long term basis.
The second round of bids for power purchase through competition bidding got completed.

First round fetched 3200 MW power @ Rs. 2.25/- to Rs. 2.40/- per unit and had 25 companies and consortia.

GUVNL did not specify any specific fuel or technology for power generation. GUVNL’s intention is to complete second round of bidding for 2000 MW on a long term basis¹².

(VI) Financing the Power Project:-

Yet the curbs on the external commercial borrowings for the power sector are not eased by the Government of India. Due to sectoral caps and other limitations, the domestic banks alone cannot meet the debt requirement for planned capacity growth.

Although the financing scene has improved with strong flows from banks and capital markets, still the needs of the industry are quite large.

Similarly, energy saving funds, environment management funds and technology upgradation funds are important factors for financing the power projects.
4.2.3.1 SUMMARY

There are transitory and transformatory phases of the power sector companies when the policies are changed. The issues and challenges would be at national, state and organizational level. They would cover levels like policy, legislation, corporatization and regulation etc. They are to be further expanded up to prefect competition level.

The major issue is open access that is not fully satisfied. The GERC and GUVNL must take the steps accordingly. The second aim was to abolish single buyer model (that is GUVNL) is not yet realized. Hence to handle such issues at macro and micro level we require the strategic leadership at the apex. This was reflected in the personal interviews and questionnaire fielded to the respondent.
Objective IV: Responses of power sector companies to gear up to the changing needs:

Most of the unbundled companies have framed their Strategic Management Policy for which they evolved their Vision and Mission Statement

1) GETCO

It was set up in May 1999 and is registered under Companies Act 1956

Vision: To build, operate and maintain an efficient power transmission system

Mission: To achieve globalization in transmitting reliable and quality power

Core values: Participative work culture excellence

Being ethically and socially response

ARR - Aggregate Revenue requirement

1a) SLDC

SLDC is at 132 KV Gotri substation at Vadodara city.

It is the nerve center for power grid of entire state of Gujarat, SLDC is responsible for healthy, efficient and economic operation of power
system. The objective of SLDC can be defined as "Managing quality power most economically". As a part of various functions, SLDC has to remain in Contact with other utilities like GUVNL Trading Co.), GSECL (Genco), DISCOMs - DGVCL, PGVCL, MGVCL, UGVCL AEC, SEC, IPPs, CPPs, Non conventional generating units has to be conversant with the matters pertaining to concerned utility for best result.

**Supervisory control and data Acquisition system** referred as SCADA is available at SLDC to get online data of power systems, system analog data such as MW, MVAR, KV and Hz and digital data such as breaker isolator, ON or OFF status is available for all power stations, all 400 KV substation and strategic 220 KV substations. The various functions of SLDC are :-

- Maintain grid security
- Quick restoration of grid to normalcy in case of disturbance
- Maintaining quality of power in real time both in terms of frequency and voltage.
- Scheduling of distribution as generation in most economic way
- Demand forecast
- Generation outage planning
- Network outage planning
- Contingency analysis
- Generation scheduling on merit order
- Power indent from ISGS station on merit order
- Power purchase from IPP on merit order
➢ Power purchase from CPP on merit order
➢ Exchange of power with neighboring systems.
➢ Regulation of unscheduled export import with reference to frequency in the light of ABT.
➢ Maintain system discipline in line with IEGC (Indian Electricity Grid Code)
➢ Demand side management
➢ Blackstart after black out (cascading)
➢ Data logging and reports
➢ Processing short term open access application
➢ Preparing energy accounting
➢ Maintaining UI Pool accounting
➢ Selling of surplus power at competitive price.

1 aa ) ALDC (Area Load Dispatch Centre)

3 Nos. of ALDC are setup at Gandhinagar, Jambuva and Jetpur under unified Load Dispatch centre scheme of western region, the function of ALDCs are:

➢ Effective control and supervision of Intra-state Transmission System
➢ Monitoring DISCOM drawls
➢ Functional requirement of Discom control centre.
2) MGVCL

Vision :- Consumer Satisfaction through service excellence

Mission :- To provide reliable and quality power at competitive cost to reach global standards in reducing distribution losses.

3) UGVCL

Vision :- To be world class electricity utility, striving for social and economic development of our region.

Mission :- We meet the expectation of our customers and stakeholders by:

➢ Providing a sustainable, affordable safe and reliable electricity supply.
➢ Providing prompt and efficient customer services.
➢ Developing and providing incentives our employees.
➢ Being the preferred equal opportunity employer.
➢ Undertaking our business in an environmentally acceptable manner.

Values :- Respect Ethical business conduct

Honesty Pride and ownership

Loyalty Service excellence

Superior performance

Team culture
4) PGVCL

AIM

The supply of quality power to our valued customer

1) Reduction of AT and C Losses
2) Better services to consumers in all respect
3) Minimize the grievances of our valued customers

5) GETRI

Mission :- Create a world class training institute which leads the way to change

Vision :- 100% Training to all, Continuous skill upgradation, Patent Research work.

6) GSECL

Vision :- To become one of the most efficient power generating companies globally.

Mission :- To generate power by adopting global best practices through professional excellence, transparency, value addition, highest level of productivity, nation building, safety, self discipline.

Core Values : 1) Customer satisfaction 2) Pride of belongingness
7) GIPCL

It was incorporated in 1985 as a public limited company under the auspices of Government of Gujarat. The company is engaged in business of generation of the electrical power. With the total capacity of 555 MW at Vadodara and Mangrol, the company has a vision to “Transform itself into a national level power sector enterprise”

**Distribution** :- Distribution companies have started replacing ABT Meter in place of old traditional analog meters. Automatic Remote metering reading system is being used at many connections.

- This system has many advantages with latest technology application such as zero meter reading error and savings in manpower
- The instant information and real time data helps to detect any type of tampering and also restrict the unauthorized operation
- One way communication helps monitoring anytime consumption and provides appropriates control signal to the meters.

**HVDS**

- The system uses HT conductor and single phase earthing type and three phase transformers of the capacity of 10 KVA, 16 KVA, 25 KVA and 63 KVA.
The implementation of the same is being planned out for various pockets to restrict the power theft and simultaneously reduce the T & D losses.

Various limitations and draw backs are sorted out and the work to eliminate such draw backs is being done to reap the maximum advantage of the system.

APFC

The Automatic Power Factor Control System is used to improve the lagging power factor automatically as per the requirement of the system.

This helps reduction of current in the system which in turn reduces the technical loss.

HAND HELD INSTRUMENTS

Hand held instruments ensures the correct and exact meter reading as it eliminates the human intervention.

Unfair practice of lower side billing thereby awarding lower slab tariff is eliminated with the use of these instruments.

LOAD MANAGEMENT :-

Each distribution company has separate load dispatch centre which is responsible for the daily and half hourly load forecast and implementing load control measures instantaneously.
These load dispatch centers are called **Area Load Dispatch Centers (ALDC)** of each distribution company respectively, which work under the supervision and control of the **State Load Dispatch Center (SLDC)**.

Load management and load control is the most important function to cater to the power supply as per the requirement of the consumers thereby balancing and taking care of economy factors of the distribution company also.

All ALDCs are operative in all distribution companies but they still are not operative fully independent to deal the power purchase from any supplier operative in the market. They still have to depend on the SLDC for power purchase. Major power restriction instructions have to be obeyed by all ALDCs as per the directives of SLDC.

**GEOGRAPHIC INFORMATION SYSTEM (GIS):**

- Geographic Information System based on the Global positioning survey (GPS) is being implemented for the whole Distribution Networks under various Distribution companies.
- The GIS work for Baroda City is already completed and the work for other network is in progress
- GIS helps to determine the information of each pole, each connection is available the click which can be analyzed for available voltage level and load pattern in the circuit.
• The alternative suggestions are available from the software to improve upon the system parameters, thereby saving energy.

• GIS software usually uses the ARCINFO software to display the Rafter images of the network, which is an impaired image of electric network, based on the latitudes and longitudes determined by the GPS at each pole of the network.

• These Lat-longs are superimposed on the digital/satellite image of the geographic area.

• The vector diagrams of the network are also available for analysis and whole network along with flow diagrams can be reviewed and studied on the computer screen itself.

POLE MOUNTED METERING SYSTEM:

To avoid the tampering of meter and thereby prevent the theft of electricity, Circle has decided to go for pole mounted metering system at some identified places.

This system has the metering unit installed on the electric pole from where service line is laid 10x4 Nos. (40 Meters), etc., of such pole mounted meters are received and installed as a series metering system to monitor the consumption recorded in the meter.
STRATEGIC MOVES AND ANALYSIS TO SUPPRESS POWER THEFT

- Surveillance of doubtful connection is carried out to debug the theft cases.
- Static meters are being provided to all industrial connection.
- Distribution boxes are locked on the transformers having industrial connections.
- Benchmarks are set for the feeder amperes and are being monitored very closely

Generation :-GENCOs includes GSECL, IPP STATE, IPP PRIVATE

As a part of GSECL’s expansion plans :-

1) EPC was awarded to Alstom in March 2007 for **Utran** - 370 MW
   EPC was awarded to BHEL in April 2007 for **Sikka** - 500 MW (Jamnagar)
   For this, BHEL project has imported coal based supply of fuel, which has been arranged on a contract of 25 years.

2) It is likely that UKAI 500 MW EPC Contract with M/s. BHEL is in pipeline. Dhuvran - 370 MW gas based project is in pipe line by L & T

3) Expansion at 800 MW Wanakbori Power Plant which is coal based
   Expansion of 1000 MW Sinor Power Plant coal based
4) It is presumed that Rs. 8000 Crores required for increase in the generation capacity out of which Rs. 6000 Crore are assured by Power Finance Corporation and Asian Development Bank.

5) GIPCL and State IPP have implemented a project on CDM and expanded its production based at Nani Naroli by the lignite power plant.

Also GIPCL is in the pact with neighboring industries for common inventory pool for CPP machines.

6) Essar Power Ltd. has ambitious expansion plans. They had chalked out the plan for power production of 1500MW at Hazira but it did not work out smoothly because of the non-availability of gas. But they have expansion of power production at Vadinar Essar Refineries with a capacity of 500 MW.

7) Torrent Power Ltd and Gujarat Paguthan Energy Company have chalked out their expansion plans.

This is the result of the liberal policy of the Gujarat Government for power reforms. All the power sector companies have geared up for the change.

GPEC has nicely orchestrated contracting system based on the MNC patterns with merely 150 manpower generating 555 MW. O & M contracting is very effective here.
GPEC owns and operates a 655 MW gas fired combined cycle power station, which uses modern gas turbines designed to burn both gas and Naptha.

From its inception, the power station set exponential reliability and safety standards and has maintained an excellent safety record with **ZERO** accident for employees for more than seven years. This performance is the best, among the organizations of Indian Power Sector.

GPEC initiated the process of implementing the **Five Star Safety Health** and Environment (SHE) Management system developed by **National Occupational Safety Association** (NOSA) of South Africa.

Transmission Companies implemented expansion programme and increasing line availability, reducing T & D losses preventing low voltage losses, power factor improvements, ABT metering at Sub stations for revenue generation. The CKM can be increased by additional finance. Unbundled companies from GSEB had E-urja and Jyoti gram Projects. Also for moulding the work culture they had introduced 5 -S system for change.

Power companies understood the consumer viewpoint of the business i.e. safe, reliable and economical power. Therefore GETCO adopted strategies for theft prevention.
Companies like Torrent and Adani are trying to change their face as consumer friendly companies. They have started consumer friendly programmes for consumer awareness. The CERS - the Consumer Research society also has played a pivotal role in bringing them together i.e. the company and the consumer. The DISCOMs - State owned, hold regular contacts with their consumers.

Adani and KPC are having trading license for electricity. The Sardar Patel Vidhyut Bhavan is the main power centre for the electricity industry of Gujarat.

The Government of Gujarat has given the permission to establish UMPP and SEZ ie. Ultra Mega Power Project and Special Economic Zones for power.

**INTRODUCTION TO AVAILABILITY BASED TARIFF (ABT) METERING:**

The power sector companies have adopted ABT metering application which deals with tariff structure for bulk power, performance based tariff and supply based tariff. This is a system of rewards and penalties seeking to enforce day ahead pre-committed schedule (one and a half hours in advance). This also promotes responsibility and accountability in power generation, paradigm shift from maximum power to maximum reliability. This is a path to deregulated market.
4.2.4.1 SUMMARY

The unbundled companies have evolved/changed their vision, mission statement and line of action for facing the oligopolies and nation in the market. This has started making the habits of functioning as per the regulations of GERC and forwarding their appeals to GERC for any grievance. The unbundled companies implemented Jyoti-gram, E-urja, ABT metering programs for being successful in change management.

Torrent power, Essar Power are customer friendly companies. They attempted to deliver more services by cost effectiveness and the demand side management. They tried to build more generation capacities and have long term agreements with their fuel suppliers. GPEC has adopted efficient contract system for operation and outsourcing of the services.

GIPCL is trying to build the generation capacity and inventory control. It has also undertaken CDM Project implementation.
4.2.5 Objective V: Identifying Strategic Issues And Future Scenario of Power Sector:

As studied in the beginning, with the change of economic policies in 1991, in India, it extended its wings to infrastructure to power - electrical power (the prime energy resources). The classification of energy has been done with a view to give the importance to energy management.

Figure 6: Major Primary and Secondary Sources

Electricity is a secondary energy. The Conversion of Energy is done from coal, hydro, nuclear, natural gas, petroleum etc, which are called the main sources in power generation system.
When we think about strategic issues of the energy sector and power sector we must think of coal, oil, natural gas, electricity etc.

India had a peak demand shortage of around 14% and an energy deficit of 8.4%. Keeping this in view and to maintain a GDP (Gross Domestic product) growth of 8.1 to 10% the government of India prudently set a target of 215,804 MW power generation capacity by March 2012. The Vision is “Power for all” This is a strategic issue for Power Sector.

For this, the reforms are in place. The policy change has to be followed by legislation and GERC for regulatory governance, slowly it must move towards deregulation in democratic ways. There has to be an end of monopoly as it happened in Gujarat. From one SEB of monopoly policies it has changed the power sector into oligopoly by eleven corporate entities. This will make further progress too.

From 1947 to 1991, for almost 45 years, power sector was in the central monopoly services. From 2003 onwards, it started positive progress with alignments of global directions. This was consolidated and supported by various legislations. Before it goes to free market economy in power sector (Laissez faire). There has to be regulation on competition for providing level playing field to all the players in the market.

So the existence of GERC came into being as per the setup of Central
Electricity Regulatory Commission (CERC), which regulates central utilities. State level bodies have also been set up to set tariffs and promote competition. Private investments in power generation were allowed.

The transmission companies would be operated by special grid code and grid discipline.

The Distribution sector is supported by APDRP, DRUM, RGGRY, Jyoti gram, E-urja etc. at state level. Reduction in subsidy and rationalization of tariff was the strategic agenda.

Over and above, the strength of the power sector can be measured by its resources, which turned to be strategic issues:

1) Power Management
   a) Generation The EA 2003
   b) Transmission The Gujarat Industry Reorganization and Regulation Act 2003
   c) Distribution

2) Energy Management - The EC Act 2001
   a) The Bureau of Energy Efficiency
   b) GEDA
c) Energy Audit
d) Standards & Labeling

3) Environment Management

The CDM, Carbon Credit business evolutionary trends in pollution control

4) Corporate Restructuring of unbundled companies from SEBs

5) Technology Management in Generation, Transmission and Distribution

6) Envisaging new roles for the new stakeholders in the power sector

7) Financing for new projects by strong backup

8) Applying new management tools for the power sector in oligopoly

9) IT application in power sector

10) Consumer friendliness for better results by distribution companies

11) Human Resource Management is very much important. When the GSEB unbundled, sudden change in the human behaviors was not possible. Therefore redeployment of any employee was possible only after re-training.

For speedy implementation of reforms we need dynamic manpower to fulfill the criteria of:

➢ People
Just like Karl Marx’s said, “For an industry - you need land, labour and capital”.

For power industry we need Land, that is costly now, Labour i.e. skilled labour or perhaps desired quality - knowledge worker and capital / funding for new power projects.

The future of the Gujarat Power Sector is difficult to be predicted as it is dependent on implementation of grass root policies at center. But we can have the hopes to have been seeing the following entities / stake holders within it.

1) Corporatized Generation, Transmission, Distribution companies that have been formed from unbundled SEB.

2) The ESCO Company: - Energy service company

The ESCO Company identifies and evaluates energy saving opportunities in industrial units, commercial complexes, hospitals, municipalities and utilities among others, by using energy audit tools and by recommending
the package of improvements that can pay for itself through resultant savings.

The ESCO will generate the savings that would meet or exceed annual payments to cover all project costs, usually over a period of 7 to 10 years. If savings do not materialize then ESCO will pay the difference.

The ESCO guarantees to generate energy efficiency and cost savings through an energy savings account (ESA). The customer commits to a payment schedule.

Figure 7: ESCO Model

The major aim of ESCO is to provide performance based financing.

To strength this, barriers model, Untitled Nation environment progress and the World Bank, with funding from UN Foundation, have been implementing a project since 2002, for developing financial
intermediation mechanism for energy efficiency investments in India, China and Brazil known as Three Country Energy Efficiency Project (3 CEE)

Power companies will take the advantage from ESCOs in future.

Table 35: Energy Efficiency Benefits

<table>
<thead>
<tr>
<th>INDUSTRY</th>
<th>NATION</th>
<th>GLOBE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced Energy Bills</td>
<td>Reduced energy imports</td>
<td>Reduced GHG and other emissions</td>
</tr>
<tr>
<td>Increased Competitiveness</td>
<td>A voided costs can be used for poverty reduction</td>
<td>Maintains a sustainable environment</td>
</tr>
<tr>
<td>Increased Productivity</td>
<td>Conservation of limited resources</td>
<td></td>
</tr>
<tr>
<td>Improved quality</td>
<td>Improved energy security</td>
<td></td>
</tr>
<tr>
<td>Increased Profiles</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Benefits of Energy conservation for various players are given in the above figure
Energy Strategy for the Future

The energy strategy for the future could be classified into immediate, medium-term and long term strategy. The various components of these strategic are listed below:

Immediate - term strategy :
Rationalizing the tariff structure of various energy products, Optimum utilization of existing assets, Efficiency in production systems and reduction in distribution losses, including those in traditional energy sources, Promoting R & D transfer and use of technologies and practices for environmentally sound energy systems, including new and renewable energy sources.

Medium - term Strategy :

- Demand management through greater conservation of energy, optimum fuel mix, structural changes in the economy an appropriate model mix in the transport sector. I.e. greater dependence on rail than on road for the movement of goods and passengers and a shift away from private modes to public modes for passenger transport; changes in design of different products to reduce the material intensity of those products, recycling, etc.
- There is a need to shift to less energy - intensity of transport. This would include measures to improve the transport infrastructure viz. Roads, better design of vehicles, use of compressed natural gas
(CNG) and synthetic fuel, etc. Similarly better urban planning would also reduce the demand for energy use in the transport sector.

- There is a need to move away from non-renewable to renewable energy sources viz. solar, wind, biomass energy etc.

**Long-term strategy :-**

- Efficient generation of energy resources
  - Efficient production of coal, oil, natural gas
  - Reduction of natural gas flaring

- Improving energy infrastructure
  - Building new refineries
  - Creation of urban gas transmission and distribution network
  - Maximum efficiency of rail transport of coal production.
  - Building new coal, gas fired power stations.

- Enhancing Energy efficiency
  - Improving energy efficiency in accordance with national, socio-economic, and environment priorities
  - Promoting energy efficiency and emission standards
  - Labeling programmes for products and adoption of energy efficient technologies in large industries
• Deregulation and privatization of energy sector
  • Reducing cross subsidies on oil products and electricity tariffs.
  • Decontrolling coal prices and making natural gas prices competitive
  • Privatization of oil, coal and power sector for improved efficiency

• Investment legislation to attract foreign investment
  • Streamlining approval process for attracting private sector participation in power generation, transmission and distribution

**Environment Management Companies**

Due to CSR, safety, quality and environment assets integration with business management Integration systems (IMS). In the future we may find that the specialist companies will have space for business in the power sector. This has become possible because of the change in the policies.

**Asset Management Companies**

The old plant management was only concerned with production rather than productivity which has now been replaced by asset management of companies. The management will respect the value chain and the process of the power business
HR Management Companies

Since the Gujarat Power sector is having the total manpower resource in the vicinity of 55000 to 58000 against the demand of the state 8,000 MW.

Most of the human resource dominates traditional skills because they are having SEB culture. They need a strategic leader to transform and change them for faster development in the power sector. HR policies can be newly framed as per the demands of the power industry.

Training institutions like GETRI, ERDA, IPMG, IGNOU, GEDA, NPC, POMC are at the center stage for future reshaping of the skills in the power sector.

There is an exponential growth in power/electrical equipment manufacturing as the demand from GTD ie. Generation, Transmission, Distribution is increasing. Recruitment of more manpower will be the future trend. This can have linkages with ITI, Polytechnics, Engineering faculties and power management Institutes.

Emergence of Meta organizations

The convergence of networks and telecommunications allows us to propagate plant data and information to whatever they have needed - Centralized diagnostic facilities, vendor diagnostics, corporate boardrooms, remote control stations and even regulatory agencies.
Human Resources are now being deployed around this capability, to create what the computer world has long called the meta organization\textsuperscript{19}.

**Informing actions:** Formal communications, reporting, and feedback process was instituted along with the remote monitoring with off site staff\textsuperscript{20}.

**Figure 8: Communication Flow**

Emergence of theft prevention Agencies:

State government provided surveillance and prohibition machinery for preventing the thefts in the power sector. Power distribution companies can get the benefits of it.
Tomorrow we might see private theft prevention agencies.

Technology/Spare Parts/Raw Material Suppliers – The supply chain/Value chain companies

The emergence of these entities would strengthen the power sector. If we survey the overall business and technology priorities for 2008

Top Business Priorities

1) Business process improvements
2) Attracting and retaining new customers
3) Reducing enterprise costs
4) Improving enterprise work force effectiveness
5) Expanding current customer relationship
6) Increasing use of information and analytics
7) Targeting markets more effectively
8) Mergers and Acquisitions

Top Technological Priorities

1) Business Intelligence applications
2) Enterprise applications (ERP, ERM and others)
3) Servers and storage technologies
4) Legacy modernization, upgrade or enhancement
5) Technical infrastructure
6) Security Technologies
7) Networking, voice and data
8) Document management

The power reforms had their impacts and implications as the power sector companies: The parameters are worth considerations\textsuperscript{22}

(1) Structure
(2) Strategy
(3) System
(4) Skills
(5) Super ordinate goals
(6) Style
(7) Staff

All the seven parameters witnessed change in the post reforms process. This has led to emergence of the strategic leadership, which is having the following characteristics in descending order by the result of questionnaire.

(1) Knowledge of the subject/Knowledge management
(2) Professionally qualified
(3) Rich experience in management
(4) Rational Employer
(5) Strategy formulation and implementation
(6) Excellent change agent
(7) Problem solving nature
(8) Age factor
(9) Non political background
(10) Non bureaucratic background

A strategic leader has to face following strategic issues

(1) Change in work culture
(2) Change of corporate policies
(3) Change in regulator
(4) Change in business processes
(5) Change in operations
(6) Change in the HR policies
(7) New entries for competition
(8) Focus on business functions
(9) Loss reduction
(10) Restructuring finance function
(11) Tariff rationalization
(12) Theft prevention
(13) Consumer segmentation
(14) Strategic Enterprise Management

“Strategic Leadership: provides the vision, direction, the purpose for growth and the context for corporate success.” - By Vadim Kotelnikov23.
“All men can see the tactics whereby I conquer, but what none can see is the strategy out of which great victory is evolved.” - Sun Tzu.

“There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in introducing a new order of things” - Nicolo Machiavelli 1532 in “The Prince”. He was a key figure in Renaissance and the development of realist political theory.

The change agent/manager/leader pilots the transformation of a company into an organization of imminence by,

- Orchestrating Events
- Diagnosing the potential problems
- Developing a plan to deal with it
- Communicating to everyone and finally
- Executing it

In effect, the change leader helps a team achieve radical change or continuous change with innovation. Thus this is a sub factor in strategic leadership. Therefore it proves that

“Change is the only constant phenomenon in this ever changing world”
And for Reforms - The success is a journey and not the destination. Organizational change is an organization-wide effort to augment the effectiveness of an organization by strengthening, modifying or replacing the culture, structure, technology, task and human processes through the application of planned interventions with or without the assistance of external agents.
4.2.5.1 SUMMARY

The strategic issues in the power sector are power management, energy management, environment management, corporate restructuring of unbundled companies, technology management, new stakeholders of the power sector, financing of the power sector, application of new management tools. IT application, consumer savvy ness, human resources optimization power trading, open access, competition.

The future of Indian power sector is the process/journey from monopoly to oligopoly and then perfect competition. The strategic leadership will be a very inevitable version for managing and leading the change in the policies and then implementation phases of power companies.

Therefore we say “Success is a journey and not the destination”. The future model evolved in the researcher’s mind at the end of all examinations, questionnaires, personal interviews, secondary literature reviews etc. This can be depicted and given in the summary of the chapter.
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CHAPTER V

SUMMARY AND CONCLUSION
SUMMARY AND CONCLUSION

India is aspiring to be an economic super power by the end of this decade. After liberalization, we have witnessed tremendous progress in the service sector of India. Manufacturing sector could not keep pace with our projected growth aspirations. Amongst many reasons for this, one was lack of proper growth of power sector, which was again result of failure in creating a proper environment for large scale private participation in power generation, transmission and distribution.

Our per capita consumption is much lower than China - a country with which we immediately compare. We have high energy demand but at the same time also a shortfall of 7.4%. We have peak power demand and shortfall of 12.2%. India needs FDI of about $179 billion for generation and transmission projects to meet power demand by year 2012, as per the government's vision - “Power for All by 2012.”

“We think only when we are confronted with the problem”.

The Government of India, lately after 1991 thought of power from say 2000 AD and took some initiatives into addressing this situation of gap between the supply and demand of power. The landmark baseline has been drawn in the policy change by the Electricity Act 2003. This was followed by National Electricity policy by Central Government and 100%. FDI is allowed in all power chain segment. The operation of stand alone system in rural areas, permission to distribute the electricity by NGOs and
panchayati bodies, independence of regulator will give support to government’s efforts in rural areas where electrification of rural areas is about 45% of the total.

The state of Gujarat came into being in the year 1960. The total installed generating capacity was 315 MW in that year. In post liberalization phase Gujarat witnessed phenomenal industrial growth thereby increase in power demand. Gujarat has achieved second position on the score card among 29 states.

The change in the Economic policy has resulted into legislation aimed at liberalization through gradual process. The year 2003 saw the enactment of the Electricity Act at centre and the Gujarat electrical industry (reorganization and regulation) Act 2003. In democracy, change in the policy is implemented through corresponding legislation in the parliament or the state assemblies. Change in power policy was aimed to address the high demand from industry, households, agriculture, NGOs, Panchayatiraj institution and the process of liberalization.

The change process with respect to new world order is globalization coupled with liberalization attached with possible privatization. This means end of monopoly. In the power sector of India we have been witnessing a similar phenomenon.

The Electricity Act 2003 is the umbrella act having major advantages of the previous acts. This has provided the stage for end of the monopoly by
State Electricity Board (SEB). As in 2005, GEB made tremendous turnaround and wiped out the losses, with this, the government of Gujarat had taken a step further. That was unbundling of State Electricity Board (SEB). This came into effect from 2006. In place of GEB (Monopoly) we could see the eleven companies in power market of Gujarat. This is how the monopoly ended but the aim is to reach at the perfect competition (free market economy). Thus we have reached upto oligopoly.

To control the foul play by monopolistic vested interests and provide level playing field to all the players in the market, the role of regulator is entrusted to Gujarat Electricity Regulatory Commission (GERC) which is the state replica of Central Electricity Regulatory Commission (CERC). The CERC is having more powers and it chairs the state ERCs- Electricity Regulatory Commissions forum.

5.1 THE KEY COMPETITION - ENABLING PROVISIONS OF THE ELECTRICITY ACT 2003

The key competition - Enabling provisions of the Electricity Act 2003 can be seen as follows :-

5.1.1 GENERAL

- Establishment of independent Electricity Regulatory Commission (ERCs)
- Unbundling of State Electricity Boards (SEBs)
- Independent system operation by National load dispatch center, Regional load dispatch centers and State load dispatch centers.
- Adoption of tariff determined by bidding process.
- The regulator is empowered to issue directions to licensee / generating company if such entity abuses its dominant position, which is likely to have an adverse effect on competition.

5.1.2 GENERATION

- Generation has been de-licensed and captive generation is freely permitted.
- Generation and distribution companies are free to engage in trading without procuring a separate license for the activity.

5.1.3 TRANSMISSION AND POWER TRADING

- Non discriminatory open access to transmission system.
- Trading has been recognized as an independent activity.
- Unbundling of transmission and trading.

5.1.4 DISTRIBUTION

- Multiple distribution license in a supply area.
- Introduction of phased open access in distribution activity.
- Progressive reduction of cross subsidy.
- Distribution licensees are free to undertake generation and generators are free to undertake distribution.
It is the blueprint for infusing the competition in the power sector. But since 1947, the sector is under central and state monopoly. The monopolistic inertia is difficult to be erased overnight. The reforms in Gujarat were implemented from 2006. The GUVNL is the apex organization among seven unbundled entities from SEB. They are under corporatization process now. For them, it is change outside and inside as well. They need strategic leadership at the apex position in the corporatized entities who can manage organizational change, inside and outside.

The strategic challenges for the leaders were

1) Change of work culture
2) Change of corporate policies
3) Change in regulator
4) Change in business process
5) Change in operation
6) Change in HR Policies
7) Existence of new entities for competition
8) Increased focus on business function
9) Loss reduction by technology upgradation etc.
10) Restructuring finance function
11) Tariff rationalization
12) Loss reduction by theft prevention and decrease in cross subsidy
13) Consumer classification and Segmentation
14) Strategic Enterprises Management

This is answered by strategic leadership induction at the top management for power sector entities.

The strategic leadership qualities were identified, which was a step in the right direction for power sector. For competition, professionally rich experienced, qualified, change leaders are appropriate combinations. With the leadership, the organization of the power sector will have to become competitive.

The state of Gujarat and its power sector will see the organizational changes and coping environmental challenges by new entities or stakeholders in power sector namely Energy Saving companies (ESCO), Asset Management Companies (AMCs), Theft Prevention Agencies, Consumer Information Service companies, Environment Management Companies, Power finance companies, Meta Organizations (Convergence), Technology consultant, raw material suppliers, Spares suppliers, Plant, Process and Personal safety organization, Public-private participation (PPP) companies, Training Companies etc.

The private IPPs have relatively young, qualified, dynamic manpower and newer technology suitable to new management application tools like quality Management system, safety management, business process
4.3 CHAPTER SUMMARY

The present study as stated earlier was undertaken to study the extent to which the five basic objectives are realized. For this purpose, the researcher has tried to repeat the various findings based on literature review. Other secondary sources of information like interviewing and personal discussions and questionnaire administration. The objective wise reporting of findings are based on the above considerations.
reengineering (BPR), Six Sigma, TQM, TPM, Compared to that applied to unbundled companies by 5-S Programme, E-Urja and Jyotigram.

Out of nearly 55000 manpower, which is deployed in Gujarat Power Sector, more than 45000 employees were past SEB employees. They are to be retrained and redeployed with motivation and complacency with change in the work culture.

The key for success of these reforms lies on these human resources, their strategic leaders, technology renovation and modernization and also adequacy of financial resources/investments.

Today, Gujarat has seen remarkable achievements. Although the state has a few basic constraints of local fuel resources like lignite, coal and hydel, difficulties in getting coal linkages for the power plants and long distance from the coal pit head etc, it has tremendous geographical advantage for port based power plant using imported coal or liquid fuel like LNG, Naptha and Natural Gas. This potential is still unexploited and demand for power is slated to grow at least at the rate of 10% in coming years.

Gujarat offers site advantage for port based liquid fuel power plants. This can be extended to put up small plants at substation level too.

Up keep of existing plants, renovation and modernization (R&M) of the generation machines results in extension in life by another 20-30 years at a fraction of the cost of a new plant. By improving plant load factor to 75%, nearly 5000 million additional units can be generated in the state.
The Captive generation, promoted by private industries will ease the burden on the distribution system and will make surplus power available to grid. The co-generation will improve utilization of energy from 30% - 35% to 70%.

Gujarat has large deposits of coal bed of methane, which can be extracted from coal bed to be used for power plants.

Gujarat has plenty advantage for sources of power. But the challenge is to tap all possible resources to generate power and fulfill the growing demand from states broad based, widening, prosperous consumer base.

"The success is a journey and not the destination"
The aforesaid figure shows the present structure of the power sector consisting of only selected unbundled companies from the GEB (SEB). If they are corrected with the reforms the way forward in next figure i.e. halfway achieved from of the power sector.
Figure 10: Half Way Achieved Target Of Reforms Through the EA 2003

DEPARTMENT OF POWER

CEA

Planning Technical Advise

CERC/SERCs

Clearances, Regulation & Tariff fixation

Un-bundle the Components of ESI

Generation

Transmission

Distribution

Corporatize

Corporatize

Corporatize

Make Changes in Legislation to Facilitate entry of Private Investors

Encourage Competition

Ultimate Objectives of Efficient Utilization of Resource and availability of choice to the users
Figure 11: Suggested Model by the Researcher

1) ESCO (Energy Service Companies/Energy Audits
2) Supplier Companies (Technology/ Raw Materials/Equipments/Spares)
3) Financial Support Companies (Venture Capitalists, Investors in Infrastructure, FIs)
4) Power sector Management Consultant Companies, (Boot / Boot)
5) Training Resource & Research institute (ERDA, GETRI, NPTI, CPRI, GEDA, BEE-NPC, TERI, IGNOU, IPMG)
6) CIS (Power Customer) Customer info system/legal advise clinics for Power consumers
7) Conversion of Power Cos into Asset Management Company (AMCs)
8) Theft prevention agencies for transmission and distribution sector.
9) Corporate Social Responsibility (CSR) companies for power sector
10) Ultra Mega Power Project (UMPP), Special Economic Zone (SEZ) Management company
11) Environment Management Companies
12) Power Trading Companies
13) Renewable energy companies
14) Nuclear power Companies
15) The Bureau of Energy efficiency

The success is a journey and not the destination
The model given herein is the futuristic model of the organizations/entities with the futurist outfit of the reforms, which will help the organizations and the entire power sector, to be more and more competitive and change its face. The new stake holders in the power sector will be more equipped with the strategic leadership tools and techniques.

The strategic leadership of the future power sector will envisage two qualitative changes from the present patterns of the governance.

1) Leadership of the technology (Technology Management)

2) Leadership of the people (HR perspective)

This reformation will make the power sector company more free market economy savvy, well organized companies for anticipating the change. Competition will be the backbone of the power sector and infrastructure of our nation at present as well as in the future.