CHAPTER III

INDIAN INDUSTRY

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1. THE PRIVATE SECTOR IN INDIA: The distinction between the public sector and the private sector and, in recent years, the joint sector also, has become increasingly significant since the passing of the Industrial Policy Resolutions in 1948 and 1956, making India a mixed economy. These industrial policy resolutions clearly demarcated the scope and role of the public and private sectors. (a) The field exclusively reserved with the public sectors (b) fields in which public and private sectors can continue to exist but future development would be in the public sector alone, and (c) fields exclusively reserved for the private sector.

In a broad way, the public sector is entrusted with the responsibility of developing heavy and basic industries, social and economic infrastructure while the private sector is broadly given the right to develop consumer goods industries. While banks and financial institutions, railways, Civil aviation, power generation and distribution, etc. are in the public sector; the private sector in India embraces the whole of agriculture and allied activities, plantations, and mining. Internal trade, both retail and wholesale, much of the international trade. Road freight traffic, etc. However, as the most organized of the private sector is the corporate industrial sector. The private sector has indeed come to mean, in popular parlance, the corporate industrial sector.

Shyama Prasad Mukherji and Jawaharlal Nehru, the two architects of the Industrial Policy Resolutions of 1948 and 1956 clearly made the above distinction between the public and private sectors on the assumption that:

a) A large-scale investment in the public sector was necessary to initiate and accelerate the process of economic development;
b) A high level of public investment in infrastructure and basic and key industries was a precondition for development and expansion of the private sector; and

c) The growth and profitability of many private enterprises would depend upon public activity and on the expansion in public sector investment.

The protagonists of the mixed economy structure for India generally held that private investment was more interested in quick-yielding industries and in large profits in as short a period as possible. Naturally the private sector was considered most suitable to consumer goods industries, which involve limited risks and short gestation periods. On the other hand, public investment being autonomous was considered most suitable to low-profit yielding, long gestation and heavy investment sectors. The infrastructure industries were thus reserved for the public sector.

2. ROLE OF THE PRIVATE SECTOR IN INDIA: In western countries and in Japan, private enterprises were responsible for rapid economic development. But communist countries relied solely on public enterprises as initiators and prime movers behind rapid industrialization. India attempted to combine the advantage of both capitalist and socialist lines of development and in the Industrial Policy Resolutions of 1948 and 1956; the Government allotted a specific role to the private sector in the field of industries. The government has appreciated the dynamism of the profit motive an personal initiative of the private sector and how the private sector can introduce new processes, new varieties, new goods, etc. and how it can revolutionise the entire mode of production. Accordingly, the Government has provided opportunities to the private sector to develop and expand in certain spheres of the economy.

Private sector and General economic development: Even before Independence, the private sector was responsible for the setting up and
expansion of such industries as cotton and jute textiles, sugar, paper, edible oils, etc. from the beginning of this century, the Tatas were in the fore-front of the iron steel industry. Protection given by the Government during the 1930’s and the Second War (1939-45) stimulated industrial development. But the greatest stimulant was given to industrialization by the national government after independence. The private sector was given sufficient scope to produce intermediate goods and machines also, and as a consequence a whole range of industries producing chemicals, paint, plastics, and machine tools ferrous and non-ferrous metals, rubber, etc. have come up. India has become self-sufficient in many consumer goods. The private sector has become so capable ass to help other third world countries in their economic development.

Private sector in agriculture: The dominant sector in India is agriculture which consists of agriculture proper and other allied activates such as dairying, animal husbandry, poultry etc. this sector which is completely managed by private enterprise contributes nearly 25 percent of the domestic GNP and provided employment to nearly 60 percent of the working population in 2000-01. From this point of view, it may be though that the private sector is dominates in the case of agriculture and allied occupations. But, in practice, agriculture is not run on commercial basis and much of it is in the hands of small and marginal farmers. Accordingly, the size and the extent of the private sector in agriculture do not show characteristics of concentration and monopoly power as are founding the corporate sector.

Private sector in trading: Trading, both wholesale and retail, has always been in the private sector because the trading services can be best rendered by private businessmen. The Government is least suited to render these services. However, under conditions of scarcity, the private businessmen have the tendency to resort to hoarding and exploitation of the consumers. The Government has attempted to control and regulate private
trade through controls on price, on the movement of goods between regions, on storage, etc. In 1973, the Government of India decided to take over the wholesale trade in wheat, but the scheme fell through. In the field of international trade, however, the Government has a commanding position through the state Trading Corporation (STC) and its associate organisation like the Minerals and Metals Trading Corporation (MMTC) By and large. The private sector dominates the trading sector in the country.

Private sector in the Indian economy: The importance of the private sector in the India economy can be assessed in terms of its contribution to national income and employment. According to the latest available statistics (Refer Table 57) for the year 2000-01 the public sector, including Government administration, contributed 25 percent of the net domestic product while the private sector contributed 75 percent. The share of private sector is dominant in agriculture, forestry, fishing, small-scale industry, retail trade, construction, transport other than railways, etc.

**Table 57: Share of Public and Private Sector in Net Domestic Product (2000-01)**

<table>
<thead>
<tr>
<th>Sectors</th>
<th>Public Sector</th>
<th>Private Sector</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Agricultural, forestry &amp; fishing</strong></td>
<td>4,545 (1.7)</td>
<td>2,65,677 (98.3)</td>
<td>2,70,222 (100.0)</td>
</tr>
<tr>
<td><strong>2. Mining &amp; Quarrying</strong></td>
<td>18,348 (84.4)</td>
<td>3,386 (15.6)</td>
<td>21,734 (100.0)</td>
</tr>
<tr>
<td><strong>3. Manufacturing</strong></td>
<td>17,363 (10.9)</td>
<td>1,41,599 (89.1)</td>
<td>1,58,962 (100.0)</td>
</tr>
<tr>
<td>Sector</td>
<td>Net Value</td>
<td>Gross Value</td>
<td>Shares (%)</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>------------</td>
<td>-------------</td>
<td>------------</td>
</tr>
<tr>
<td>4. Electricity, Gas &amp; Water</td>
<td>16,673</td>
<td>-1,505</td>
<td>15,168</td>
</tr>
<tr>
<td></td>
<td>(109.9)</td>
<td>(-9.9)</td>
<td>(100.0)</td>
</tr>
<tr>
<td>5. Construction</td>
<td>10,046</td>
<td>49,450</td>
<td>59,496</td>
</tr>
<tr>
<td></td>
<td>(16.9)</td>
<td>(83.1)</td>
<td>(100.0)</td>
</tr>
<tr>
<td>6. Trade, Hotels &amp; Restaurants</td>
<td>4,863</td>
<td>1,65,759</td>
<td>1,70,622</td>
</tr>
<tr>
<td></td>
<td>(2.9)</td>
<td>(97.1)</td>
<td>(100.0)</td>
</tr>
<tr>
<td>7. Transport, Storage &amp; Communications</td>
<td>43,839</td>
<td>34,224</td>
<td>78,063</td>
</tr>
<tr>
<td></td>
<td>(56.2)</td>
<td>(43.8)</td>
<td>(100.0)</td>
</tr>
<tr>
<td>8. Finance, Insurance, Real Estate &amp; Business Services</td>
<td>44,903</td>
<td>90,723</td>
<td>1,35,626</td>
</tr>
<tr>
<td></td>
<td>(33.1)</td>
<td>(66.9)</td>
<td>(100.0)</td>
</tr>
<tr>
<td>9. Community, Social &amp; Personal Services Total</td>
<td>1,00,396</td>
<td>52,327</td>
<td>1,52,723</td>
</tr>
<tr>
<td></td>
<td>(65.7)</td>
<td>(34.3)</td>
<td>(100.0)</td>
</tr>
<tr>
<td>Total</td>
<td>2,60,976</td>
<td>8,01,640</td>
<td>10,62,616</td>
</tr>
<tr>
<td></td>
<td>(24.6)</td>
<td>(75.4)</td>
<td>(100.0)</td>
</tr>
</tbody>
</table>

Note: Figures in brackets give the share of the respective sector in net domestic product provided by the sector.


Private sector and small-scale and cottage industries: Small and cottage industries in India are in the private sector and they have an important role to play in industrial development. They are particularly suited for the utilization of local employment opportunities, as they are labour-intensive. Beside, they ensure a more equitable distribution of income and wealth and help in the effective mobilization of human and physical capital. Even though private ownership and management of the
small and cottage industrial units has inherent advantages because of the profit motive personnel initiative, the small sector has traditionally suffered from such disabilities as lack of machinery, raw materials, credit facilities, etc. The Government has come in big way to help the small sector directly in the form of technical advice purchase of machinery on a confessional hire-purchase basis, credit etc. Indirect measures to help the small sector consist of reservation of certain items for exclusive production in this sector, freedom from licensing procedures, preference to small entrepreneurs, etc. There is tremendous scope for the expansion of the small sector in the country. The really important fact that needs to be emphasized here is that the small and cottage units would continue to remain and prosper in the private sector.

3. **Limitations of the Private Sector:** The private sector has been assigned an important role in India and it has exhibited its inherent strength and superiority in the last five decades. However, it has manifested some weaknesses. In fact, the strength of the private sector—the profit motive and personal initiative also constitutes its weakness. In their lust for profit, most private enterprises have adopted undesirable practices, which have gone against the consumers on the one side and thwarted the growth of medium and small-scale industrial unit on other. Besides, many of the leading business and industrial houses have become monopolistic and got concentration of wealth and economic power in their hands. Finally, private sector units, both large and small, have been subject to frequent industrial disputes and industrial sickness, forcing the Government sometimes to take them over. Some of the important weaknesses and limitations of the private corporate sector are:

a) **Emphasis on non-priority industries:** An important criticism of the private corporate sector is that it has helped in the expansion of consumer goods industries having low priority, such as man-made fibers, perfumes and cosmetics, air conditioners and TV, etc. These
goods were meant to satisfy the consumption needs of elitist groups but they yielded quick profits. The growth of consumer goods industries of low priority on the one side and the relatively sluggish growth of essential consumer goods industries on the other was responsible for a distorted output structure in the country.

b) Emergence of monopoly power and concentration: With the operation of the planning process since 1951 and with the rapid expansion of the economy, some of the business and industrial houses were able to take advantage of all the facilities provided by the Government and acquire monopolistic power. They were able to use the licensing system to prevent rivals from entering the sectors in which they were interested, and through the use of unfair and restrictive trade practices, they had succeeded in eliminating their rivals. They have also acquired phenomenal wealth and economic power. This trend has, however, accelerated after the introduction of economic reforms in 1991. not only the Indian business houses, but even the foreign business firms have accumulated tremendous economic power.

c) Industrial disputes: The private sector is plagued by poor industrial relations and the valuable man-days lost due to strikes and lockouts since Independence have been enormous. Industrial disputes are but natural in the private enterprises since the interests of capitalist owners and those of the workers are diametrically opposite. Whole the private capitalist are interested in the maximization of profits, the workers aim at securing higher wages and other benefits are interested in the maximization of profits, the workers aim at securing higher wages and other benefits. Wages and allowances, hours of work, bonus, leave privileges, the recognition of unions, victimization of workers, retrenchment, etc. are important causes of industrial disputes in India. The country has suffered heavily in terms
of loss of production on account of industrial disputes; there is conclusive evidence available that industrial relations in the private sector are much worse than those in the public sector. Lockouts are a phenomenon exclusively confined to the private sector. Similarly, the frequency and duration of strikes is much greater in the private sector.

d) Industrial Sickness: A common feature of the private sector is the growing industrial sickness in many lines of industrial and business activity. Engineering industry, cotton and jute textiles were prone to industrial sickness, but these days almost all industries large, medium and small units face this problem. Inefficient and failure to evolve correct marketing strategy, poor labour relations, and finally wrong government policies all these are responsible for growing industrial sickness in the country.

The basic limitation of the private sector was that it was given a significant role in economic development it was given a significant role in economic development in the initial phase. Assuming that the private sector could not mobilize enough resources and that the public sector alone was best qualified to run the commanding heights, the Government entrusted the capital goods and basic industries to the public sector and made it the prime mover of economic development. Naturally, the private sector had to be satisfied with the secondary role assigned to it.

Prospects

The government assigned a secondary role to the private sector for a long time but the Sixth Plan (1980-85) gave greater importance to the private sector and nearly 47 percent of the total investment was to be in the private sector. The private sector too has shows sufficient buoyancy and has registered a fast rate of growth by rising increasing amount of funds in
the capital market a setting up a series of joint ventures in other countries. However, as the Sixth Plan itself expressed clearly, “in a large number of areas, our capabilities are almost 20 years behind those in the advance nations and also behind those established recently in developing countries”. To overcome these, the Government has been taking a series of measures to give a boost to the private sector; as for example, allowing automatic expansion of capacity to a large number of industries special facilities for the setting up of export-oriented units, exemption from MRTP restrictions on industries producing of export, easy industrial licenses for new units located in “zero industry” districts, quick and sympathetic processing of license applications, liberalization of import and pricing policies, etc.

The Industrial Policy of 1991 further liberalized the economy in favour of the private sector by removing the asset limit of MRTP Companies and thus freed large business houses to undertake investments. In short, a greater role for the private sector is envisaged in the new industrial Policy by removing the barriers and controls and following a more liberalized approach.

PUBLIC SECTOR

4. THE EVOLUTION OF THE PUBLIC SECTOR IN INDIA

Prior to 1947, there was virtually no “Public Sector” in the Indian economy. The only instances worthy of mention were the Railways, the Posts and the Telegraphs, the Port Trusts, the ordnance and Aircraft Factories and a few State managed undertakings like the government salt factories, quinine factories, etc. the idea that economic development should be promoted by the state actually managing industrial concern did not take root in India before 1947, even though the concept of planning was very much discussed by Congress governments in the Indian provinces.
However, in the post-independence period, the part of the 1956 Industrial Policy.

The Industrial Policy Resolution 1956 gave the public sector a strategic role in the Indian economy. For one thing, at the time of independence, the country was backward and underdeveloped — basically an agrarian economy with a weak industrial base, heavy unemployment, low level of savings and investment and near absence of infrastructure facilities, Indian economy needed a big push. This push could not come from the Indian private sector, which was starved of funds and of managerial ability and was incapable of undertaking risks involved in large long-gestation investments. It was assumed at that time that only the government intervention in big planned way could accelerate agricultural and industrial production, expand employment opportunities, reduce poverty, etc. In other words, the public sector was thought of as the engine for self-reliant economic growth to develop a sound agricultural and industrial base, diversify the economy and overcome economic and social backwardness.

To this basic argument for the expansion of the public sector, the government added additional reasons over time, e.g.:

a) To accelerate the growth of the core sectors of the economy;

b) To serve the equipment needs of strategically important sectors like Railways, Telecommunications, Nuclear power and Defense etc.

c) To exert countervailing power on the operation of private monopolies and multinationals in selected areas;

d) To ensure easier availability of articles of mass consumption, to check prices of important articles etc. the rationale behind setting up consumer oriented industries;

e) To protect employment, the government was forced to take over sick industrial units;
In fact, over a period of time, the government entered into many sectors for all types of good and bad reasons and in many cases for no reasons at all.

Central Government Enterprises

As on March 31, 2002, there were 242 central Government undertakings, excluding banks, financial institutions and departmental undertakings like the Railways, ports etc. the growth of investment in Central Government undertakings shown in table 58. It will be clear from the table that since 1951, the number of industrial and commercial undertakings of the Central Government had increased from 5 in 1950-51 to 240 units in 2001-2002 and the capital investment had increase from Rs. 29 crores to Rs. 3,24,632 crores on 31st capital and long-term loans.

Public Enterprises Survey

2001-2002 gives some interesting information regarding the pattern of investment (Table 32). Bulk of the investment is in those producing and selling goods; at the end of March 2002, over Rs. 1,97,400 crores, of 60.8 percent of investment was in these industries. Even here, bulk of the investment (about 53 percent) is in basic industries like Steel, Coal, Power, Petroleum fertilizers, etc. Nearly 36 percent of investment is in enterprises rendering services; of these, the most prominent are financial services (17.8 percent).

**Table: 58 Growth of Investment in Central Government Enterprises**

<table>
<thead>
<tr>
<th>As on March 31</th>
<th>No. Of Units</th>
<th>Total Investment (Rs. Crores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951</td>
<td>5</td>
<td>29</td>
</tr>
<tr>
<td>1961</td>
<td>47</td>
<td>950</td>
</tr>
<tr>
<td>1980</td>
<td>179</td>
<td>18,150</td>
</tr>
<tr>
<td>Year</td>
<td>Investment (Rs. Crores)</td>
<td>Percent of Total</td>
</tr>
<tr>
<td>------</td>
<td>-------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>1990</td>
<td>244</td>
<td>99,330</td>
</tr>
<tr>
<td>2001</td>
<td>242</td>
<td>2,74,198</td>
</tr>
<tr>
<td>2002</td>
<td>240</td>
<td>3,24,632</td>
</tr>
</tbody>
</table>

**Source:** Government of India, public enterprise survey, (2001-2002).

Among services, the most important were financial services accounting for Rs. 57,836 crores (17.8 percent), followed by and Telecommunication Services 8.2 percent.

**Table 59: Break-Up Of Investment In Central Government Enterprises (2002-2002).**

<table>
<thead>
<tr>
<th>Category</th>
<th>Investment (Rs. Crores)</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Enterprises under construction</td>
<td>10,349</td>
<td>3.2</td>
</tr>
<tr>
<td>2. Enterprises producing / selling goods</td>
<td>1,97,408</td>
<td>60.8</td>
</tr>
<tr>
<td>Power</td>
<td>46,013</td>
<td>14.2</td>
</tr>
<tr>
<td>Steel</td>
<td>23,536</td>
<td>7.3</td>
</tr>
<tr>
<td>Coal &amp; lignite</td>
<td>27,279</td>
<td>8.4</td>
</tr>
<tr>
<td>Petroleum</td>
<td>36,735</td>
<td>11.3</td>
</tr>
<tr>
<td>Fertilizers</td>
<td>18,122</td>
<td>5.6</td>
</tr>
<tr>
<td>Chemicals &amp; pharmaceutics</td>
<td>5,989</td>
<td>1.8</td>
</tr>
<tr>
<td>Minerals &amp; metals</td>
<td>5,665</td>
<td>1.7</td>
</tr>
<tr>
<td>Engineering</td>
<td>9,043</td>
<td>2.8</td>
</tr>
<tr>
<td>Textiles</td>
<td>18,715</td>
<td>5.8</td>
</tr>
<tr>
<td>Consumer goods</td>
<td>3,210</td>
<td>1.0</td>
</tr>
<tr>
<td>Transportation equipment</td>
<td>2,976</td>
<td>0.9</td>
</tr>
<tr>
<td>Agro-based industries</td>
<td>125</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>3. Enterprises producing Services</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Services</td>
<td>57,836</td>
<td>17.8</td>
</tr>
<tr>
<td>Industrial Development and Technical Consultancy Services</td>
<td>14,780</td>
<td>4.6</td>
</tr>
<tr>
<td>Transportation Services</td>
<td>6,919</td>
<td>2.1</td>
</tr>
<tr>
<td>Telecommunication Services</td>
<td>26,495</td>
<td>8.2</td>
</tr>
<tr>
<td>Other Services</td>
<td>10,845</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>3,24,632</td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Source:** Compiled from Government of India, Public Enterprises Survey (2001-2002). Vol. I.

The giant top 10 enterprises in the Central Public Sector (Table 60) accounted for a total investment of Rs. 1,48,193 crores on 31st March 2002 (46% of total investment of Rs. 3,24,632 crores in 240 enterprises).

As a result of the deliberate policy of encouraging public sector, heavy investment was made in the public sector, so as to facilitate the process of industrialization in the country, by establishing heavy and basic industries an create infrastructure of power, electricity and transport. Except for the short span of five years (1968-69 to 1973-74) in which growth rate of investment was about 10 percent, throughout the rate of growth of investment averaged between 16 and 19 percent annum.
**Table 60: Top 10 Enterprises in Terms of Investment**

<table>
<thead>
<tr>
<th>Name of the Enterprise</th>
<th>Rs. Crores as on 31.03.2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bharat Sanchar Nigam Ltd.</td>
<td>23,129</td>
</tr>
<tr>
<td>2. National Thermal Power Corporation Ltd.</td>
<td>19,394</td>
</tr>
<tr>
<td>3. Housing &amp; Urban Development Corp. Ltd.</td>
<td>18,046</td>
</tr>
<tr>
<td>4. Steel Authority of India</td>
<td>13,571</td>
</tr>
<tr>
<td>5. Power Grid Corporation of India Ltd.</td>
<td>13,342</td>
</tr>
<tr>
<td>6. India Railway Finance Corp. Ltd.</td>
<td>13,130</td>
</tr>
<tr>
<td>7. Rural Electrification Corp. Ltd.</td>
<td>12,322</td>
</tr>
<tr>
<td>8. National Hydro-electric Power Corp. Ltd.</td>
<td>11,906</td>
</tr>
<tr>
<td>9. Power Finance Corp.</td>
<td>11,870</td>
</tr>
<tr>
<td>10. Indian Oil Corp. Ltd.</td>
<td>11,481</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,48,193</strong></td>
</tr>
</tbody>
</table>

**Source:** Public Enterprises Survey (2001-2002), Vol. I.

In terms of investment, Bharat Sanchar Nigam Ltd. topped the list of 10 enterprises in the Central Public Sector in India, followed by National Thermal Power Corporation Ltd. but in terms of gross turnover in 2001-2002, Indian Oil Corp. Ltd. topped the list with a total turnover of Rs. 1,14,864 crores, followed by Hindustan Petroleum Corporation Ltd. Rs.44, 434 crores and Bharat Petroleum Corp. Ltd. 39,830 crores. Taking these
three petroleum companies, it may be noted that they accounted for Rs. 1,99,128 crores or 41.6 percent of the total turnover of all CPSUs.

**Table 61: Top 10 Enterprises in Terms of Turnover (2001-02).**

<table>
<thead>
<tr>
<th>Name of the Enterprises</th>
<th>Rs. Crores</th>
<th>% or Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Indian Oil Corp. Ltd.</td>
<td>1,14,864</td>
<td>24.0</td>
</tr>
<tr>
<td>2. Hindustan Petroleum Corp. Ltd</td>
<td>44,434</td>
<td>9.3</td>
</tr>
<tr>
<td>3. Bharat Petroleum Corp. Ltd.</td>
<td>39,830</td>
<td>8.3</td>
</tr>
<tr>
<td>4. Food Corp. of India</td>
<td>31,556</td>
<td>6.6</td>
</tr>
<tr>
<td>5. Bharat Sanchar Nigam Ltd.</td>
<td>24,300</td>
<td>5.1</td>
</tr>
<tr>
<td>6. Oil and Natural Gas Corp. Ltd.</td>
<td>23,233</td>
<td>4.8</td>
</tr>
<tr>
<td>7. National Thermal Power Corp. Ltd.</td>
<td>17,911</td>
<td>3.7</td>
</tr>
<tr>
<td>8. Steel Authority of India</td>
<td>15,684</td>
<td>3.3</td>
</tr>
<tr>
<td>9. Gas Authority of India Ltd.</td>
<td>10,573</td>
<td>2.2</td>
</tr>
<tr>
<td>10. IBP Co. Ltd.</td>
<td>8,453</td>
<td>1.8</td>
</tr>
<tr>
<td><strong>Sub total (1 to 10)</strong></td>
<td><strong>3,30,837</strong></td>
<td><strong>69.1</strong></td>
</tr>
<tr>
<td><strong>Total Turnover of all enterprises</strong></td>
<td><strong>4,78,728</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>


**Total Investment in Public Sector**
Central Government Public Sector Enterprises recorded a total investment of Rs.3, 24,632 crores in 2000-01. The state level Public enterprises accounted for Rs.1, 62,000 crores as on 31.3.2000. Besides them departmental like Railways, Posts and Telegraphs and other departments account for an investment of nearly Rs. 20,000 crores. If all these are included, then the total public sector investment in the entire country, in all kinds of enterprises (departmental and non-departmental), at the Center, State and local level, would be around Rs. 5,16,630.

Objectives of public Sector

We conclude this section by broadly summarizing the objectives of setting up public enterprises in India.

i. To promote rapid economic development through creation and expansion of infrastructure

ii. To generate financial resources for development;

iii. To promote redistribution of income and wealth;

iv. To create employment opportunities.

v. To promote balanced regional growth.

vi. To encourage the development of small scale and ancillary industries; and

vii. To promote exports on the one side and import substitution, on the other

5. ROLE OF THE PUBLIC SECTION IN INDIA

After the attainment of independence and the advent of planning, there has been a progressive expansion in the public sector. The passage of Industrial Policy Resolution of 1956 and the adoption of the socialist Patten of society as our national goal further led to a deliberate enlargement of the role of public sector.
To understand the role of the public sector, we must have a comprehensive view of the entire public sector. We should include besides autonomous corporations, the departmental enterprises. While doing so, not only the enterprises owned and run by the Central Government be covered, but the enterprises run by the State Governments and local bodies should also be included.

It would not be appropriate to use single measure to estimate the role of the public sector in the Indian economy, rather it would be desirable to use few indicators, e.g., employment, investment, value of output, national income generated, saving, capital formation and capital stock.

**Share of public sector in employment**

There are two important categories of public sector employment (a) Government administration and defense and other government services like health, education, research and various activates to promote economic development; and (b) public sector proper i.e. economic enterprises owned by the Center, state and local government table 61 shows the size and growth of employment in the organized sector since 1971. The total number of workers employed in the public sector in 1971 was 111 Lakhs, but by March 2001, their number grew to about 191 lakhs. Since employment in the public sector is confined to the organized sector, public sector employees 69 percent of the workers employed in organized sector of the Indian economy.

**Table 62: Public and Private Sector Employment of India**

<table>
<thead>
<tr>
<th></th>
<th>Public Sector</th>
<th>Private Sector</th>
<th>Total</th>
<th>(In lakhs) as % of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>111</td>
<td>67</td>
<td>178</td>
<td>62</td>
</tr>
<tr>
<td>1981</td>
<td>155</td>
<td>74</td>
<td>229</td>
<td>68</td>
</tr>
<tr>
<td>1991</td>
<td>190</td>
<td>77</td>
<td>267</td>
<td>71</td>
</tr>
</tbody>
</table>

From table 63, it may be noted that 51 percent of the total employment (i.e. 191 lakhs) in the public sector was in Government administration and community and personal services and the balance 49 percent was spread in other economic enterprises run by the Center State and local governments. The biggest chunk of employment in economic enterprises was in transport, storage and communications of the order of about 30 lakhs and next persons employed in agriculture and other allied activates reflect employment under Employment Guarantee Scheme rather than any productive activity in the normal sense.

The share of public sector in total employment in the organizes sector (public plus private) reveals that in the transport and communications, electricity, gas and water and construction, the share of the public sector is in the rage of 95-98 percent, a situation of total dominance. These are the traditional areas, which have been the exclusive preserves of the public sector since the days of the British rule. However, in manufacturing, the share of the public sector was about 27 percent of the total since its entry in this coal mines and takeover of 20 major commercial banks, there has been a significant improvement in the position of the public sector. In an overall sense, the public sector is a big employer (70 percent of total) in so far as the organized sector of the Indian economy is concerned.

**Table 63: Employment in The Public Sector In 2001**

<table>
<thead>
<tr>
<th>(Lakhs) percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>1. Manufacturing</td>
</tr>
<tr>
<td>2. Transport, storage</td>
</tr>
<tr>
<td>and communications</td>
</tr>
<tr>
<td>3. Financing,</td>
</tr>
<tr>
<td>insurance, real estate and business services</td>
</tr>
<tr>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>4. Government administration, community, social and personal sector</td>
</tr>
<tr>
<td>5. Other sectors</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

**SOURCE:** Compiled and computed from government of India Economic Survey (2002-2003).

**Share of the Public Sector in GDP**

During the last five decades, the share of the public sector in net domestic product (NDP) has shown a steady improvement. Measured at current prices, public sector accounted for 7.5 percent of NDP in 1950-51, its share in 1999-2000 had risen to 24.0 percent. However, it declined to 22.4 percent in 2001-02. Public sector, therefore, accounts for about one-fourth of national output. This is largely due to rapid expansion of the public sector enterprises.

There is a big increase in the share of public administration and defense from 4.5 percent to 10.2 percent between 1950-51 and 2001-02. The share of public sector enterprises however raised form 3 percent in 1950-51 to 13.0 percent in 1990-00 but declined to 11.7 percent in 2001-02. Despite this fact, the private sector still occupies a dominant position in economy. There are some sectors such as agriculture and small-scale sector in which the share of the state is almost zero. However, in insurance, civil aviation, defense equipment, indigenous, crude oil production etc. government ownership is cent percent. Increasingly, industries of strategic and national importance are being brought under state ownership.
Share of the public sector in saving and capital formation

Gross domestic capital formation has increased from 10.7 percent of GNP during the first plan to 24.6 percent during the Eighth plan. (Refer table 64).

However, the share of the public sector improved from 3.5 percent during the first plan (1951-56) to 9.2 percent during the Eighth Plan. The share of the public sector, which accounted for one-third of capital formation during the first plan gradually increase to about one-half during the Sixth Plan, an has thereafter declaimed to about 26.6 percent in 2001-02.

However, the share of savings by the public sector has not undergone a similar change. The share of the public sector in gross domestic saving rose from 1.7 percent of GNP during 1951-56 to merely 4.6 percent during the fifth plan but declined thereafter and touched a low of 1.4 percent during Eight h Plan. This share became negative during 1999-00 and 2001-02. In relative terms, the share of public sector improved marginally from 17 percent during 1951-56 to 21 percent during 1974-79 (fifth plan period) and thereafter declined continuously till it touched a low level of 6.3% of total savings during the Eighth Plan and further low of 4.5% in 1997-98.

**Table 64: Share Of Plan And Private Sectors In Gross Domestic Savings And Gross Domestic Capital Formation**

<table>
<thead>
<tr>
<th>Averages for Plan periods</th>
<th>As % of GDP at market prices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public Sector</td>
</tr>
<tr>
<td>Gross Domestic Savings</td>
<td></td>
</tr>
<tr>
<td>First Plan: 1951-56</td>
<td>1.7</td>
</tr>
<tr>
<td>Second Plan: 1956-61</td>
<td>2.0</td>
</tr>
<tr>
<td>Period</td>
<td>Savings 1</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Third Plan: 1961-66</td>
<td>3.4</td>
</tr>
<tr>
<td>Fourth Plan: 1969-74</td>
<td>3.0</td>
</tr>
<tr>
<td>Fifth Plan: 1974-79</td>
<td>4.6</td>
</tr>
<tr>
<td>Sixth Plan: 1980-85</td>
<td>3.6</td>
</tr>
<tr>
<td>Seventh Plan: 1985-90</td>
<td>2.3</td>
</tr>
<tr>
<td>Eight Plan: 1992-97</td>
<td>1.4</td>
</tr>
<tr>
<td>1997-98</td>
<td>1.0</td>
</tr>
<tr>
<td>2001-02</td>
<td>-2.5</td>
</tr>
</tbody>
</table>

**Gross Domestic Capital Formation**

<table>
<thead>
<tr>
<th>Period</th>
<th>Savings 1</th>
<th>Savings 2</th>
<th>Savings 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Plan</td>
<td>3.5</td>
<td>7.2</td>
<td>10.7</td>
</tr>
<tr>
<td>Second Plan</td>
<td>6.6</td>
<td>8.8</td>
<td>15.4</td>
</tr>
<tr>
<td>Third Plan</td>
<td>8.4</td>
<td>8.3</td>
<td>15.4</td>
</tr>
<tr>
<td>Fourth Plan</td>
<td>7.2</td>
<td>10.9</td>
<td>18.1</td>
</tr>
<tr>
<td>Fifth Plan</td>
<td>9.5</td>
<td>11.7</td>
<td>21.2</td>
</tr>
<tr>
<td>Sixth Plan</td>
<td>113.1</td>
<td>10.5</td>
<td>21.6</td>
</tr>
<tr>
<td>Seventh Plan</td>
<td>10.7</td>
<td>12.1</td>
<td>22.8</td>
</tr>
<tr>
<td>Eighth Plan</td>
<td>9.2</td>
<td>15.4</td>
<td>24.6</td>
</tr>
<tr>
<td>1997-98</td>
<td>6.5</td>
<td>18.7</td>
<td>25.2</td>
</tr>
<tr>
<td>2001-02</td>
<td>6.3</td>
<td>14.4</td>
<td>23.7</td>
</tr>
</tbody>
</table>


There basic causes for the decline of the share of the public sector in total savings.
i. Rapid increase in state expenditure at a rate higher than increase in state revenues.

ii. The inefficiency of the government and the public sector enterprises and their consequent failure to generate internal surplus commensurate with the increase in their capital stock.

iii. The self-defeating effort of the government to make up the shortfall in resources through excessive borrowings from the banking sector (better known as deficit financing).

Accordingly the savings of the private sector had to be diverted to the public sector so that it can meet its expanding obligation in the process of development, this fact however does not absolve the public sector to generate adequate internal surplus by improving its efficiency.

Share of the public sector in gross fixed capital formation

The term capital stock refers to the total stock of plant and machinery, equipment and tools and other capital goods available at a point of time for further production. However, the term investment (of gross capital formation) refers to annual flow of goods partly to meet the needs of depreciating of the capital stock and partly to increase the size of the total capital stock on a net basis.

But the amount of capital employed per unit of output in the public sector is far greater then in the private sector. This is largely due to the differences in the nature of investment in the public sector. The important differences are:

i. A goods part of the public sector investment goes into economic infrastructure (toads, buildings, irrigation works, bridges etc.), which is essential for economic development but does not contribute to output in the normal sense of the term.
ii. Public sector has played a significant role in developing the key sectors of the economy e.g., railways, iron and steel, power, oil exploration, irrigation, etc. Their very nature are areas of high capital intensity.

iii. The projects in the public sector have longer gestation periods. Partly this is due to the technological nature of investment in heavy and basic industries and partly it is due to the inefficiencies in public agencies in the installation of these projects.

iv. There is lower utilization of capacities in the public sector and this is also responsible to an extent to lower output capital ratios.

v. Areas of higher output-capital ratios fall largely of wholly in the private sector. This includes consumer goods industries, small-scale and cottage enterprises and agriculture.

**TABLE 65: PUBLIC SECTOR GROSS FIXED CAPITAL FORMATION AT 1980-81 PRICES**

<table>
<thead>
<tr>
<th>Year</th>
<th>Value in Rs. Crores</th>
<th>Compound Annual Growth Rule (percent per Annum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950-51</td>
<td>1,640</td>
<td></td>
</tr>
<tr>
<td>1960-61</td>
<td>5,160</td>
<td>12.1</td>
</tr>
<tr>
<td>1970-71</td>
<td>6,330</td>
<td>2.0</td>
</tr>
<tr>
<td>1980-81</td>
<td>11,770</td>
<td>6.3</td>
</tr>
<tr>
<td>1993-94</td>
<td>184,293</td>
<td></td>
</tr>
<tr>
<td>2001-02</td>
<td>324,549</td>
<td>8.4</td>
</tr>
</tbody>
</table>

*At 1993-94 prices

Data given in table 65 reveal that gross fixed capital formation (GGCF) during 1950-51 to 1960-61 was of the order of 12.1 percent per annum. This was natural consequence of the enthusiasm generated in the second plan to undertake the massive development of heavy and basic industries. However, this process of acquiring new plants and undertaking investment in hither to unexplored areas did continue up to 1965-66 when GFCF shot up to the peak level of Rs. 7,870 crores, but the drought of 1965-66 and the recession that followed in 1966-67 reversed the trend and the annual growth rate slumped to 2 per cent during the 1960s. Later it picked up to 6.3 during seventies and 6.1 percent during the eighties. Thus public sector has made a tremendous contribution in improving Gross Fixed Capital Formation more especially in the capital goods sector and thus laid the foundations of a strong industrial base in India. During 1993-94 and 2001-02, however GFCF growth rate was of the order of 8.4 percent at 1993-94 prices.

Volume of Sales / Income of the public Sector

Table 66 explains the trend of growth of sales in Central public enterprises. In 1987-88, percentage of sales to capital employed (CE) was 146 and this ratio declined to 123 percent in 2001-2002. Between 1987-88 and 2001-2002, the annual average growth rate of sales was 13.5 percent. This is an “eloquent measure of the dynamic expansion of the public sector in India”.

Infrastructure Development by the Public Sector

Rapid industrialisation of a backward but developing country likes India depends upon the creation of infrastructure of economic overheads such a transportation, communication, power development, basis and key industries, etc. unless the infrastructure is created, it is not possible for other industries to come into existence or to develop for other industries to come into existence or to develop fast enough. But the development of basic and capital goods industries and creation of infrastructure involves
heavy investment, low yield and long gestation period. These investments were therefore, not attractive to the private sector not could the private sector raise such huge resources in the fifties and sixties. Naturally, it was left to the Government to develop them and most of the public enterprises were set up in these industries. The private sector welcomed government investment in developing these industries, as it stood to gain directly.

In fact, the basic rationale of public enterprises soon after India launched ambitious economic plans was to create and expand the infrastructure and this they have done quite successfully, by and large. Their contribution to the Indian economy should therefore, be judge from this angle and not from the point of view of profit alone.

**Table 66: Growth of Sales In Public Sector Enterprises**

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales Turnover</th>
<th>Capital Employed</th>
<th>% Sales to CE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987-88</td>
<td>81,270</td>
<td>55,620</td>
<td>146</td>
</tr>
<tr>
<td>1990-91</td>
<td>1,18,680</td>
<td>1,02,080</td>
<td>116</td>
</tr>
<tr>
<td>2001-02</td>
<td>4,78,728</td>
<td>3,90,261</td>
<td>123</td>
</tr>
</tbody>
</table>

Annual Average growth rate between

| 1987-88 to 2001-2002 | 13.5 | 14.9 | - |

**Strong Industrial Base in India**

Despite many criticisms against the public sector enterprises, there is no denying the fact that rapid industrialisation in the first three decades after independence was mainly due to the public sector. The Industrial policy Resolutions reserved certain industries-atomic energy, ammunition and armaments, aircraft, etc. with the government in the interest of national security. The state also took the responsibility for the development of key industries such as coal, iron and steel, aircraft, ship-building, etc. the rest of the industries were left to the private sector. But the experience of the first
three plans showed clearly that the private sector had inherent handicaps and that it was not suitable for rapid industrial development. At the same time, the planning commission realised that a much more diversifies development in the field of industries was necessary if Indian economy had to industries was necessary if Indian economy had to become self-generating. Naturally, the government had to come in big way to undertake the development of basic and strategic industries, capital goods industries and even some consumer goods industries. A strong industrial base has been laid, though there are still many weaknesses and gaps in the industrial structure of the country. Credit has to be given to the public sector for this achievement. Even after the introduction of economic reforms, private sector investment has not increases as expected and it is being suggested that the public sector should take up the responsibility of infrastructure development.

**Dominance of public sector in critical areas**

Public sector has entered into a wide spectrum of industries and products. Its operations extend from basic and capital goods like steel, coal, copper, zinc, and other minerals, heavy machinery on the one hand and on the other, we find drugs and chemicals, fertilizers, consumer goods like textiles, hotel services, watches, bred, etc. most of these industries have a strategic importance in the India economy since they have high linkages.

In highly critical areas such a copper, lead, coal, petroleum products, hydro and steam turbines the share of public sector is 100 percent. Inquire a large number of products, it ranges between 50 to 95 percent.

**Role of public sector in Export Promotion**

Most of the public sector enterprises have been started keeping in mind the requirements of the Indian economy, in the fields of production and distribution. However, some public enterprises have done much to promote India’s exports. The State Trading Corporation (STC) have done a wonderful job of expert, has been due to the pioneering efforts of these
organisation. Considerable success has been achieved in pushing up the exports of India handicrafts, light engineering goods and many other new items of exports. Hindustan Steel Ltd., the Bharat Electronics Ltd., the Hindustan Machine Tools, etc. are some of the public enterprises which are exporting increasing proportion of their output and earning foreign exchange. For instance, the HSL has made huge strides in the field of exports.

The foreign earnings of the public sector enterprises have been rising from Rs.35 crores in 1965-66 to Rs. 5,830 crores in 1984-85 and finally to Rs. 20,886 crores in 2001-02. There is no denying the fact that the export performance of the public sector enterprises has been quite creditable.

Role of the Public Sector in Import Substitution

Some public sector enterprises were started specifically to produce goods which were formerly imported and thus to save foreign exchange the entry of Hindustan Antibiotics Ltd. and the Indian Drugs and Pharmaceuticals Ltd. (IDPL) into the manufacture of drugs and pharmaceuticals so as to remove the monopolistic stranglehold of foreign concerns in this field helped India save foreign exchange used for importing these items. Likewise, the Oil Corp. Ltd., are public enterprises, which attempt directly to increase self-reliance of the country and reduce our dependence on imports. The Bharat Electronics Ltd. had saved foreign exchange by way of import substitution. Complete self-sufficiency may not be possible at present, but a determined effort should be made to achieve this goal in the shortest possible time.

Role of Public Sector in raising internal resources

The generation of internal resources by the public sector has assumed greater importance because, in addition to financing their own planned expansion and development, they are also expected to generate surplus for financing the needs of other priority sectors.
Internal resources consist of depreciation and retained profits. With every five-year plan, the public sector was able to mobilize large internal resources. During the Sixth Plan (1980-81 to 1984-85), internal resources, amounting to Rs. 14,710 crores were generated Rs. 2,940 crores per annum on the average. During the Seventh Plan internal resources of the order of Rs. 1,01,212 crores a creditable record indeed. During 2001-2002, internal resources generation was of the order of Rs. 52,545 crores; it is really encouraging to note that Central public enterprises have succeeded in increasing their internal resource generation over the years. This trend should be welcome.

Contribution to the Exchequer

Apart from generation of internal resources an payment of dividend, public enterprises have been making substantial contribution to the Government exchequer through payment of corporate taxes, excise duty, customs duty an other duties, in this way they help in mobilizing funds for financing the needs for the planned development of the country. Table 67 illustrates the growth of contributions of public sector enterprises to Central exchequer. We include here (a) corporate tax (b) Central excise duty (c) customs duties and (d) other duties.

**Table 67: Contribution Of Public Enterprises To Central Exchequer**

<table>
<thead>
<tr>
<th>Year/Period</th>
<th>Amount Total (Rs. Crores)</th>
<th>Contributed Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sixth Plan (1980-85)</td>
<td>27,570</td>
<td>5,510</td>
</tr>
<tr>
<td>Seventh Plan (1985-90)</td>
<td>69,410</td>
<td>13,880</td>
</tr>
<tr>
<td>Eighth Plan (1992-97)</td>
<td>1,33,780</td>
<td>26,760</td>
</tr>
<tr>
<td>1997-98 and 2001-02</td>
<td>2,69,110</td>
<td>53,822</td>
</tr>
</tbody>
</table>

* Figures rounded
It is clear from table 10 that public enterprises contributed Rs. 27,570 crores during the Sixth Plan but as much as Rs. 1,33,780 crores during the Eighth Plan. From an annual average for Rs. 5,510 crores during the Sixth Plan, the contribution of public enterprises has increased to Rs. 53,822 crores during 1997-2002.

Thus, from every angle, the public sector has grown in importance and has come to occupy a prominent place in the Indian economy. What we have described above relates mostly to enterprises in the Central sector. We do not, however, have adequate statistics for state public sector enterprises and the little information we have of them is no flattering to the states.

6. CAUSES FOR THE EXPANSION OF PUBLIC ENTERPRISES

In a developing economy like India, some industries had to be brought within public ownership and control, for otherwise rapid growth of the economy was thought to be impossible. Nationalizing some of the industrial, baking and insurance units and starting new units were expected to help in speeding up the rate of economic growth. Therefore, public enterprises became an essential part of the economic development programme of India. In this section, we shall study the need for or the rationalable of public enterprises in the context of economic planning in India.

i. Rate of Economic Development and Public Enterprises: The justification for public enterprises in India was based on the fact that the rate of economic development planned by the government was much faster than could achieved by the private sector alone. In other words, the public sector was essential to realise the target of the high rate of development deliberately fixed by the government.

To fulfill this ambitious plan target, the government had to resort to compulsory saving through taxation. In the words of Professor
Ramanadham, "Having gathered the resources, the government and other important policy making bodies like the Planning Commission are under the normal human temptation to use the funds under the government's own aegis and it appears to be an avoidable botheration for the administration to offer the money to private enterprises in the first instance and then go about instituting the necessary checks and balances for the sake of ensuring the safety and proper use of funds. Instead it appeals as preferable to Parliament as well as the administrative bodies to launch industrial enterprises in the public sector."

ii. Pattern of Resource Allocation and Public Enterprises: In Professor Ramanadham's words, "the main reason for the expansion of the public sector lies in the pattern of resources allocation decided upon under the plans." In the Second Plan the emphasis was shifted to industries and mining, mainly basic and capital goods industries to be developed under the aegis of the public sector. Thus more resources for sector. Under these circumstances, "It is inevitable that the public sector must grow not only absolutely but also relatively to the private sector."

iii. Removal of Regional Disparities through Public Enterprises: Another important reason for the extension of the public sector was the anxiety for balanced development in different parts of the country and to see that there were no serious regional disparities. Public enterprises of the Central Government were set up in those regions which were underdeveloped and where local resources were not adequate. Good examples are the setting up of the three steel plants at Bhilai, Rourkela and Durgapur and the Neyveli Project in Madras, which were meant to help industrialise the regions surrounding the projects. In certain cases, the State Governments were unable to raise adequate resources for development of its regions. The only alternative available was the setting up of projects
by the Central Government of to start enterprises, which were financed by the Center.

iv. Sources of funds for Economic Development: Initially, state was an important source of under for development. The surplus of government enterprises could be re-invested in the same industries or used for the establishment and expansion of other industries. It may note that private sector industries can also plough back whole or substantial amounts of their profits for expansion. However, profits in private enterprises are declared as dividends among shareholders. This would only create inequalities among people. But profits of public sector industries can be directly used for capital formation.

v. Socialistic Pattern of Society: The socialistic pattern of society calls for one thing, production will have to be centrally planned as regards the type of goods to be produced, the volume of output and the timing of their production. It may be comparatively easy to achieve this through the public sector rather than through private sector. We may quote the second five -year plan here: “The adoption of the socialistic pattern of society as the national objective, as well as the need for planned and rapid development require that all industries of basic and strategic importance, or in the nature of public utility services should be in the public sector. Other industries which are essential and require investment on a scale which only the state, in present circumstances, could provide, have also to be in the public sector.4

Beside, one of the objectives of the Directive Principles of the Indian Constitution is to bring about reduction of the inequalities of income and wealth and to establish an egalitarian society. The Five – Year Plans have taken this up as a major objective of planning. The public enterprises were used as major instruments for the reduction of inequalities of income and to
bring about a more equitable distribution of income in several ways: (a) The profits of public enterprises would go to the government unlike those of private enterprises which go to the enrich private pockets. (b) There could be effective regulation of income of top executives in public enterprises taking of course steps to maintain high managerial efficiency. (c) The public enterprises could be asked to adopt discriminatory price policies which would benefit the low-income consumers; and (d) they, generally make it easy to raise wage income of the low-paid staff.

Explaining the importance of the public sector in a mixed economy an its role in the establishment of a socialist pattern of society, Professor V.K.R.V. Rao opined, "sector of economic activity which involve either monopoly conditions of strategic economic power or possession of large resources in private hands should be publicly owned and operated as public enterprises. It also means that public enterprise should make itself responsible for the building of the economic overheads on the external economies like transport, power, fuel and basic capital goods without which increase in the production of consumption goods and services either on the required scale of necessary economic basis will not be possible, irrespective of whether it is to be in the private of public sector. It also means that the extension of the public sector, in economic enterprise will be followed by a substantial growth in the volume of national saving and investment as well as the funds available for government outlay on social services...without public enterprise, there can be no private enterprise. In fact, it is the former that enables the full growth of the latter."\(^5\)

vi. **Limitations and Abuses of the Private Sector:** The behavior and attitude of the private sector itself was an important factor responsible for the expansion of the public sector in the country. When the Americans insisted on the Bokaro Project to be set up in the private sector, Mr. J.R.D. Tata openly confessed that the private sector was not in a position to mobilize resources to the tune of Rs.
700 crores. Thus, the private sector did not want to move into certain sectors or if it wanted to move in, it did not have the necessary resources. This was understandable but the private sector was unwilling to take even the normal risks of business. During the second plan period and later, many of the licenses issued to the private sector for setting up fertilizer units were surrendered when the need for fertilizer production was paramount for the country to push an agricultural breakthrough. To give another example, the business recession of 1966-67 frightened the private sector cement industry from expansion even though it had given an undertaking to the Government to expand. To safeguard the long-term prospects of the economy, the Government had to set up the Cement Corporation of India to boost the production of cement. The failure of the private sector drug industry to manufacture antibiotics and at the same, its tremendous exploitation of the consumers to the extent of holding them to ransom was responsible for the entry of the Government in drugs and pharmaceuticals industry.

In a number of cases, the Government was forced to take over a private sector industry or industrial units either in the interest of workers or to prevent excessive exploitation of consumers. The private sector life insurance companies were taken over by the government to protect the interest of the insured from the shortsighted and rapacious private exploiters. The top 20 commercial banks were nationalized, among other things, to prevent bank funds being used for building up private industrial and commercial empires. The takeover of sick cotton mills was due to the failure of the private sector. The point to note here is that often the private sector did not function as it should and did not carry out its social responsibilities. Accordingly, the Government was forced to takeover or nationalize the private sector units.
To sum up, the expansion of the public sector was aimed at the fulfillment of our national goals, viz. the removal of poverty, the attainment of self-reliance, reduction in inequalities of income, expansion of employment opportunities, removal of regional imbalances, acceleration of the pace of agricultural and industrial development, to reduce concentration of ownership and prevent growth of monopolistic tendencies by acting as effective countervailing power to the private sector, to make the country self-reliant in modern technology an create professional, technological and managerial cadres so as to ultimately rid the country from dependence on foreign aid.

7. Growth of the private sector vis-à-vis the public sector: At the time of independence, almost the entire production and trade were in the hands of the private sector and the public sector was insignificant, being confined to irrigation, power, railways, ports, posts and telegraphs and ordnance establishments. After 1951, the public sector was expanded fast both by the Center and the States and it has become significant in many fields in terms of investment, total turnover, capital formation, contribution to export effort, import substitution etc. Even then, the private sector has continued to be dominant in all spheres, accounting for 80 percent of the gross domestic product and over 90 percent of the total employment.
Table 68. Growth of the private corporate sector in India

<table>
<thead>
<tr>
<th></th>
<th>1957</th>
<th>1971</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Companies</td>
<td>29,357</td>
<td>30,322</td>
<td>5,42,308</td>
</tr>
<tr>
<td>(a) Government</td>
<td>74</td>
<td>314</td>
<td>1,257</td>
</tr>
<tr>
<td>(b) Non-Government</td>
<td>29,283</td>
<td>30,008</td>
<td>541,051</td>
</tr>
</tbody>
</table>

Paid-up capital (Rs. Crores)

<table>
<thead>
<tr>
<th></th>
<th>1957</th>
<th>1971</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>All companies</td>
<td>1,080</td>
<td>4,500</td>
<td>267,898</td>
</tr>
<tr>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
<td>(100.0)</td>
</tr>
<tr>
<td>Government</td>
<td>70</td>
<td>2,060</td>
<td>95,842</td>
</tr>
<tr>
<td>Companies</td>
<td>(6.8)</td>
<td>(45.8)</td>
<td>(35.8)</td>
</tr>
<tr>
<td>Non-government</td>
<td>1,010</td>
<td>2,440</td>
<td>1,72,056</td>
</tr>
<tr>
<td>Companies</td>
<td>(93.2)</td>
<td>(54.2)</td>
<td>(64.2)</td>
</tr>
</tbody>
</table>

Note: Figures in brackets are percentage of total paid-up capital.


As the private sector is generally equated with the private corporate sector in narrow sense, it is convenient and useful to study the growth of the private corporate sector and compare it with the growth of the public sector.

Table 68 brings out clearly the growth of the corporate sector in India over the last four decades. The public sector companies occupy an important in terms of the amount of paid-up capital, even though the number of government companies is so small. Even in terms of number of
companies the rate of growth of public companies. Has been faster than that of the private sector companies. Between 1957 and 2000, the number of government companies had increased from 74 to 1,257. On the other hand, during the same period, the number of non-government companies had increased from 29,283 to 541,051.

The paid-up capital of government companies increased from Rs. 70 crores in 1957 to Rs. 95,842 crores by March 2000. During the same period, the paid-up capital of private sector companies increased from Rs. 1,010 crores to Rs. 172,056 crores. The share of Government companies in total paid-up capital of all companies rose from 6.8% in 1957 to 35.85% in 2000. This indicates the growing importance of government companies.

8. THE GOVERNMENT AND THE PRIVATE SECTOR: In the planning era, the government of India has set up a network of development banking and financial institutions to finance and support the private sector. In this category we can mention the NABARD, the Industrial Finance Corporation of India (IFCI), the state Financial Corporations, the Industrial Credit and investment Corporation of India (ICICI), the Industrial Development Bank of India (IDBI), the EXIM Bank, etc. The government has also set up a whole range of institutions to assist in the provision of infrastructure, raw material supply, and marketing, technology development, etc. these institutions have stimulated development of new industrial activities, new centers of industry, and new entrepreneurs. In fact, it has been the contention of the government that the expansion and prosperity of the private sector have been essentially due to the active support and encouragement provided by the Government.

A part from the support structure, the Government has also set up a vast control and regulatory structure. The government expects the private
sector to work within the framework specified for it in a planned mixed economy, and not simply to be guided by the profit motive.

Despite intentions and pronouncements to the contrary, the government's support structure to the private sector was over-shadowed by its regulatory and control structure of the private sector. All legislations on the corporate sector contained only restrictions and regulations. Even the Industries (Development and Regulation) Act 1951, which was originally meant to develop industries eventually, became a restrictive instrument. A part from legislative restrictions and constraints, a series of price controls, monetary and fiscal controls were added. All these steps clearly showed the lack of trust and understanding between the Government and the private corporate sector. This has been a major contributory factor to the slowing down of the growth rate in industry.

In recent years, the Government has shown greater awareness regarding the need for adapting and modifying both the support structure and the regulatory framework to suit the fast changing needs of a diversified industrial economy. The Government has given up its rigid stand in favour of the dominant role of the public sector. Accordingly, the Government has liberalized considerably the control-regulatory apparatus under which the private sector has been functioning for so long. After the announcement of Industrial Policy of 1991, the Government has systematically abolished licensing in all industries (except a small list of 15 industries) and is simplifying procedures and controls to release the private sector from unnecessary bureaucratic shackles. The Government has abolished the restrictions paced on big business houses under MRTP Act.

9. COMPARISION ON THE PUBLIC AND PRIVATE SECTOR

Before undertaking a comparision of the public sector and the private sector, it would be relevant when to state that there is a considerable amount of misinformation about the role of public sector. After the wave of dismantling of the public sector in U K in the late 1970's, their have
developed certain preconceived notions about the public and private sectors. Dr. S. R. Mohnot rightly mentions: “The efficiency of the enterprises in the private sector is taken for granted. Conversely, the substandard performance of the public enterprises is an unquestioned hypothesis. The make believes go unchallenged”. It is therefore, vitally necessary to examine empirical evidence about the performance both these sectors so that the conclusions are arrived on the basis of facts rather than on preconceived notions. The relevant facts are as under:

Aggregate net profit after tax earned by all central public enterprises in the 1999-2000 was Rs.14,555 crores which accounted for 17.5% of equity capital, the base investment, a major part of which was provided by the national exchequer. During 1998-99, this ratio was 17% and in 1997-98, it was higher at 18.9%. This underlines the fact that this return on public enterprises was fairly good.

It may be noted that net profit of all CPEs in 1999-00 was Rs. 14,555 crores as against only Rs.2,272 crores in 1990-91. This implies a steady growth of net profit— an index of efficiency. This profit includes the losses of loss-making CPEs. It also includes the non-commercial 25 companies. Despite these factors, the profits of CPEs are, judged by the standard of performance, quite healthy.

**PROFITABILITY BASED COMPARATIVE PERFORMANCE**

Dr. S. R. Mohnot on the basis of CMIE data has analyzed the performance of public sector and the private sector enterprises. Taken the two leading parameters, namely, net profit to turnover ratio and net profit to net worth ratio, the following picture emerges:

On the basis of net profit to turnover ratio, it may be noted that the public sector did not perform well during 1994-95 and 1995-96, but
improved its position significantly during 1996-97 and 1997-98. If we exclude the taken over private enterprises, than during 1997-98, the NP turnover ratio of the public sector was 4.7 while that of Indian business houses was nearly 2.3% and the same percentage was observed for the total Indian private sector. Obviously, the record of the public sector enterprises on the basis of this criterion indicated better performance of this sector than that of private sector (refer to table)

Table 69: Net profit to Turn over ratio

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Private sector</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Indian Business houses</td>
<td>6.1</td>
<td>6.3</td>
<td>3.5</td>
<td>2.3</td>
</tr>
<tr>
<td>-Total Indian Private sector</td>
<td>6.1</td>
<td>6.0</td>
<td>3.2</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>The Central Public Sector</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Basic Public Sector</td>
<td>4.3</td>
<td>3.7</td>
<td>3.8</td>
<td>4.7</td>
</tr>
<tr>
<td>Taken over sick private enterprises</td>
<td>-27.3</td>
<td>-26.0</td>
<td>-34.6</td>
<td>-45.4</td>
</tr>
</tbody>
</table>

Source: Center for industrial and economic research, Performance of Public and Private sector, p.21.

On the basis of other equally powerful parameter of net profit to net worth ratio which measure the return on investment and real shareholder value, the position was as follows:
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Private sector</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Indian Business houses</td>
<td>15.0</td>
<td>14.0</td>
<td>7.4</td>
<td>5.2</td>
</tr>
<tr>
<td>-Total Indian Private sector</td>
<td>15.2</td>
<td>13.3</td>
<td>6.5</td>
<td>4.7</td>
</tr>
<tr>
<td><strong>The Central Public Sector</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Basic Public Sector</td>
<td>7.4</td>
<td>8.2</td>
<td>5.0</td>
<td>5.4</td>
</tr>
<tr>
<td>Taken over sick private enterprises</td>
<td>Negative net worth not amenable to computation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Center for industrial and economic research, Performance of Public and Private sector, p.21.

On the basis of this criterion as well, the public sector did not fare well during 1994-95 and 1995-96, in 1997-98, it fared better than the Indian business houses as well as the total Indian private sector. (Refer table 70)

Both the parameters reveal that the public sector was improving its position and its major problem was the takeover sick private enterprises thrust on it.

**OTHER FINANCIAL PARAMETERS**

Center for Industrial & Economic Research (CIER) undertook an analysis of 2,436 companies relating to dividends declared by public and private sector companies during 1998-99. The analysis revealed that “some 1452 companies or about 80% private companies did not declare any dividend during 98-99. The comparative shares of nondividend declaring companies in the two sectors were: PSUs 24%, private sector 60%. Nearly
62% of public sectors companies in the tally had declared dividends exceeding 10%; in the case of the private sectors companies, only 36% had declared dividends exceeding 10%.

Another factual distortion about the public sector performance relates to the savings by the public sector. The negative shown against the public sector is only due to government administration. Disaggregated from government administration, the total public sector including departmental and non departmental both shows positive numbers – which compare favorable with the private corporate sector. The contribution of the public sector in 1998-99 was 4.5% and of the private corporate sector 4.2%. Going 5 years back that is 1993-94, it was 4.0 % for the public sector and 3.8 % for the private corporate sector, still higher for the public sector.

**TABLE 71: DIVIDENDS PERFORMANCES OF COMPANIES**

<table>
<thead>
<tr>
<th>No dividend declared</th>
<th>Less than 10%</th>
<th>10% and above</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private sector (no.)</td>
<td>1,438</td>
<td>93</td>
<td>837</td>
</tr>
<tr>
<td>%</td>
<td>60.5</td>
<td>3.9</td>
<td>35.6</td>
</tr>
<tr>
<td>Public sector (no.)</td>
<td>14</td>
<td>8</td>
<td>36</td>
</tr>
<tr>
<td>%</td>
<td>24.1</td>
<td>13.8</td>
<td>62.1</td>
</tr>
</tbody>
</table>

1. Introduction:

Established in the late 50's, Bharat Heavy Electricals Limited (BHEL) is, today, a name to reckon with in the industrial world. It is the largest engineering and manufacturing enterprise of its kind in India and one of the leading international companies in the power field. BHEL offers over 180 products and provides systems and services to meet the needs of core sectors like: power, transmission, industry, transportation, oil & gas, non-conventional energy sources and telecommunication. A wide-spread network comprising 14 manufacturing divisions, 8 service centers, 4 power sector regional centers, 18 regional offices, besides a large number of project sites spread all over India and abroad, enables BHEL to be close to its customers and cater to their specialised needs with total solutions efficiently and economically. An ISO 9000 certification has given the company international recognition for its commitment towards quality. With an export presence in more than 60 countries, BHEL is truly India's industrial ambassador to the world.

BHEL has joined the "Global Compact" of United Nations and has committed itself to support it and the set of core values enshrined in its ten principles. The "Global Compact" is a partnership between the United Nations, the business community, international labour and NGOs. It provides a forum for them to work together and improve corporate practices through co-operation rather than confrontation.
BHEL's contributions towards Corporate Social Responsibility till date include adoption of villages, free medical camps/charitable dispensaries, schools for the underprivileged and handicapped children, ban on child labour, disaster/natural calamity aid, Employment for handicapped, Widow resettlement, Employment for Ex-serviceman, irrigation using treated sewage, pollution checking camps, plantation of millions of trees, energy saving and conservation of natural resources through environmental management.

BHEL shares the growing concern on issues related to Environment and Occupational Health & Safety (OHS), and is committed to protecting Environment in and around its own establishment, and to providing safe and healthy environment to all its employees. For fulfilling these obligations, a Health, Safety & Environmental Policy has been formulated and implemented through management systems.

In recognition of this, BHEL has been awarded the ISO 14001 Environmental Management Systems Certification and OHSAS 18001 Occupational Health & Safety Management Systems Certification from M/s Det Norske Veritas (DNV). Under UNDP programme for specialized services in the area of Environment, BHEL has set up a Pollution Control Research Institute (PCRI). BHEL also has a Model Centre for Occupational Health Services at Trichy, which is a pioneer in this field in India. Today it offers a wide range of occupational health care as well as expertise in work Environment monitoring, Toxicology, Ergonomics and in organization of OHS to multitude of industries for different sectors in India. Few ILO sponsored candidates from African countries have undergone training at this Model center.
BHEL is a member of CoRE (*Corporate Roundtable on Development of Strategies for Environment*) launched by The Energy Research Institute (TERI). CoRE is envisaged as a means to facilitate a proactive and catalytic role for industry in addressing the environmental problems plaguing India and helping the industry towards sustainability paradigm. CoRE is now a partner organization to the WBCSD (World Business Council for Sustainable Development). It has signed a memorandum of understanding with WBCSD, now called as CoRE-BCSD, India. Interfaces between companies such as BHEL, TERI and the WBCSD would provide an important link to address issues of sustainable development at a global level and to learn and exchange experience of the participating companies.

BHEL’s commitment to environmental issues can be seen as an integral part of its core business. In the field of Non-conventional and Renewable Energy, BHEL has successfully launched products like wind electric generators, solar heating systems, solar photovoltaic systems, solar lanterns and battery powered road vehicles. Technology upgradation has been done to minimize environmental impact of fossil energy products, by way of low-NOx oil/ gas burners, circulating fluidised bed combustion boilers etc.

### 2. Health, Safety & Environmental Policy

*Occupational Health and Safety Policy*

- Compliance with applicable Legislation and Regulations.

- Setting objectives and targets to eliminate / minimize / control risks due to Occupational and Safety Hazards.
• Appropriate structured training of employees on Occupational Health and Safety (OH&S) aspects.

• Formulation and maintenance of OH&S Management programmers for continual improvement.

• Periodic review of OH&S Management System to ensure its continuing suitability, adequacy and effectiveness.

• Communication of OH&S Policy to employees and interested parties.

In pursuit of these Policy requirements, BHEL will continuously strive to improve work practices in the light of advances made in technology and new understandings in Occupational Health, Safety and Environment Science.

Environmental Policy

To strive to be an environmental friendly company in its Activities, Products and Services through:

• Compliance with applicable Environment Legislation / Regulation.

• Continual Improvement in Environment Management System to protect our natural environment and Control pollution

• Promotion of activities for conservation of resources by Environment management

• Enhancement of environment activities, offering the company’s capabilities in this field.

• Assist and co-operate with concerned Government agencies / Regulatory bodies engaged in environmental activities, offering BHEL’s capabilities in this field.
3. PRODUCT RANGE

This list is intended as a general guide and does not represent all of BHEL's products and systems.

**THERMAL POWER PLANTS**

Steam turbines and generators of up to 500 MW capacity for utility and combined-cycle applications; capability to manufacture steam turbines with super critical steam cycle parameters and matching generator up to 1000 MW unit size.

Steam turbines for CPP applications; capability to manufacture condensing, extraction, back pressure, injection or any combination of these types.

**GAS BASED POWER PLANTS**
Gas turbines of up to 255 MW (ISO) rating.
Gas turbine based co-generation and combined-cycle systems for industry and utility applications.

**HYDRO POWER PLANTS**
Custom-built conventional hydro turbines of Kaplan, Francis and Pelton types with matching generators, pump turbines with matching motor-generators.
Mini/micro hydro sets.
Spherical, butterfly and rotary valves and auxiliaries for hydro station
DG POWER PLANTS DG POWER PLANTS

HSD, LDO, FO, LSHS, natural-gas/biogas based diesel power plants, unit rating up to 20MW and voltage up to 11kV, for emergency, peaking as well as base load operations on turnkey basis.

INDUSTRIAL SETS

Industrial turbo-sets of ratings from 1.5 to 120MW

Gas turbines land matching generators ranging from 3 to 255MW (ISO) rating.

Industrial stream turbines and gas turbines for drive applications and cogeneration applications

BOILERS

Steam generators for utilities, ranging from 30 to 500MW capacity, using coal, lignite, oil, natural gas or a combination of these fuels; capability to manufacture boilers with super critical parameters up to 1000 MW unit size.

Steam generators for industrial applications, ranging from 40 to 450t/hour capacity using coal, natural gas, industrial gases, biomass, lignite, oil, bagasse or a combination of these fuels.

Pulverized fuel fired boilers.

Stoker boilers.

Atmospheric fluidized bed combustion boilers.

Circulating fluidized bed combustion boilers.

Waste heat recovery boilers.
Chemical recovery boilers for paper industry, ranging from capacity of 100 to 1000 t/day of dry solids.
Pressure vessels.

**BOILER AUXILIARIES**

*Fan*

Axial reaction fans of single stage and double stage for clean air application, with capacity ranging from 25 to 800m3/s and pressure ranging from 120 to 1,480 m of gas column.

Axial impulse fans for both clean air and flue gas applications, with capacity ranging from 7 to 600m3/s and pressure up to 700 m of gas column.

Single and double-suction radial fans for clean air and dust-laden hot gases applications up to 400°C, with capacity ranging from 4 to 600m3/s and pressure ranging from 150 to 1,800 m of gas column.

*Air-Pre-heaters*

Ljungstrom rotary regenerative air-pre-heaters for boiler and process furnaces

Large regenerative air-preheaters for utilities of capacity up to 1000 MW

*Gravimetric Feeders*

*Pulverizes*

Bowl mills of slow and medium speed of capacity up to 100 t/hour.

Tube mills for pulverizing low-grade coal with high-ash content.
Pulse Jet and Reverse Air Type Fabric Filters (Bag Filters)

Electrostatic Precipitators

Electrostatic precipitators of any capacity with efficiency up to 99.9% for utility and industrial applications.

Mechanical Separators

Soot Blowers

Long retractable soot blowers (travel up to 12.2m), wall deslaggers, rotary blowers and temperature probes and related control panels operating on pneumatic, electric or manual mode.

Swivel arm type soot blowers for regenerative air-preheaters.

HEAT EXCHANGERS AND PRESSURE VESSELS

CS/AS/SS/Nonferrous shell and tube heat exchangers and pressure vessels.
Air-cooled heat exchangers.

PUMPS

Standby oil pumps

Surface condensers.

Steam jet air ejectors.

Columns.

Reactors, drums.

LPG/propane storage bullets.

LPG/propane store mounded vessels.

Feed water heaters.

POWER STATION CONTROL EQUIPMENT
Microprocessor-based distributed digital control systems.
Data acquisition systems.
Man-machine interface.
Sub-station controls with SCADA.
Static excitation equipment/automatic voltage regulator.
Electro-hydraulic governor control.
Turbine supervisory system and control.
Furnace safeguard supervisory systems.
Controls for electrostatic precipitators.
Controls for HP/LP bypass valves.

**SWITCHGEARS**

Switchgear of the various types for indoor and outdoor applications and voltage ratings up to 400 kV.
Minimum oil circuit breakers (66K – 132kV).
SF6 circuit breakers (132 kV – 400 kV).
Vacuum circuit breakers (3.3 kV – 33 kV).
Gas insulated switchgears (36 kV).

**BUS DUCTS**

Bus-ducts with associated equipment to suit generator power output of utilities of up to 500 MW capacity.

**TRANSFORMERS**

Power transformers for voltage up to 400 kV.

HVDC transformers and reactors up to + 500 kV rating.

Series and shunt reactors of up to 400 kV rating.

Instrument transformers:
Current transformers up to 400 kV.
Electro-magnetic voltage transformers up to 220 kV.
Capacitor voltage transformers up to 400 kV.
Cast resin dry type transformers up to 10 MVA 33 kV.
Special transformers: earthing; furnace; rectifier; electrostatic precipitator;
freight loco and ACEMU and traction transformers

INSULATORS

High-tension ceramic insulators.

Disc/suspension insulators for AC/DC applications, ranging from 45 to 300 kV electro-mechanical strength, for clean and pollute atmospheres.
Pin insulators of up to 33 kV.
Post insulators suitable for applications of up to 6 units.
Hollow porcelains of up to 400 kV.
Solid core insulators of 25 kV rating (both porcelain and hybrid) for railways.
Disc insulators for 800 kV AC and HVDC transmission lines (BHEL is the first Indian manufacturer to supply such insulators).

CAPACITORS

Power capacitors for industrial and power systems of up to 250 kVAr rating for application up to 400 kV.
Coupling/CVT capacitors for voltages up to 400 kV.
Low Tension Thyristor Switched Capacitors (LTTSC) for dynamic power factor correction

ENERGY METERS

Single Phase, Poly Phase and Special-purpose electro-mechanical and electrical meters
AC squirrel cage, slipring, synchronous motors, industrial alternators and DC machines are manufactured as per range summarized below. Special-purpose machines are manufactured on request.

**AC Machines for Safe Area Application**

- **Induction Motors**
  - Squirrel cage: 150 to 35000 kW
  - Synchronous motors: 200 to 15000 kW
  - Variable-Frequency drives: 500 to 17500 kW
  - Synchronous motors: 1000 to 17500 kW
  - Induction motors: 200 to 35000 kW

**AC Machines for Hazardous Area Application**

- Flame-proof motors (Ex. 'D'): 150 to 1600 kW
- Pressurised (Ex 'P'): 150 kW and above
- Non-sparking (Ex. 'N'): Variable Speed
- Non-sparking (Ex. 'N')
- Increased safety (Ex 'E'): Synchronous and Squirrel Cage

**DC Machines**

- Mill Duty: 3.5 to 186 kW
- Medium/Large: 100 to 12000 kW

**Industrial Alternators**

Steam turbine, gas turbine and diesel engine driven from 2000 kVA to 60,000 kVA.

**Voltage & Enclosure**

- **Voltage**: AC - 415 V to 13800 V
- **Enclosure**: SPDP, CACW, CACA
COMPRESSORS

Centrifugal compressors of varying sizes, driven by steam turbine/gas turbine/motor, for industrial applications handling almost all types of gases; range covers pressure up to 800 kg/cm2 and capacity up to 350,000 Nm3/hour.

CONTROL GEAR

Industrial Control gear

Control panels and cubicles for applications in steel, aluminum, cement, paper, rubber, mining, sugar and petrochemical industries.

Liquid rotor starters for slipring induction motors of up to 2500 hp rating.

Liquid regulators for variable-speed motors.

Contractors

LT air break type AC for voltages up to 660 V.
LT air break type DC contactors for voltages up to 600 V.
HT vacuum type AC for voltages up to 11 kV.

Traction Control gear

Control gear equipment for railways and other traction applications.

Control and Relay Panels

Control panels for voltages up to 400 kV and control desks for generating stations and EHV sub-stations.

Control and relay boards.

Turbine gauge boards for thermal, gas, hydro and nuclear sets.

Turbine electrical control cubicles.

Outdoor-type control panels and marshalling kiosks, swinging type synchronizing panel and mobile synchronizing trolley.

Transformer tap changer panels.
**SILICON RECTIFIERS**

Silicon power rectifiers with matching transformers for industrial applications like aluminum/copper/zinc smelting, for electrolysis in chemical industry and AC/DC traction application.

**THYRISTOR EQUIPMENT**

Thyristor converter equipment.
Thyristor inverter equipment.
Static AC variable-speed drive systems.
Thyristor valves for HVDC transmission up to 500 kV.

**POWER DEVICES**

High power capacity silicon diodes, thyristor power devices and solar photovoltaic cells.

**TRANSPORTATION EQUIPMENT**

AC Electric locomotive
AC-DC Dual Voltage Electric locomotive.
Diesel-Electric Shunting locomotive
Diesel Hydraulic Shunting locomotive
OHE Recording cum Test Car.
Electric Traction Equipment (for diesel/electric locos electric multiple units, diesel multiple units and urban transportation systems).
Traction motors.
Transformers smoothing reactors.
Traction generators/alternators.
Rectifiers.
Bogies.
Vacuum circuit breakers.
Auxiliary machines.
Microprocessor-based electronic control equipment.
Power converter/inverter.
Static inverter for auxiliary supply.
Loco control resistances i.e. field diveters, dynamic braking resisters and inductive shunts.

**OIL FIELD EQUIPMENT**

Oil Rigs: A variety of on-shore rigs, work-over rigs, mobile rigs, heli-rigs, desert rigs for drilling up to depths of 9,000 m, completer with matching draw-works and hoisting equipment including: Mast and substructure; Rotating equipment; Mud system including pumps; Power packs and rig electrics; Rig instrumentation; Rig utilities and accessories.

Well Heads and Christmas Trees/Sub Sea Equipment

Well Head and X-Mas Trees for working pressures up to 10,000 psi.

Choke and kill manifolds.

Mud valves.

Full bore valves.

Block valves.

Mudline suspension system.

Casing support system.

Sub sea Well Heads.

**CASTINGS AND FORGINGS**

Sophisticated heavy castings and forgings of creep-resistant alloy steels, stainless steel and other grades of alloy steels meeting stringent international specifications.

**SEAMLESS STEEL TUBES**

Hot-finished and cold-drawn seamless steel tubes with a range varying from outer diameter of 19 to 133 mm and wall thickness of 2 to 12.5 mm,
in carbon steel and low-alloy steels to suit ASTM/API and other international specifications.

Studded tubes: Extended surface tubes for high performance heat transfer applications

Spiral finned tubes: High frequency resistance welded finned tubes for WHR systems, economizers and heat furnaces.

NON-CONVENTIONAL ENERGY SYSTEMS
Wind electric generator of up to 250 kW rating.
Solar PV systems and power plant.
Solar water heating systems.
Solar lanterns.
Battery-powered road vehicle

TELECOMMUNICATION
Switching equipments - RAX, MAX-L, MAX-XL.

SYSTEMS AND SERVICES
### BHEL at a Glance Financially

<table>
<thead>
<tr>
<th>Rupees (million)</th>
<th>2002-03</th>
<th>2003-04</th>
<th>CHANGE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnover</td>
<td>74822</td>
<td>86625</td>
<td>15.77</td>
</tr>
<tr>
<td>Value Added</td>
<td>32475</td>
<td>36800</td>
<td>13.32</td>
</tr>
<tr>
<td>Employee (Nos.)</td>
<td>46855</td>
<td>43952</td>
<td>-6.20</td>
</tr>
<tr>
<td>Profit Before Tax</td>
<td>8024</td>
<td>10148</td>
<td>26.47</td>
</tr>
<tr>
<td>Profit After Tax</td>
<td>4445</td>
<td>6582</td>
<td>48.08</td>
</tr>
<tr>
<td>Dividend</td>
<td>979</td>
<td>1469</td>
<td>50.05</td>
</tr>
<tr>
<td>Dividend Tax</td>
<td>125</td>
<td>190</td>
<td>52.00</td>
</tr>
<tr>
<td>Retained Earnings</td>
<td>3341</td>
<td>4923</td>
<td>47.35</td>
</tr>
<tr>
<td>Total Assets</td>
<td>95879</td>
<td>116564</td>
<td>21.57</td>
</tr>
<tr>
<td>Net Worth</td>
<td>47082</td>
<td>52781</td>
<td>12.10</td>
</tr>
<tr>
<td>Total Borrowings</td>
<td>5310</td>
<td>5400</td>
<td>1.69</td>
</tr>
<tr>
<td>Debt : Equity</td>
<td>0.11</td>
<td>0.10</td>
<td>-9.29</td>
</tr>
<tr>
<td>Per Share (in Rupees) :</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Net worth</td>
<td>192.36</td>
<td>215.64</td>
<td>12.10</td>
</tr>
<tr>
<td></td>
<td>18.16</td>
<td>26.89</td>
<td>48.06</td>
</tr>
<tr>
<td>------------------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td><strong>Earnings</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dividend</strong></td>
<td>4.00</td>
<td>6.00</td>
<td>50.00</td>
</tr>
</tbody>
</table>

(US $ in million)

<table>
<thead>
<tr>
<th></th>
<th>1581</th>
<th>1976</th>
<th>25.05</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Turnover</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Profit Before Tax</strong></td>
<td>169</td>
<td>232</td>
<td>36.60</td>
</tr>
<tr>
<td><strong>Profit After Tax</strong></td>
<td>94</td>
<td>150</td>
<td>59.93</td>
</tr>
</tbody>
</table>

Conversion Rates (Rates as on March 31):
1 US $ = Rs.47.34 for 2002-03
1 US $ = Rs.43.83 for 2003-04
5. BHEL's expected performance during 2005-06

BHEL’s expected performance during 2005-06

A Memorandum of Understanding (MOU) for the year 2005-06 was signed between CMD/BHEL and the Secretary (Heavy Industries & Public Enterprises), Government of India, on 30th March 2005, with the following financial parameters & targets:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Turnover (Rs. Millions)</td>
<td>110,000</td>
</tr>
<tr>
<td>Gross Margin (Rs. Millions)</td>
<td>16,620</td>
</tr>
<tr>
<td>PBDIT to Total Employment (Rs. Millions)</td>
<td>0.387</td>
</tr>
<tr>
<td>Gross Margin to Gross Block (%)</td>
<td>40.96</td>
</tr>
<tr>
<td>Gross Profit to Capital Employed (at year end) (%)</td>
<td>24.99</td>
</tr>
<tr>
<td>Net Profit to Net Worth (at year end) (%)</td>
<td>12.84</td>
</tr>
<tr>
<td>Added Value to Gross Sales (%)</td>
<td>10.04</td>
</tr>
</tbody>
</table>

In addition, a number of dynamic and sector specific criteria covering areas such as ISO certification, achievement of TQM score, human resource development, engineering and research & development including technology development projects, project implementation (modernization/expansion), capital expenditure for schemes, globalization through enhanced overseas marketing efforts, supply completion for major projects and corporate governance have been identified with specific target for each of them to be achieved during the year.
6. Board of Directors

Board of Directors (As on 01.09.2005)

CHAIRMAN & MANAGING DIRECTOR

AK Puri
Chairman & Managing

NOMINEE OF GOVERNMENT OF INDIA

Naresh Chaturvedi Dr. Surajit Mitra
Additional Secretary & Joint Secretary

INDEPENDENT & NON-EXECUTIVE DIRECTORS

Vineet Nayyar
Director

WHOLE-TIME FUNCTIONAL DIRECTORS

SK Jain Ramji Rai
Director (HR) Director (ER&D)
AK Mathur K Ravi Kumar
Director (IS&P) Director (Power)
CS Verma
Director (Finance)

COMPANY SECRETARY

NK Sinha
Company Secretary

Board of Directors

WHOLE TIME FUNCTIONAL DIRECTORS

Shri Santosh Kumar Jain, aged 57 years, is a Mechanical Engineering Graduate (1969) from Raipur Engineering College. Shri Jain joined BHEL in 1970. During his over three decades of association with BHEL, he has brought about several major changes in technical as well as managerial areas, leading to significant value addition.

During his stints at BHEL's Bhopal and Jhansi plants, Shri Jain spearheaded major breakthroughs and improvements in the areas of Traction Commercial, Insulation Division, Electrical Machines Division and Transformer Division, through his professional approach and administrative skills.

Prior to his appointment as Director (Human Resources) in March 2004, Shri Jain was heading BHEL-Hardwar Unit. He is a pioneer in evolving new 'Business Policy' and identifying 'Critical Success Factors' through Annual Top Management Workshops. A keen observer of Quality in all walks of life, he propounded the unique method of 'Quality through Measurement' which earned him the coveted BHEL 'Excel'
award.

In addition, Shri Jain introduced many creative initiatives like Root Cause Analysis, Critical to Quality, 'Grahak Safal -Hum Safal', MoU with Vendors, Auto-Indenting and B2B portal etc. Under his stewardship, the Hardwar Unit was awarded CII's 'Commendation Award for Strong Commitment to TQM', in November 2003.

As a crusader for Total Quality movement, Shri Jain is associated with many leading organisations. He is also a member of the Technical Committee for the CII Exim Bank Award.

Shri Chinnasamy Iyengar Srinivasan, aged 59 years, is a Fellow member of the Institute of Cost & Works Accountants of India (FICWA). Prior to joining Board of BHEL as Director (Finance) w.e.f. March 2001, Shri Srinivasan was the Chief Financial Controller of Indian Petrochemicals Corporation Limited (IPCL). Earlier, Shri Srinivasan held the position of Management/Chief Accountant of Zambia Steel & Building Supplies Limited, Lusaka for 5 years.

Shri Srinivasan has a wide experience in the area of Corporate Finance, and has successfully managed the debt portfolio of IPCL. During his tenure at IPCL, he was instrumental in mobilising large foreign currency loans from the World Bank and the Exim Banks of Japan & USA. IPCL also emerged as the first Indian PSE to successfully complete a GDR issue in the overseas market, under his stewardship.

Shri Srinivasan was also a Director on the Board of GE Plastics (India) Limited, a Joint-Venture Company of IPCL and GE, set up for
manufacturing engineering plastics material.

Shri Ramji Rai, aged 58 years, is a Mechanical Engineering Graduate from Banaras Hindu University.

Shri Ramji Rai joined BHEL in 1969 and played a pivotal role in various fields viz. Planning, Project Management, Manufacturing Technology and various other disciplines within BHEL. A specialist in Electrical Machines, he made significant contribution in the area of rotating electrical machines. He was also primarily responsible for absorption and assimilation of Siemens advance technology for manufacture of 210MW, 250MW and 500MW sets.

Prior to his appointment as Director (Engineering, Research & Development) in February 2004, Shri Rai was Executive Director heading BHEL's Electronics Division at Bangalore.

Under Shri Rai's stewardship, BHEL's Electronics Division was accredited with the prestigious ISO-14001 and OHSAS-18001 certifications, and as Head of BHEL's Power Sector-Eastern Region, many landmarks were achieved including the successful execution and commissioning of 2-cylinder 120MW steam turbine set for the first time in the country.

Shri Rai has widely travelled abroad, to countries like USA, France, Germany, Netherlands and Brazil, for business promotion.
Shri Ashok Kumar Puri, aged 56 years, is an Electrical Engineer and MBA in Marketing & Finance from University of Delhi. Shri Puri joined BHEL in 1976 after a brief stint in the private sector.

In his 34 years of professional experience, Shri Puri has had diversified, versatile and hands-on experience through working in all major segments of the organization viz.

- Corporate Management
- All three Business Sectors of BHEL-Power, Industry & International Operations; and
- Operations in two manufacturing units of BHEL, namely, Electronics Division, Bangalore, and Electronics Systems Division, Bangalore.

As Head of Corporate Long Range Planning, Shri Puri was instrumental in guiding the development of Vision, Mission & Values for BHEL during 1996, resulting in "BHEL VISION 2001" and formulation of "Perspectives for 2002" - Corporate Plan of BHEL. Another notable achievement has been efforts put in the area of market research and techno-economic studies which had a vital role to play in the company's diversification and expansion plans. Notable amongst various diversified products taken up was Gas Turbine which today is one of the Growth Engine products of BHEL.

As Head of Manufacturing Units at Bangalore, Shri Puri brought in all-round improvement in all facets of operations especially achieving highest-ever Turnover and Cash inflow. He spearheaded introduction & assimilation of the-state-of-the-art technology for Controls & Instrumentation in record time as also Business Process Improvements
through focused Business Management System introduced in each business area.

As Head of International Operations Division, there was seven-fold increase in business in a short span of two years. BHEL made its mark with orders from Middle East for large-size gas turbine-based project. This was followed by orders for large-size Gas Turbine based projects, from Sri Lanka, Oman and Bangladesh. Order was also secured for hydro generator package from a new market viz., Azerbaijan, besides a number of businesses from other parts of the globe.

Prior to his appointment as Director (Power) in April 2004, Shri Puri was heading BHEL Power Sector-Marketing. He was instrumental in an all-time-high-order booking in 2003-04. Cumulative order booking in Power Sector in the 2 years of his tenure (2002-03 and 2003-04) exceeded aggregate of the preceding 5 years. Strategic initiatives taken by him in 2003-04 have resulted in BHEL retaining 100% market share in coal based power projects staving off stiff global competition particularly from China, Russia, Korea, Czech Republic, etc.

PART TIME OFFICIAL DIRECTORS

Shri Naresh Chaturvedi, aged 56 years, is an IAS Officer of 1970 batch from West Bengal cadre. Before joining as Additi'onal Secretary & Financial Advisor, Ministry of Heavy Industries & Public Enterprises, Govt. of India (in May 2003), he was Managing Director of Food Corporation of India. He also held several positions such as Excise Commissioner U.P., Secretary U.P. Uchhattar Siksha SevaAyog, Joint Secretary, School Education, Govt. of West Bengal, Excise Commissioner, West Bengal, Special Secretary, Home Department, Govt. of West Bengal, Secretary to Governor of West Bengal, Principal
Secretary, Fisheries Department, Govt. of West Bengal and Director General, Food & Ex-officio Principal Secretary, Food & Supplies Department, Govt. of West Bengal.

Shri Chaturvedi is a gold medalist in M. Sc. (Physics) and also a Law graduate. Shri Chaturvedi is also Director on the Boards of Bharat Bhari Udyog Nigam Limited, HMT Limited, Heavy Engineering Corporation, Andrew Yule Company Limited, DPSC Limited and Cement Corporation of India Limited.

Shri Dilip Raj Singh Chaudhary, aged 51 years, is an IAS Officer of 1977 batch. Before joining as Joint Secretary to the Govt. of India, Department of Heavy Industry, Ministry of Heavy Industries & Public Enterprises, Govt. of India, he worked in various capacities in the State Government of Madhya Pradesh, including as District Magistrate and Collector of Betul and Raipur districts in the erstwhile Madhya Pradesh. In the Govt. of India, he was posted to the Ministry of Steel and Mines as Deputy Secretary; he was also Director and later on Joint Secretary in the Department of Economic Affairs, Banking Division. On return to his cadre, he held the post of Registrar, Cooperative Societies. Later on, he was posted as Finance Secretary in the State Government for a period of four years. On promotion to the next level, he was posted as Commissioner, Housing Board and later was posted as Principal Secretary in the Finance Department.

Shri Chaudhary has completed his education from Campion School, Bhopal and St. Xavier's College, Mumbai. Shri Chaudhary is also Director on the Boards of Hindustan Paper Corporation Limited, Hindustan Cables Limited and Andrew Yule Company Limited.
Shri Vineet Nayyar, aged 66 years, is currently Vice Chairman of HCL Technologies and Chief Executive Officer of HCL Perot Systems. During a career spanning 39 years, Shri Nayyar has handled an array of vastly different and critical assignments.

As member of the prestigious Indian Administrative Services, he served the Government of India in various capacities including Director, Department of Economic Affairs. He also served two tenures with the World Bank holding diverse portfolios including Director of Oil and Gas Department and Chief of Energy operations for East Asia. The last position held in Government service, was as Chief of Energy, Finance, Industry and Infrastructure.

He was also Chairman & Managing Director of Gas Authority of India Limited for a period of five years.

TRIVENI - A PROFILE

1. Introduction

Triveni is an established, dynamic and professionally managed Rs 10 bn company. Our core competencies are in the areas of sugar, steam turbines, gears and water & waste water treatment, derived from years of experience and through an excellent blend of people, technology and entrepreneurship.

One of the 250 largest companies in India.
One of the largest producers of sugar in India.
Market leader in high speed gears and gear boxes.
Technology based solution provider for the water and waste water treatment industry.

Leading producer of steam turbines up to 15 MW and a provider of comprehensive solutions for steam-based power generation ranging from 0.5 MW to 50 MW.

2. Sugar division

Turnover, 2004-05 : Rs. 8.13 bn
Turnover growth : 68 per cent
Turnover growth CAGR (5 years) : 16 per cent
Division turnover as a proportion of the company turnover, 2004-05 :
78 per cent
Plants : Khatauli and Deoband in West UP, Ramkola in East UP

OVERVIEW

The company’s installed capacity of 25,250 tcd across the three units is among the largest in India. The company’s Khatauli unit is credited with
having crushed the largest quantity of sugar across any unit in India in the 2004-05 sugar season.

**RATIONALE FOR PRESENCE**

India is the largest consumer of sugar and its per capita consumption is still below the levels achieved by peer countries (see graph). With a projected increase in per capita incomes and an improvement in lifestyle quality across India’s middle and lower economic classes, we expect that sugar consumption will increase significantly on account of two factors: the crossover from the consumption of gur and khandsari to sugar and an increase in direct and indirect consumption by all sections of the Indian society.

**VALUE PROPOSITION**

Sugarcane is the only significant raw material for the domestic sugar industry. Consequently, any interruption in sowing or harvesting of sugarcane could lead to a detrimental impact on the sugar industry at large and to our company. As a forward-looking organization, TRIVENI is actively engaged in mitigating foreseeable risk factors. In relation to fostering the availability of sugarcane in its ‘command area’, TRIVENI protects farmer interests in a number of ways – ensuring consistent and equitable cane purchase from farmers, providing access to advanced farming best practices, arranging timely remuneration and taking a leadership position in community development. In turn, these initiatives encourage farmers to allocate a significant acreage towards the cultivation of sugarcane, making the arrangement mutually rewarding. The quality of the company’s output has helped it graduate to the status of a major brand in India’s retail and wholesale markets, thereby enabling it to enjoy a premium and a distinctive recall in a relatively unbranded marketplace.
STRENGTHS

• Advanced technological assets and capital equipment, represented by world-class continuous vacuum pans at the B (sugar boiling) and C (sugar boiling) stages, resulting in boiling consistency, uniform crystal size, reduced molasses purity, decline in steam consumption and enhanced product quality. The technology and intellectual property for this equipment were jointly developed with Sugar Research international, the premier Australian organization.

• Positive recall in a competitive marketplace, translating into a premium and quicker off-take.

• The location of the sugar manufacturing plants in the fertile Doab region (between the Ganga and Yamuna rivers), resulting in a superior sugarcane quality and an exceptionally high yield.

• Canal water availability over a large part of the region, representing one of the highest penetrations of man-made water interventions in India, reducing the company’s dependence on monsoon vagaries.

• Established culture of cane cultivation in the region.

• Largest cane crushing capability across any one unit in India (18.66 million quintals in the 2004-05 sugar season at Khatauli); a quicker crush enables the farmer to grow wheat on fallow land and earn an attractive supplementary income.

• Excellent cane procurement logistics, critical for any large sugar unit, demonstrated in the systematic pooling of cane from no less than 220 purchase centers in the Khatauli command area without any shortage or inventory pile-up.

• Dependable relations with more than 160,000 farmers across the Khatauli, Deoband and Ramkola command areas, resulting in a reliable and increasing supply of sugarcane.
- Strong in-house technical and project management capability, resulting in the commissioning of the Deoband co-generation project in the fastest implementation time lines; proposed expansion of the Khatauli capacity from 11750 tcd to 16000 tcd.

- Vast project execution experience in setting up sugar plants and carrying out expansions in view of our earlier experience in sugar plant machinery and through our subsidiary, Triveni SRI Limited.

**OPERATIONAL PERFORMANCE IN THE 2004-05 SUGAR SEASON**

Company's Khatauli, Deoband and Ramkola units crushed 18.66 mn tonnes, 13.8 mn tonnes and 3.4 mn tonnes of sugarcane respectively SMP payment needed to be made by each factory, calculated on the basis of Rs. 0.88 per quintal for an every 0.1 per cent increase in recovery over 8.5 per cent. The SMP for Khatauli, Deoband and Ramkola units were fixed at Rs. 89.46 per quintal, Rs. 92.10 per quintal and Rs. 87.70 per quintal respectively.

For the purpose of extra sugarcane payment to growers above the SMP, a formula of sharing sugar realizations with the growers has been prescribed under Sugarcane Control Order, 1966. After the 'L' factor (representing the cost of production) based on the SMP is announced by the Government (which invariably comes some two or three years later), the cost based on the L factor is subtracted from the actual realization of sugar; 50 per cent of this extra amount is shared with growers. In reality, factories in U.P. invariably pay much more than what is warranted by this formula as State Advised sugarcane Prices (SAP) announced by the U.P. government are higher than the SMP by more than the 50 per cent sharing payable. State advised price A majority judgment of the Supreme Court dated 5 May 2004 held that the State Government in U.P., in exercise of its regulatory power as contained in the U.P. Sugarcane (Regulation of Supply &
Purchase) Act 1953, could fix the price of sugarcane. A review petition filed by ISMA, highlighting the inconsistencies with an earlier unanimous decision of a five-judge bench of the Supreme Court of 1956 in Ch. Tikaramji's case, and other specific constitutional points, was turned down.

The U.P. Government announced an SAP higher than that paid by the industry in 1996-97, 2002-03 and 2003-04. On a demand made by the Sugarcane Societies and the U.P. Government, Triveni made all these payments for its three sugar units under protest, making it one of a handful of such factories in U.P. to have done so.

Global corporate strategy

In the opinion of leading international sugar expert F.O. Licht, regulatory, technological and organizational issues will drive the growth of sugar companies. Since sugar is an agricultural commodity, the last factor is expected to influence profits the most. In this connection, it would be reasonable to assume that regulatory differences between various production locations may decline. As a result, companies that profited from 'regulation rents' (guaranteed income within a protected business environment) will need to change their strategy to protect their longer-term survival.

The last of these determinants limits the expansionary drive of sugar companies to national and/or supranational entities (EU) where an identical set of rules guarantees a high degree of planning security. The regulatory environment under which sugar companies operate is often challenging, requiring skill, experience and political clout.

From an international perspective, the industry structure of the sugar sector is surprisingly mature and yet fragmented; technology is advanced but innovations restricted to 'normal technological progress'; markets saturated but driven by economic or population growth. As a result,
technological economies of scale are important in determining the size of an individual plant.

3. CO-GENERATION

Bagasse-based cogeneration power is a renewable, environment friendly driver of sustainable development. The Government of India has issued the national electricity policy which calls for the promotion of cogeneration and generation from renewable sources of energy. It also calls for progressively increasing the share of electricity from non-conventional sources as prescribed by state electricity regulatory commissions.

The potential of bagasse-based cogeneration in India is estimated at around 3500 MW of which over 750 MW has already been installed. Uttar Pradesh, a power-deficit state, is experiencing an average power shortage of approximately 12 per cent and a peak shortage of about 20 per cent. The potential of exportable power from the state’s sugar mills is estimated at 1000 MW, of which approximately 150 MW has been installed / under construction.

Your company commissioned a 22 MW ultra-modern and energy efficient, bagasse-based cogeneration power plant at Deoband on December 5, 2004. This plant, completed in one of the fastest implementation timelines in India, utilises a high pressure (87 Ata) and temperature (515 degree C), 120 TPH boiler and a matching 22 MW double extraction condensing turbo- generator with supporting auxiliaries.

The highly efficient turbine as per global benchmarks was sourced from Skoda, Czech Republic. Superior technology and project management resulted in a high availability of the plant since commissioning. This Rs. 760 mn cogeneration plant is fully automated, using a sophisticated DCS. For maximising energy efficiency, a large number of variable frequency drives have been added. The boiler is fitted with electro-static precipitators,
which allows the plant to minimize emissions far below the norms prescribed by the state pollution control board.

The electricity produced by the cogeneration power plant was sold to the Uttar Pradesh Power Corporation, with which your company has a power purchase agreement for 10 years. The applicable price for the year 2004-05 was Rs.2.81 per unit.

Your company also embarked on the commissioning of a similar 23 MW cogeneration power plant at Khatauli.

This cogeneration plant will incorporate a Skoda turbine and equally sophisticated equipment, similar to the plant in Deoband, but will additionally utilise a continuous electro deionization polishing step in its boiler feed water system (installed through the Water Business Group of TRIVENI) with the objective to eliminate chemical handling as well as improve water quality. This will be the first installation of this world-class technology in the power segment in India; the installation itself will be one of the largest in the world. The cogeneration of power across these two projects is expected to represent a stable and predictable proportion of the company’s bottom

4. Turbine business group

Turnover, 2004-05 : Rs. 1.75 bn
Turnover growth : 33 per cent
Turnover growth CAGR (5 years) : 20 per cent
Division turnover as a proportion of the company turnover, 2004-05 : 17 per cent
Plant : Bangalore

OVERVIEW
TRIVENI continues to enjoy a leading position in India’s steam-based industrial power generation and rotating machinery segments. The Turbine Business Group has the capability to offer comprehensive solutions for steam-based power generation ranging from 0.5 MW to 50 MW.

**RATIONALE FOR PRESENCE**

- India’s power demand is expected to increase to 200,000 MW by 2012 against an installed capacity of approximately 110,000 MW.

- The Electricity Act 2003 and National Electricity Policy encourage captive, IPPs and cogeneration power plants, a segment catered to by the company. This has already resulted in a large number of small, distributed power plants being installed.

**VALUE PROPOSITION**

- Cost leadership leading to an enhanced price-value proposition for customers.

  - Differentiation on the basis of customer proximity.

  - An extensive service network and skilled personnel that allow us to actively market a lifetime relationship with the customer; the offer of O&M services in addition to the spares, servicing and AMC services.

- The overhaul of over 700 turbines every year. In the unlikely event of any breakdown, our norm for response time is 24 hours for accessible areas and 48 hours for inaccessible areas (generally bettered). Consequently, according to our estimates, the average uptime for turbines is over 99 per cent.

- Delivery of a reliable, efficient turbine customized around the customer’s requirements and delivered on time.
STRENGTHS

- One of the leading players with a substantial market share.
- A base of over 1450 functioning turbines.
- Strong research and development capabilities.
- Focus on service.
- Modern infrastructure and facilities.
- ISO 9001 and ISO14001 certified.

PERFORMANCE REVIEW, 2004-05

The company’s turnover from this business group increased from Rs. 1.32 bn in 2003-04 to Rs. 1.75 bn in 2004-05, corresponding to an increase in wattage delivery from 184 MW to 218 MW. This increase was largely derived from the setting up of new captive, IPPs, and process cogeneration plants, the majority of the orders being derived from the steel, paper and IPP segments.

- Steel: The commissioning of a large number of new steel plants as well as capacity expansion by the existing ones were accompanied by the waste heat utilisation for the power generation projects, generating a strong demand from this segment.

- IPP: The government’s encouragement for biomass and renewable power led to significant new capacity additions.

- Paper: The sector continued to perform well. Even as competition in the upto 15 MW range of steam turbines primarily comprised Siemens (DDIT) and Hangzhou (China), the company successfully maintained its considerable market share. BHEL, Beliss etc. accounted for a marginal share of this segment.

The company’s exports were Rs. 105.4 mn in 2004-05. Until 2004-05, the company had exported to Bangladesh, China, Finland, Guyana,
Indonesia, Ireland, Jamaica, Kenya, Korea, Malaysia, Nepal, Pakistan, Philippines, Sri Lanka, Tanzania, Turkey, Thailand, Uganda, Venezuela, Vietnam and Yugoslavia. Now exports to northern Europe were made to Wartsila AB while orders were also booked from a Japanese original equipment manufacturer.

**FORWARD-LOOKING STATEMENT**

The optimism of this business group is based on its attractive order book, a projected increase in production from a wattage delivery of 218 MW in 2004-05 to over 400 MW in 2005-06. The demand trend is expected to be as follows: the sub 3 MW segment is expected to lose ground to the 6-15 MW and 15-25 MW steam turbine segments, with the latter finding increasing favour in India’s sugar, cogeneration, steel, cement and paper segments; besides, the overall turbine demand is expected to stay robust.

The company expects to capitalize on this market reality through the following initiatives:

- Commercialisation of in house technology already developed for models up to 22 MW in the next 18/24 months.

- Agreement to package Skoda Power’s steam turbines above 16 till 50 MW.

- Doubling capacity by March 2006 to cater to the increasing demand and higher margins.

- Quicker delivery In this division, the company enjoyed an order book of Rs.2.97 bn as on March 31, 2005 (sales of Rs. 1.75 bn in 2004-05) or nearly equivalent to projected 12 months of sale for 2005-06. Nearly 20 per cent of the revenues is expected to be derived from exports by 2007-08.

As a result, this business group is expected to emerge as a robust driver of corporate growth over the foreseeable future.
The business of turbines is perhaps more sophisticated than most other technology led business on the grounds that it combines precision engineering with manufacturing. Reason: a solution of optimised efficiency is engineered around a client’s requirement and then the turbine is manufactured with a precision to ensure that the design parameters are comprehensively addressed.

Over the years, the company has distinguished itself in the industrial and marine segments not just through the rapid absorption of capabilities from leading technology providers, but also through in house technology development customised around client needs. This has been derived through an ability to perform world-class computational fluid dynamics, finite element analysis, performance cycle optimization, blade vibration analysis, stress analysis and rotor dynamics analysis. Over the years, these capabilities have enhanced efficiency and availability at the customers’ premises.

The company’s most impressive accomplishment was the completion of an R&D project wherein the services of Impact Technologies (USA) and consulting professors from the Indian Institute of Science, the Indian Institute of Technology and the University of De Montfort (UK) were utilised. The result was the successful development of highly efficient low pressure twisted and tapered blades. The company already has received orders for turbines incorporating these blades, which will be commissioned in April 2006.

The company also developed new efficient turbine designs upto 22 MW.
5. High speed gears

Turnover, 2004-05: Rs. 275.5 mn
Turnover growth: 27 per cent
Turnover growth CAGR (5 years): 29 per cent
Division turnover as a proportion of the company turnover, 2004-05: 3 per cent
Plant: Mysore, Karnataka

OVERVIEW

In 1976, the gear division was started as a backward integration of the turbine division. This business unit's success helped it evolve into an independent business group, servicing captive and external clients (some happen to be the company's turbine competitors) from 1980 onwards.

Today, this division has emerged as a market leader for high-speed gears and manufactures a range up to 70 MW at speeds up to 50,000 rpm.

RATIONALE FOR PRESENCE

The Electricity Act 2003 encourages the commissioning of captive power/co-generation plants, which use turbines equipped with high-speed gears. Besides, the economic viability of captive thermal power plants in the steel, sugar, paper and other process industries has also emerged as a demand driver. The extension of these trends justifies the company's presence within this business.

VALUE PROPOSITION

- The company provides world-class technology products and solutions for high speed and specialty slow speed gearing applications. Over the years, the division has extended its business line to the
refurbishment of gearboxes of various manufacturers, testifying to its technology understanding and product superiority.

- The company has extended its technology to niche areas substituting competing imported products.
- Cutting-edge machinery has allowed TRIVENI to achieve a product quality comparable with any global gear manufacturer.

TECHNOLOGY AND OUR GEARS DIVISION

Over the years, the High Speed Gears Business Unit successfully developed its own technology for products up to 7.5 MW. It also collaborated with Lufkin Industries Inc. to address the growing 7.5-15 MW demand. The company’s extended exposure enabled it to become technologically self-sufficient in the 7.5-15 MW segment as well. As a result, the division manufactures complete gearboxes including the in-house manufacture of rotating gears.

The ongoing collaboration with Lufkin Inc. enabled the company to cater to the 15-70 MW demand, wherein the gearboxes are assembled using rotating gears manufactured by its collaborator. As a result, the company addresses the market needs in high-speed gears up to 70 MW in one way or the other.

In view of the deep technology skills, the company was selected by Lufkin France to execute a drafting and hi-end designing assignment, which enhanced its high end design credibility. Due to pioneering engineering skills, the company has established its reputation as a major player in the retrofitment segment for high speed gears. As a result, it derives nearly 30 per cent of its revenues from this line of business, growing its knowledge capability due to a continuous exposure to diverse technologies.


**STRENGTHS**

- Market leadership with a substantial share.
- Long-standing and preferred supply relationships with esteemed original equipment manufacturers like BHEL and Siemens DDIT etc.
- Access to world-class technology through a license agreement with Lufkin Industries Inc.
- Engineering strength amply demonstrated through its refurbishment service.
- World-class infrastructure demonstrated through state-of-the-art assets and infrastructure.

**PERFORMANCE REVIEW, 2004-05**

- The business group achieved a 27 per cent sales growth and finished the year with a turnover of Rs. 275.5 mn.
- About 80 per cent of its OEM revenue was derived from sales to the power industry and about 15 per cent to the pumps and compressor industry.
- The retrofitting / replacement market (including import substitution) contributed to a healthy bottom line.
- The unit continued to provide a substantial proportion of BHEL’s and Siemens DDIT’s gear box requirements.
- The unit invested in large CNC profile grinding and CNC hobbing machines from Gleason Pfauder (Germany), a globally renowned manufacturer. These grinding machines can produce DIN3 quality and can grind up to a 1.6 meter diameter and hob up to a 2.0 meter diameter, which significantly enhances the unit's capacity and capabilities. For example, a gear that took 100 hours to grind on old machines is now expected to take only around 15 hours. The unit also invested in expanding the existing assembly bay in order to respond to growing demand. The unit’s quality
commitment was demonstrated in the successful completion of a number of Six Sigma projects during the year.

- The unit made consistent sales to the niche segment of hydro-turbines for the first time.
- The unit added 3 Pro-E stations and designers who were trained at Lufkin (France) in hydel gear box technology.
- The unit finished the year with a healthy order book including a significant breakthrough in securing a specialised slow-speed gear box order of Rs. 20 mn from Manikgarh Cement.

FORWARD-LOOKING STATEMENT

The unit is optimistic of prospects for 2005-06 due to the likely outsourcing of machined equipment by Lufkin Industries Inc., a buoyant market for power equipment as well as capital goods industries, reflected in its orderbook equivalent to nearly nine months of offtake of 2004-05.

The company expects to sign an extension of its license agreement with Lufkin Industries Inc. by May 15, 2005, to extend its direct manufacturing range and vastly increase the number of countries to be included in the new agreement. Previously the market was limited to India for the licensed range and the company expects to be able to market in South-Asia and Africa.

The unit expects to substantially grow the business in the next few years for the following reasons:

- The export market for sub-25 MW high-speed gears is estimated at Rs one bn. for the territory mentioned above with a large potential in the small power gear box segment.
- A 20 per cent cost advantage over European competitors.
- A growing international demand in the sub 7.5 MW segment, where the company is technologically selfsufficient.
- A strong relationship with Lufkin Industries Inc., enabling the latter to originate business enquiries for the company for exports to South Asia.
The unit's focus is to carve a major share in the small high power gear box segment from original equipment manufacturers (OEMs) and retain a significant presence in the smaller segment. The unit supplied a number of hydel gear boxes for VA Tech; it has since been selected as a key supply partner by the company. The unit expects to achieve significant growth in turnover and margins in the next few years.

6. Water business group

Turnover, 2004-05: Rs. 81.5 mn.
Turnover growth: 36 per cent
Division turnover as a proportion of the company turnover, 2004-05:
1 per cent

OVERVIEW

TRIVENI enjoys an encouraging position in the nascent businesses of water and waste water treatment solutions in India. The company distinguishes itself in the marketplace through its offering of the most comprehensive set of water and wastewater treatment products and solutions in India.

RATIONALE FOR PRESENCE

The company’s presence is not only advisable but also absolutely imperative from a national perspective for the following reasons:

• An increase in population and development are increasing the pressure on pollution, environmental exploitation and ecological degradation in India at a time when the judiciary is stepping in to protect citizen interests.
• Nearly 70 per cent of India’s surface water and a growing proportion of its ground water resources are polluted and unfit for consumption.

• Domestic wastewater accounts for the pollution of India’s 14 major river systems; 50 mn M3 of untreated sewage is discharged into them each year.

• Industrial waste is another polluter; although it accounts for only 3 per cent of India’s water withdrawal, its toxic addition to the effluent load is disproportionately higher and tends to reside in the ecological system for decades.

• The World Bank estimates that water demand will increase from 552 bn cubic metres (BCM) to 1050 BCM by 2025, increasing the need for water treatment and wastewater treatment solutions.

• In India, per capita fresh water availability declined from 5000 metre cube per year (M3 / year) in 1947 to 2000 M3/year in 1997 and is expected to decline to 1500 M3 / year by 2025. Six out of India’s 20 major water basins have already declined below the water scarcity threshold limit of 1000 M3 / year and there is a fear that this number might increase to 11 over the next three decades.

• The size of India’s environmental industry has been annually estimated at between USD 1-3.5 bn. KPMG estimates that India’s water and wastewater treatment market will be of the order of Rs. 26 bn to Rs. 33 bn per annum (on the basis of existing technologies). Nearly 71 per cent of this market will be accounted by industrial segments, growing annually by about 5 per cent. Demand for water and wastewater solutions from India’s industrial sector will be driven by an increase in manufacturing capacity, higher water costs, stricter regulations and a better discounting for environmentally compliant companies on the capital market.

• In this large and growing space marked by regional solutions providers, no company enjoys a turnover of more than Rs. 2.50 bn, an attractive opportunity for a nationally positioned solutions provider.
The prevailing technologies in water and wastewater treatment in India are grossly ill-equipped to address the magnitude of the pollution problem.

**VALUE PROPOSITION**

- The company possesses a rich 20-year experience in the marketing, process engineering and execution of the pre-treatment section of water treatment with a successful track record of around 60 projects; its extension into high value added mechanical equipment for the water and wastewater treatment in 2003-04 represents an extension of the value chain.

- The company is present across the whole process and value chain: from pre-treatment to high purity to the recycle of water and wastewater, for both industrial and municipal applications.

- The company enjoys collaboration with the $1.2 bn US Filter (Siemens Group) in the areas of water and wastewater treatment.

- The company represents cutting edge technology supported by a high standard of customer service across the complete lifecycle-production to commissioning to maintenance of the solution-differentiator among domestic companies.

**STRENGTHS**

- The company possesses a large and highly skilled team of professionals with a rich industry experience, translating into superior solutions for customers.

- The company possesses a large customer base, useful for customer references in generating new business.

- The company's business utilizes little capital while enjoying high margins.

- The company provides equipment (as opposed to turnkey solutions), which enables it to avoid competing with its clients.
TECHNOLOGY AND OUR WATER BUSINESS DIVISION

Over the years, the company has brought advanced technologies to the Indian market through a close relationships with several business groups of US Filter Inc.:

- Envirex for conventional treatment equipment (license agreement since 1987)
- Ionpure for continuous electro deionising (CEDI) equipment
- Memcor for Membrane Bio-Reactor (MBR) and micro-filtration membrane solutions and equipment
- Process Water Systems for process engineering and support.

Going ahead, the company expects to revolutionise India’s water and wastewater treatment segments through the introduction of various technologies relevant to the current / evolving market needs, particularly the following:

CEDI technology

Relevance: India’s water treatment business in the power sector

Source: Ion Pure (US Filter)

Replacing: Conventional de-mineralisation based on resin.

Advantages:

- Absence of chemical additives
- Safe for human handling
- Use of a tenth of the conventional space
- Reduced Boiler Blowdowns
- Four year payback

Membrane technology – Microfiltration

Relevance: India’s waste water treatment business in recycle / reuse segment.

Source: Memcor (US Filter)

Replacing: Conventional Clarifier and aerobic biological treatment
Advantages:

- Barrier filtration technology that can rationalise coliform content in polluted water to less than safe limits making the water conducive for marine life.
- Enhanced post-treatment water quality or downstream cities down to only 3-4 ppm BOD.
- Zero discharge and the absence of additives to treat the water, minimizing side effects.
- Lower space requirement (a quarter of the normal plant size) and a 40 per cent power cost saving over the conventional system.
- Minimal civic disruption; more than 70 per cent of value addition done in the workshop.
- Automated with minimal human interface.
- The company focuses and has access to value-added/ high technology products and solutions, which translate into better margins due to limited competition.

**PERFORMANCE REVIEW, 2004-05**

The company restructured with the objective to enhance its core competence in mechanical equipment engineering and manufacturing in the water and wastewater treatment industry. It evolved from a turnkey operator to a mechanical equipment supplier during 2004-05 and, in doing so, increased its turnover from Rs. 59.7 mn in 2003-04 to Rs. 81.5 mn in 2004-05.

The business group manufactures a diverse set of products and solutions based on conventional and value added technology-centric systems. In May 2004, the company signed an agreement with a US $ 1.2 bn US Filter Corporation (part of SiemensAG, Germany), the largest water and wastewater treatment equipment and solution provider in the world. The company’s association with this global leader will enable it to access the
most comprehensive product portfolio among all Indian players: from clarifiers, aerators and filters to dewatering equipment to membrane solutions.

During the year under review, the company entered the field of high purity water systems, securing several orders for sophisticated and progressively automated membrane solutions. Besides, the company maintained its high market share in conventional treatment equipment with large EPC customers like L&T, Degremont, IVRCL, ECA and Nagarjuna Construction.

The company strengthened its international exposure through the export of clarifier drive heads through US Filter to a number of customers across the world. It received a first-of-its-kind order for a continuous electrode-ioniser (CEDI) made by Ionpure, a subsidiary of US Filter. The company successfully exhibited and participated in a number of conferences and expositions, generating a good response to its products.

FORWARD LOOKING STATEMENT

The water treatment business is incentivised by the increasing demand and limited supply for water for both industry as well as municipalities. This optimism is reflected in the company’s order book: within the first two months of the year under review, order book exceeded the entire billing of 2004-05. This sharp growth was derived from customised solutions, a first mover’s presence in a fragmented market and the nascent stage of the water treatment and wastewater treatment market in India.

7. Triveni Khushali Bazaar

Turnover, 2004-05: Rs. 12.4 mn

Presence: Khatauli, Deoband and franchise stores in Sisauli, Jansath and Ghatain
Commenced operations: February 2005.

**OVERVIEW**

Triveni leveraged its rural presence with a synergic diversification into agri-retail through the commissioning of branded stores called Triveni Khushali Bazaar.

**RATIONALE FOR PRESENCE**

India's agri-retail industry is presently fragmented, similar to where urban retail was Indian a decade ago. Recognising its vast scope and the fact that organized retail is one of the fastest growing sectors in India, several companies like ITC, DCM Shriram and Godrej enhanced their presence through rural retail stores.

**VALUE PROPOSITION**

In rural India, organized retailing is practically absent. As a result, farmers are often exposed to exploitation from intermediaries. Your company's intervention will prevent that in the areas of its presence. For one, it enjoys excellent longstanding goodwill with sugarcane growers in particular and the high brand equity of Triveni in general. Besides, the company is perceived as being closely aligned with farmer goodwill.

The company's retail stores cater to the needs of farmers and rural customers through the marketing of quality agri-inputs and day-to-day requirements of FMCG and agri-related products.

The company entered into a tie-up with a number of large companies to market their brands, circumventing intermediaries and helping price products competitively. Triveni Khushali Bazaar stores will also provide modern farm equipment on rent. Besides, the company's agronomists present at the stores advise farmers on the best crop management practices.

**STRENGTHS**
Triveni Khushali Bazaar is a one-stop shop for farmers and rural customers where they can buy agri-inputs like seeds, fertilizers, pesticides; cattle feed, cycle, plastic furniture and FMCG; automobiles like tractors and bikes; building material like cement as well as petroleum products like diesel and petrol.

**PERFORMANCE REVIEW, 2004-05**

The company commissioned a store at Khatauli and Deoband, the former on a three acre plot, in addition to franchise stores at Sisaul, Jansath and Ghatain. The first Triveni Khushali Bazaar was commissioned in February 2005 and within two months, generated revenues of Rs. 12.4 mn and average footfalls of around 300 (peak 800) accompanied by a high conversion rate.

**FORWARD-LOOKING STATEMENT**

Encouraged by this success, your company plans to open new stores not only in the command area of the existing and proposed sugar mills but also in Western Uttar Pradesh towns in 2005-06.

Triveni Khushali Bazaar is a one-stop shop for farmers and rural customers where they can buy agri-inputs, cattle feed, cycle, plastic furniture, FMCG, automobiles, building material and petroleum products.

**8. Financial review**

There has been a substantial improvement in the results, reflected in an across-the-board improvement in the financial ratios. It is the endeavor of the company to strengthen its financial position through a rapid expansion in all its business segments through accruals and a progressive reduction in debt.

Being a seasonal industry, sugar stocks were at their peak in March end, as a result of which working capital loans were at their highest. Such loans
were at Rs. 3104.8 mn on 31st March 2004 but had subsequently declined to Rs. 1672.8 mn(almost 50 per cent) by September 2004. Thus, the unusually high gearing at the end of the company's financial year did not reflect the true gearing of the company.

**TURNOVER**

During the financial year under review, gross turnover increased by 60 per cent to Rs.10.21 bn, a record for the company. Sugar sales increased by 68 per cent, turbine sales by 33 per cent and gear sales by 27 per cent. The cogeneration plant at Deoband commenced operations in December 2004 and during the limited period of working in 2004-05 contributed Rs.183.3 mn to the turnover.

The business segment wise gross revenue is provided here below:

<table>
<thead>
<tr>
<th>Ratios</th>
<th>2004-05</th>
<th>2003-04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Profit/Net turnover (per cent)</td>
<td>18</td>
<td>11</td>
</tr>
<tr>
<td>PBT/Net turnover (per cent)</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>PAT/Net turnover (per cent)</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Interest cover</td>
<td>4.98</td>
<td>2.75</td>
</tr>
<tr>
<td>Earning per share (Rs. per share of Rs.1 each)</td>
<td>11.94</td>
<td>2.07</td>
</tr>
<tr>
<td>PAT/Net worth (per cent)</td>
<td>58</td>
<td>15</td>
</tr>
<tr>
<td>Long term loans/Net worth</td>
<td>0.67</td>
<td>0.62</td>
</tr>
<tr>
<td>Total loans/Net worth</td>
<td>2.68</td>
<td>3.49</td>
</tr>
<tr>
<td>Debt servicing coverage</td>
<td>2.63</td>
<td>1.66</td>
</tr>
</tbody>
</table>

**FINANCIAL RATIOS**

<table>
<thead>
<tr>
<th>Business segments</th>
<th>2004-05</th>
<th>2003-04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar</td>
<td>8131.6</td>
<td>4846.1</td>
</tr>
<tr>
<td>Co-generation</td>
<td>183.3</td>
<td>–</td>
</tr>
<tr>
<td>Turbines</td>
<td>1747.4</td>
<td>1317.6</td>
</tr>
<tr>
<td></td>
<td>2003-04</td>
<td>2004-05</td>
</tr>
<tr>
<td>----------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Gears</td>
<td>275.5</td>
<td>216.4</td>
</tr>
<tr>
<td>Water / waste water</td>
<td>81.5</td>
<td>121.0 *</td>
</tr>
<tr>
<td>Others</td>
<td>21.2</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>10440.5</td>
<td>6501.1</td>
</tr>
</tbody>
</table>

2003-04
- Sugar: 74.5%
- Turbines: 20.3%
- Gears: 3.4%
- Water/Waste water: 1.8%

2004-05
- Sugar: 78%
- Turbines: 16.7%
- Gears: 2.7%
- Co-generation: 1.8%
- Water/Waste water: 0.8%
- Others: 0.2%

* including revenue of Rs. 61.2 mn for project activities which have been discontinued

Notes: These are prior to inter unit elimination Rs. mn
EXPENSES

Cumulative expenses increased 16 per cent over the previous year as against an increase in net turnover by 62 per cent (in the manufacture of sugar, raw materials and other manufacturing expenses were related to the production rather than the turnover during the year under review). The various expenses are briefly described below:

Raw material

This increased by 20 per cent to Rs. 6007.8 mn in 2004-05. The cane crush during the year declined by 15 per cent over the previous year as the financial year 2003-04 include the impact of a longer season 2002-03 due to a late commencement. Cane price increased significantly. Further, a charge of Rs. 236.0 mn in respect of the differential cane price, arising from the Supreme Court judgment as explained here pertaining to the sugar produced in earlier season but sold in the current year, was also considered.

The increase in raw material costs in the engineering units was on account of an increase in turnover. In view of the Supreme Court judgment in May 2004 upholding the power of the State Government to fix the cane price over the statutory minimum price, the company provided the entire differential cane price (Rs. 604.6 mn) for the seasons 1996-97, 2002-03 and 2003-04 during the year under review. Further, to state realistic profits for the current year, in respect of the differential cane price of Rs. 368.6 mn relating to sugar produced in such years but sold in earlier years, an equivalent amount was withdrawn from the Amalgamation Reserve (Rs. 26.5 mn), General Reserve (Rs. 309.4 mn) and Surplus (Rs. 32.7 mn) to meet the charge. The withdrawal from the Amalgamation Reserve was on account of the cane differential price relating to 1996-97 for Khatauli sugar unit pertaining to the erstwhile Triveni Engineering & Industries Ltd. prior to the merger.
Manufacturing / operating expenses

Such expenses declined by 4 per cent to Rs.523.9 mn in 2004-05 due to a 15 per cent lower crush, but somewhat offset by an increase in the company’s engineering business.

Personnel cost

In absolute terms, this expenditure increased by Rs. 27.9 mn or 6 per cent over 2003-04 on account of a secular annual increase as well as additional manpower recruited for the cogeneration project. As a proportion of to net turnover, personnel expenditure was at 6 per cent in 2004-05 as against 9 per cent in 2003-04.

OPERATING PROFIT

The operating profit of the company increased from Rs. 0.65 bn in 2003-04 to Rs.1.72 bn, an increase of 166 per cent. Operating profit to net sales increased from 11 per cent in 2003-04 to 18 per cent in 2004-05 largely due to the enhanced contribution from the company’s sugar operations. The increase in operating profits in the engineering business groups was limited due to margins being affected by an unprecedented increase in steel prices. As prices were subsequently revised by the turbine and gear units, and, based on orders on hand, a substantial improvement in operating margins is expected in 2005-06.

FINANCE COST

Total finance cost increased by 33 per cent to Rs.297.8 mn. Interest on fixed loans increased by only 30 per cent on account of additional loans availed to fund new projects, though the average utilization of the term loans during the year was higher by 47 per cent as their average cost declined and is expected to reduce further when the impact of cheaper loans (including from SDF) will be fully felt. Interest on working capital finance was lower at Rs.188.4 mn as compared to Rs.198.1 mn. The average utilization of working capital finance was marginally higher than in the previous year, but average cost declined. Despite rising interest rates, these costs are expected
to reduce in view of the higher limits of commercial paper that the company intends to use following an up-gradation in its short-term credit rating. The company was awarded a short-term rating of ‘A1’ awarded by ICRA in August 2002 for Rs.500 mn, currently revised to ‘A1+’ (highest safety) with an increase in limit to Rs.2.25 bn.

**PROFIT AFTER TAX**

The company achieved a profit before tax of Rs. 1241.1 mn in 2004-05 as against Rs. 255.2 mn in 2003-04, an increase of 386 per cent. The total tax charge was Rs.245.9 million as against Rs.77.6 mn in 2003-04. The profit after tax was at a record Rs. 995.2 mn against Rs.177.6 mn in 2003-04, an increase of 460 per cent.

**SHARE CAPITAL**

During the year under review, 50 per cent of the value of preference shares (Rs.19.8 mn) was redeemed and the rest were redeemed after the expiry of the year on 1 April 2005. Subsequent to the year, the Board of Directors, subject to the approval of the shareholders, recommended bonus shares in the ratio of 3:2 by capitalising a part of the Securities Premium Account.

**RESERVES**

Reserves as on March 31 2005 increased by 34 per cent to Rs.1.84 bn after adjusting Rs.63.6 mn towards the premium paid on the redemption of the preference shares and following the withdrawal of Rs. 368.6 mn to meet the extraordinary charge in respect of a differential cane price pertaining to the earlier years. An increase in net worth helped the company strengthen all its leverage ratios despite an increase in loans to fund ongoing projects.

**FIXED ASSETS**

During the year under review, fixed assets increased by Rs.1.17 bn following the implementation of the modernization and co-generation projects at Deoband as well as the commissioning of the new imported grinding and hobbing machines at the Mysore gear unit. Capital work-in-
progress as on 31.3.2005 was Rs. 300.4 mn, mainly pertaining to projects at Khatauli.

9. SOCIAL AND COMMUNITY SERVICE

MYSORE

Triveni’s Mysore unit (gears division) made sensitive contributions towards community development.

- It worked with Child Labour Rehabilitation Cum Welfare Fund, an organization that takes care of under-privileged children, especially those from rural districts of Mysore.

- It worked with the World Renewal Spiritual Trust, a unit of Brahma Kumaris in Mysore actively involved in improving lifestyles through spiritual education and empowerment.

- It contributed substantially and also participated actively in social activities and seminars, among them noted a one ‘healthy lifestyle’s by Dr. Premasand from Mount Abu.

- It participated in a chess tournament organized for raising funds for tsunami relief under the guidance of the Mysore Rotary Club apart from an employees’ contribution (all employees voluntarily contributed one day’s salary to the PM’s fund, which was matched by the company).

BANGALORE

Triveni’s Bangalore unit (turbines division) is engaged in social and community development in and around the Peenya Industrial Area and in Bangalore city. During 2004-05, it was engaged in the following activities:

- The Government Model Primary School located in Peenya catering to the educational needs of children of workmen engaged in Peenya was affected by road widening, which compelled schools to forego several classrooms. To accommodate them, the Company built one classroom and donated another, addressing the needs of around 40 students.
• The Company contributed towards the construction of a prayer hall in Government Junior College (Peenya).

• The company helped co-conduct a sports event comprising all industries in Peenya to foster sportsmanship.

• The company provided furniture to Mallasandra Village Primary School located near its factory in Bangalore.

**SUGAR UNITS**

Triveni’s sugar units at Khatauli, Deoband and Ramkola engaged in a number of activities to enhance the quality of rural life in an around its areas of influence. Repair, construction and maintenance of roads and irrigation channels

• The company repaired around 14 kms of village approach roads and constructed 5 kms of new roads. This included brick soling and the creation of *pucca* roads to facilitate transportation for villagers and cane growers.

• It distributed culverts and hume pipes to facilitate the irrigations needs of people in its command areas.

• It constructed a room in the school in village Kutesra, besides helping in the construction of two temples and a *gaushala* (cow shelter).

• It conducted cricket and football tournaments in Babbal, Rankhandi, Bhaila and other villages.

**10. BUSINESS OUTLOOK AND STRATEGY**

In view of overall favorable conditions and the efforts of your company to avail the opportunities presented by such an environment, your company is witnessing substantial growth. With a turnover of over Rs. 10 bn and a profit after tax of Rs. 1 bn, Triveni now enjoys a prominent position in Indian industry.

Our corporate vision was to emerge as a leading player in each of our business segments; we enjoy that position today. We now plan to significantly expand operations across all our core businesses. Our capacities
in sugar manufacture and power generation equipment are expected to significantly increase in the next few years. With our emphasis on modernization, technology and human resources, we expect improvements in efficiency and productivity.

According to Government of India estimates, the demand for sugar in India is expected to outstrip production in 2005-06 while the closing stock of sugar at the end of the current sugar year (2004-05) will be almost half the opening stock.

Substantial investments in world-class co-generation facilities at Khatauli and Deoband sugar units will provide additional income. Once the expansion programs are under execution, the company may consider investment in a large distillery to produce alcohol/ethanol from sugarcane. UP Government Sugar Industry Incentive Policy 2004, provides incentives including capital subsidy and other incentives relating to purchase of sugar cane and sale of sugar upon investment of Rs 3.50 bn /Rs 5.0 bn in new sugar capacities, expansion of sugar capacities and sugar related projects, such as, bagasse based cogeneration plants or manufacture of ethanol.

The company possesses adequate land and received relevant regulatory approvals required for a new 7000 tcd sugar factory at Sabitgarh (district Bulandshahar, Uttar Pradesh). The command area of this new plant is covered by canal irrigation to a great extent and is relatively less dependent on the monsoons and tube well irrigation. Your company is evaluating additional sites based on similar criteria and proposes to intensify cane development through the use of institutional credit, faster payments to cane.

11. QUALITY AND ENVIRONMENT
As required by the existing Environment Laws, the company submitted the necessary statements for the year 2003-04 to the U.P. Pollution Control Board. An integral part of the vision of your company is to provide customer satisfaction through the best product and service quality. Your company's Bangalore unit was re-certified for ISO 9001 in 2002 and ISO 14001 in 2005, while the Mysore unit was re-certified for ISO 9001 and ISO 14001 in 2004.

Your Bangalore and Mysore units have embarked upon a Six Sigma programme to achieve quality and service levels in line with the best international standards.

As a corporate social responsibility, Triveni made significant efforts to preserve the environment in and around its sugar and other units. Both sugar units at Deoband and Khatauli took steps to minimize effluent generation with the target to become zero-effluent in the near future. In this direction, a water management system for the re-circulation and reuse of process cooling water was installed at the Khatauli unit.

Oil and grease traps were installed and at Deoband there was an underground water reservoir for collecting the process water for reuse in the factory.

At Deoband, world-class electrostatic precipitators (ESP) were installed in the cogeneration boiler to significantly reduce the emission of suspended particulate matter (SPM). The emissions from the stack were also considerably below the statutory norms of 150 mg/Nm3.

*Energy Conservation Measures*

1 A 22 MW high pressure, fuel efficient Co-generation project at Deoband commenced operations in December 2004. Under this project the company has installed a 120 TPH 87 ata 515°C Boiler which replaced the existing low pressure, inefficient boilers and resulted in considerable energy savings.
2 Installation at Deoband of Auto Combustion control in the 65TPH and 40 TPH 32kg/cm.sq. boilers to increase efficiency of the boilers.

3 Installation at Deoband of DC motors on another three 'A' Centrifugal machines, and the addition of one DC motor driven 1750kg/charge fully automatic centrifugal machine, to reduce power consumption.

4 Installation at Deoband of an auto condensing and cooling system at the Pan floor, and planetary-gear boxes on various crystaliser, for reducing power consumption.

5 Installation of Triveni/SRI Continuous Vacuum Pans for 'B' and 'C' massecuite at Deoband to reduce steam consumption.

6 A new DCS mill control system replacing the old PCS system was installed at Khatauli, and this has streamlined the load on different equipment like cutters, mills etc. resulting in saving of energy.

Additional Investment And Proposals For Reducing Energy Consumption

1 A 23 MW high pressure fuel efficient Co-generation project is being implemented at Khatauli by September 2005 which will also be operated with a 120 TPH 87ata 515o C boiler and a high efficiency Skoda double extraction condensing Turbo Alternator.

2 Installation of a Triveni/SRI design continuous vacuum pan for boiling of 'C' massecuite, and two DC Motor Driven 1750Kg/charge fully automatic centrifugal machines for 'A' massecuite at Khatauli, to reduce power consumption.

3 Installation of AC Variable Frequency Drives and planetary gear boxes at Deoband to reduce power consumption.

Impact Of Above Measures
With the above measures, there will be a substantial conservation of energy, steam, and water, which in turn will improve the efficiency of sugar operations and save more bagasse.

12. Board of directors

Chairman and managing director
Mr. Dhruv M. Sawhney

Board of directors
Mr. F.C. Kohli
Lt. Gen. K.K. Hazari (Retd.)
Mr. M.K. Daga
Mr. R.C. Sharma
Mr. V. Venkateswarlu (IDBI Nominee)

Vice president (legal) and company secretary
Mr. V.P. Ghuliani

13. Company's business locations

Registered office
Deoband, District Saharanpur
Uttar Pradesh – 247 554 • STD Code : 01336
Phone : 222497, 222185, 222866 • Fax : 222220

Corporate office
‘Express Trade Towers’, 8th floor
15-16, Sector 16 A, Noida 201 301 (U.P.) • STD Code : 0120
Phone : 5308000 • Fax : 5311010-11

Turbine business group
12-A, Peenya Industrial Area
Peenya, Bangalore 560 058
STD Code : 080
Phone : 28394721(4 Lines), 28394843, 28394771, 28395276
Fax : 28395211

Gears division
1,2,3 Belagola Industrial Area,
Metagalli, K.R.S. Road, Mysore – 570 016
STD Code : 0821 • Phone : 5280502, 5280501
Fax : 2582694

Khatauli sugar unit
Khatauli, Distt. Muzaffarnagar,
U.P.-251 201 • STD Code : 01396
Phone : 272561 & 272562 • Fax : 272309

Deoband sugar unit
Deoband, District Saharanpur
Uttar Pradesh – 247 554 • STD Code : 01336
Phone : 222497, 222185, 222866 • Fax : 222220

Ramkola sugar unit
Ramkola, Distt. Kushinagar
U.P. – 247 305 • STD Code : 05567
Phone : 256021, 256071, 256072, 256182 • Fax : 256248

Water business group
‘Express Trade Towers’, 8th floor
15-16, Sector 16 A, Noida 201 301 (UP) • STD Code : 0120
Phone : 5308000 • Fax : 5311010-11

Cogeneration deoband
Deoband, District Saharanpur
Uttar Pradesh – 247 554 • STD Code : 01336
Phone : 222497, 222185, 222866 • Fax : 222220
Branded sugar business

‘Express Trade Towers’
8th floor, 15-16, Sector 16 A,
Noida 201 301 (U.P.) • STD Code : 0120
Phone : 5308000 • Fax : 5311010-11

Agri business group

‘Express Trade Towers’
8th floor, 15-16, Sector 16 A, Noida 201 301
STD Code : 0120 • Phone : 5308000 • Fax : 5311010-11

Subsidiary companies

Triveni Sri Limited
104, 1st floor, 99 Grand Plaza
Old Rajinder Nagar Market
New Delhi 110 010

Upper Bari Power Generation Limited
1560, H.I.G. Ground Floor
Sector 70, Mohali
Punjab 160 062

Abohar Power Generation Limited
1560, H.I.G. Ground Floor
Sector 70, Mohali
Punjab 160 062

Corporate information