CHAPTER-V

PRIVATE SECTOR

Private Sector is playing a dominant role in augmenting steel availability in the country. Their contribution in finished steel production increased to 68% in 2001-02 as compared to 45% in 1992-93. Similarly, private sector is also playing a significant role in the production of pig iron and sponge iron.

During pre-liberalization phase, there was only one integrated steel plant in the private sector in the country. This was the unit of the Tata Iron & Steel Co. Ltd. in existence since 1907. In addition, there were a large number of mini steel plants (electric arc furnace units) and steel processing units (i.e. stand alone Hot/Cold rolling mills, galvanising and colour coating units etc.), a few sponge iron units and one pig iron unit. In the post-liberalization phase, the scenario changed with the setting up of several new/green field iron/steel plants. This was associated with structural changes in the sector. While steel plants based on world class capacity and state-of-the-art technologies (viz. Corex technology for iron making, twin shell electric arc furnace and thin slab casting compact strip mill, energy optimising furnaces) were commissioned, inefficient and un-competitive units continued to close down.

Due to unfavourable market conditions, financial performance of the major steel producers in the private sector, barring a few companies like TISCO and Jindal Steel & Power Limited, were affected. Some major private sector companies are facing the problem of unmanageable debt burden and restructuring efforts have been taken recently. The current upturn in demand, resulting in firming of steel prices, is expected to improve the financial performance of the private sector steel plants.

NEW STEEL PROJECTS

The New Industrial Policy, announced in July, 1991, has opened the iron & steel industry for private investment. In the post liberalisation era 19 new/green field steel projects have been sanctioned by the Financial Institutions involving a total capacity of approx. 12.8 million tonnes (saleable steel). The aggregate investment is about Rs. 33,799 crores.

So far, 9 units have been fully commissioned with 5.75 million tonnes per year capacity. Three more units, covering a capacity of 3.7 million tonnes per year, have been partially commissioned of which two are lying closed and one is in production. The remaining projects are at various stages of implementation.

Brief profiles of the major private sector plants are given below: -

TATA IRON & STEEL COMPANY LIMITED

Tata Steel was established in 1907 as Asia's first and India's largest integrated private sector steel company. The company had implemented four modernization programmes to become one of the most modern Steel plants in the World. Recently the company launched a new vision, aiming to become a EVA positive company by 2007.

The company had three thrust areas – customer, cost and change. Recently they have added a fourth area-knowledge. Most of the policies and strategies are focused towards attaining the status of lowest cost producer of steel, which they have attained in production of hot rolled coils. Policies and strategies are implemented through balanced score Card (BSC) and identified key business processes.

In the five year period, 1995-2000, business processes like market development, order generation and fulfillment, and supply chain processes, having significant impact on customers were completely redesigned with the help of some world-class consultants. Introduction of ERP systems and workflow based processes were developed in-house for providing the information backbone to the newly designed processes. Customer intimacy and operational excellence have been aided by these systems. Benchmarking not only the products but also the processes resulted in superior design of processes, products and services.

Total operational performance (TOP) is an accelerated change management initiative introduced in operations in the year 1998. This initiative has changed the definition of constraints and resourcefulness for Tata Steel. Cycles of TOP waves have compressed the costs by 5-10% since then. The organisation's strategic intent of becoming the lowest cost producer of steel was driven by its benchmarking effort with POSCO's cost of hot rolled coils. TOP became the vehicle to accelerate achievement of this distinction.

In its search for relevant tools and concepts to address different improvement needs, several new concepts have been brought into practice. Tools now used for improvements range from the loss structure and 5S of total productive maintenance (TPM) to DMAIC (design, measure, analyze, improve, and control) and dash board of six sigma. Benchmarking of best practices, sharing knowledge through interactive knowledge management sites and e-learning have all been useful in kindling innovation and creativity.

In right sizing the organization, the company has taken pioneering initiatives through a win-win approach with the trade union leadership and succeeded in achieving their goals. "Performance Ethic Program""(PEP) is under

implementation to improve leadership skills of officers and ensure right man on the right job. There are several initiatives in place to involve all officers and most employees in improvement projects.

In order to reduce cost, many initiatives are in place to optimize productivity, enhance asset utilization and technology upgradation.

Use of information technology is extensively made to manage business strategies. Use of IT in knowledge management is growing in maturity and can be expanded. As non-computerized databases are being shifted to KM site, ownership of knowledge communities to ensure timely updating and appropriate integration with initiatives would be helpful.

Several production processes have been improved over the years to achieve cost leadership status. Through the use of Information Technology and ERP packages, three processes-order generation, market development and supply chain have been substantially improved

Production of TISCO during the last two years are highlighted in the table given below: -

	Unit	2000-2001	2001-2002	Apr. –Dec. 2002
Crude Steel	Million tonnes	3.57	3.75	2.992
Saleable Steel	Million tonnes	3.43	3.64	2.872
Finished Steel	Million tonnes	2.78	3.10	2.478
A-F Productivity	T/m3/day	1.41	1.55	1.7
G Furnace Product	T/m3/day	2.28	2.17	2.03
Coke Rate	Kg/thm	559	527	531
Sp. Energy Consumption	Gkcal/tcs	7.4	7.26	7.05

JINDAL VIJAYANAGAR STEEL LIMITED (JVSL)

Modern, technology driven, cost effective and environment friendly, JVSL is the state-of-the-art green field plant located at Torangallu' in Bellary District of Karnataka. The finished steel is manufactured through the revolutionary COREX ® iron making technology route; the first steel plant of its kind in India and the third in the world to do so.

Spread over 3,700 acres of land and located in the heart of the high-grade iron ore belt, the plant is within easy access of Bangalore and is well connected to the ports of Chennai and Goa. This locational advantage has helped it gain entry to the lucrative export market. With the current hot rolling capacity of 1.60 million tonnes per annum, JVSL is the largest industrial enterprise in the state of Karnataka.

JVSL is one of the new plants in the world to use oxygen in both iron and steel making. Corex, developed by Voest Alpine, Austria, is at the heart of JVSL's technological supremacy. The technology is based on usage of iron ore lumps, pellets and primarily non-coking coal; thereby eliminating the setting up of sintering and coke oven plants; the two most polluting units in steel making. Thus, the process not only offers competitive advantages but is also eco-friendly. More than 40% of the coal used in the process is available as export gas for the production of power, and also for in-plant heating.

JVSL enjoys total IT integration of the plant. All activities from raw material handling, stores, production and planning to customer order, shipping and invoicing are carried out through constant man-computer interface. Consistent quality control has ensured product quality and customer satisfaction. Proper selection, inspection and testing of raw materials and finished products and continuous monitoring of the production process are the norm at JVSL.

Systematic R&D efforts have rendered incremental improvements in the performance of the adopted modern technologies. In-house implementation of pressure Corex gas tapping and its utilisation in indurating furnace of the pellet plant and lime calcination plant has totally dispensed with bit compressors, saving electrical energy. The performance of melting shop has been excellent, surpassing the Indian records. The lining life of converter achieved is 3458 and overall refractory consumption is less than 9.0 kg per tonne of crude steel. The water consumption of the plant is approximately 3.5 metre cube per tonne of crude steel which is the lowest in the country and comparable with western norms. JVSL is a plant based on zero discharge concept from its plant boundary.

Integrated iron and steel production performance almost at the rated capacity is being achieved by about 1650 direct employees with approximately same number of outsourced support. Labour productivity at JVSL is the highest in the country.

JVSL has been accredited with ISO 9001:200, ISO 14001:1996 and OHSAS 18001:1999 for entire integrated operation. JVSL is the only steel plant to achieve this distinction.

JINDAL STEEL & POWER LTD. (JSPL)

Jindal Steel & Power Limited (JSPL) is an OP Jindal group company having its Corporate office at New Delhi and production facilities at Raigarh and Raipur, both in the state of Chattisgarh. Raigarh, the principal production facility of the company has is rotary kilns with a combined capacity of 6,50,000 tonnes per annum; making it the largest coal-based sponge iron manufacturing capability in the world. Power generation is another focus area based on efficient energy utilisation of washery rejects, char, pond fines and flue gases. The

company has a capacity to produce 150 MW. The company also has steel melting facilities with a capacity of 400,000 tonnes per annum. The company also produces ferro chrome having a capacity of 30,000 tonnes per annum. In addition to the above, the company also has engineering fabrication and mild steel casting capacity of 30,000 tonnes per annum facilities at Raipur, and captive mining rights for coal in Chattisgarh and iron ore in Orissa.

During the year ending March 31, 2002, the net turnover increased by 14% to Rs 648.36 crores while profit before tax increased by 10% to Rs 122.69 crores in comparison to the previous year. Nominated by the Economic Times as among the top ten emerging companies in the fiscal year 2000, JSPL is looking ahead after bagging the first prize in iron and steel sector (integrated steel plants) **"Energy conservation award"** in 2001, organised by Ministry of Power, Govt. of India and also the first prize in National quality competition in 2001 organised by Indian Institute of Metals.

The company with a view to reducing operational costs and increasing the steel making capacity; has successfully installed and commissioned 351 cubic meter mini blast furnace in April 2002 which has achieved a production level of 750 tonnes per day (Productivity more than 2t/m3/day) within a very short span of operation.

Among expansion projects, JSPL has set up a new coal washery of 2.5 million tonnes per annum capacity at the coalmine to treat high ash coal, which has augmented availability of required coal quantity and quality for sponge iron production.

During 2001-2002, sponge iron production went up to 5,61,526 tonnes (increase of 12% compared to previous year). Power generation also went up by 35% and ferro-chrome by about 15%. Steel melt shop consolidated its hold in new and highly competitive product areas of micro alloyed steels for special applications like high tensile structural steels for electrical transmission towers, forging quality steels, as per Indian / International standards.

In the power generation front, JSPL is one of India's most economical power producers and maintaining this as a major thrust area, a 1000 MW thermal power plant has been planned in Raigarh District. An MOU with the State Govt has been signed and preliminary work on this project has already commenced.

With a view to diversify its product mix and forward integrate its existing operations, the company is setting-up a Rail & Universal Beam Mill with an installed capacity of 5,50,000 tpa at Raigarh to cater to the growing demands of Railways and infrastructure industry. The rolling mill will be producing world's longest rail with 120 M finished length of superior quality rail and will have facility to deliver upto 480 M welded rail panels produced by latest flash butt welding plant for direct transportation to construction sites; offering substantial benefits to Railways. These rails will also be available for exports.

The structural capacity of the mill to produce universal beams, columns and U-type sheet piles opens a new era for designers, consultants and end-users providing better value for money and providing impetus to the infrastructure industry. Parallel flange beams and columns, will be produced for the first time in India, having inherent superiority in terms of strength, sectional efficiency, load bearing capacity and economy vis-à-vis conventional taper flange beams currently produced.

The new steel melt shop under construction adjacent to the Rail and Universal Beam Mill will produce rounds / booms / beam blanks through a modern 2-strand bloom-cum-beam blank-cum-round caster, designed and supplied by VAI, Austria. The continuous caster will produce rail blooms and beam blanks for production of long rails and parallel flange beams and columns respectively. Round blooms, for production of seamless tubes and pipes, will continue with further improvement in quality.

JSPL has entered into a Technical Collaboration Agreement with NKK of Japan covering **"know-how"** transfer for production of superior quality rails and rolled parallel flange beams, columns and U-type sheet piles of larger sizes (for the first time in India) from the upcoming Rail and Universal Beam Mill at Raigarh. The project is at an advanced stage of implementation.

The finished products from this state-of-the-art mill with continuous on-line inspection for quality control and quality assurance will be conforming to Indian as well as various international specifications. The upgraded Rail and Universal Beam Mill is a state-of-the-art mill suitable for rolling and finishing 120 meters long rails, parallel flange beams and columns in medium and heavy sizes and sheet piles with greater precision of dimension tolerance, optimum management of the production cycle in terms of reducing rolling time, temperature and improvement of surface condition; besides continuous on-line inspection for quality control and quality assurance.

JSPL's integrated steel works at Raigarh is certified by BSI-London for Quality BS EN 9002:2000 and BS EN 14001:1996 for Environmental Management System respectively. This process involves all levels of company activities, in accordance with internationally recognized standardization structures and certification requirements.

ISPAT INDUSTRIES LTD. (IIL)

Ispat Industries Ltd. (IIL) with its associated companies has set up one of the largest integrated steel plants (ISP) in the private sector in India at Dolvi in Raigad District, Maharashtra with a capacity to manufacture 3 million tonnes per annum of hot rolled steel coils (HRC) with a total investment of approx. Rs. 10,000 crores. They are also manufacturing sponge iron and pig iron in their Dolvi Complex.

The integrated steel plant is using the electric arc furnace route to produce steel by using modern twin shell electric arc furnace and CONARC process. In this project, IIL have uniquely combined the use of hot metal and DRI (sponge iron) in the electric arc furnace for production of liquid steel for the first time in India. The complex also envisages a blast furnace and a DRI plant together with electric arc furnaces and a captive power plant. For casting and rolling of liquid steel, IIL have the state-of-the-art technology called compact strip production (CSP) process, which is installed for the first time in India and which produces high quality and specifically very thin grades of HRC. IIL's products are well accepted in international markets. The company has developed special skills in providing micro-alloyed material, which finds better application in the areas of drawing and forming (a special requirement for automobile sector).

Installed capacity and production of various products are as under: -

(In tonnes)

Product Name	Installed Capacity	1999-2000	2001-02	2002-03 (Apr.-Dec.02
Direct Reduced Iron	12,00,000	11,62,957	9,61,125	7,30,051
Hot Rolled Coils	15,00,000	7,88,864	8,70,422	8,80,784
HR Skinpass	0	15,467	2,696	1,100
Cold Rolled Carbon Steel Sheets/Coils	3,00,000	2,69,499	2,48,371	2,37,838
Galvanised Coils/Sheets	2,25,000	1,95,154	1,99,379	2,23,286
PVC Coated Sheets	50,000	19,084	21,767	28,719

Productionwise Performance

Sponge Iron Plant

The sponge iron plant witnessed a production of 7,30,051 metric tonnes during the period April – December, 2002 and sales of 4,03,500 metric tonnes in the domestic segment excluding captive consumption. DRI production during the period was affected due to maintenance shut down and availability of gas. However, with increased production of hot metal from Ispat Metalics, about 4 lakh tonnes was available for sales. This was possible due to the changed manufacturing strategy wherein the usage of hot metal in the charge mix was increased for production of HR coils, thereby rendering sponge iron available for sale. However, the production levels had to be pegged at lower levels due to lower availability of natural gas throughout the year as well as the vagaries of the input feed mix.

HOT STRIP MILL

The year witnessed consolidation of operations in the Hot Strip Mill complex. The focus was clearly on reducing the cost of production to remain competitive in a fluctuating steel demand scenario. Ispat Industries Ltd. rose to the occasion by taking a significant step viz. production of steel by using up to 100% hot metal in the charge mix, thereby eliminating power usage in steel making. The steel making process was stabilised with 85% hot metal and 15% sponge iron as chiller in both shells with zero consumption of power in the electric furnace for melting.

The year also witnessed development of following special grades viz. stainless steel of FS430N grade and ferritic steel of CR01 A&B grades as well as extra lower "sulphur" grades like AP25LX60 and PP60 FM (sour gas applications). Further efforts would be taken to build on these developments and focus on niche segments. During the period, production of HR coils 8,80,783 metric tonnes was achieved, which is more than the production during 12 months of year 2001-02. Domestic sales of HR Coils excluding captive consumption during the period was 6,30,000 metric tonnes

COLD ROLLING AND COATING COMPLEX

The cold rolling and coating complex registered all round improved volumes performance during the period. The cold rolling mill complex registered production increase of over 24% and recorded a production of 2,37,838 metric tonnes as against last year's 1,90,802 metric tonnes. The galvanised steel production rose to 2,23,287 metric tonnes, an increase of 48% over last year's 1,50,433 metric tonnes. In furtherance of the focus on increasing colour coated steel production, the year saw a production of 28,716 metric tonnes of PVC coated steel, an increase of 81.3% over last year's 15,840 metric tonnes.

The year saw key imperatives being implemented in the complex, which included: -

- Increase in width capability from 1000 mm to 1250 mm in both the galvanising lines – thereby enabling exploitation of export market of GP.
- Conversion of oil fired lead-zinc bath into induction heated pure zinc bath in galvanising line, thereby enabling high-class quality production of galvanised steel.
- Development of high strength, low alloy/micro alloyed steel for auto body application.
- Rolling of high strength steel for galvanising and colour coating application.
- Increase in width capability of colour coating line from 1000 mm to 1250 mm.
- Development of high tensile steel of 550-mpa grades for structural application.

- Improvement in surface finish of galvanised substrate or colour coating by increasing load from 35 metric tonnes to 120 metric tonnes in the online of high skin pass mills by way of in-house modification.

On the export front, the company has put up an impressive performance and notched up resounding growth. The exports in various segments were as under: -

Segment	Quantity 2001-02 (Apr.Dec.) Metric tonnes	Quantity 2002-03 (Apr.Dec.) Metric tonnes	Growth (%)
Hot Rolled Coil	28,568	1,10,711	388
Galvanised Steel Sheet	60,901	1,38,184	227
Cold Rolled Carbon Steel	13,611	Nil	-
PVC Coated Steel	3,123	10,242	328

Company strategy in the wake of overall industry scenario and outlook

As outlook for the steel industry is buoyant, the strategy of the company would be three pronged: -

- To exploit the affordable conditions witnessed in the export markets for downstream value added products such as galvanised and colour coated steel,
- To maximise sale of hot rolled coils in all remunerative segments with accent on volume production and
- To consolidate presence in the metallics segment by focusing on enhanced sale of sponge iron.

IIL is well aware of the threats prevailing in the world steel market such as anti dumping law, overproduction, cyclical demand of steel etc. and is capable of forming strategy to meet such challenges. The company is diversifying its market portfolio by increasing presence in different parts of international market.

ESSAR STEEL LIMITED (ESL)

Essar steel has strived for excellence in every facet of business. The company has well equipped laboratory facilities with a highly qualified team of engineers and technologists who are conducting developmental work continuously. The modifications carried out have benefited in terms of increase in productivity, reduction in cost and improvement in quality of the product.

The plant-wise developmental works carried out are as follows:

Hot Briquetted Iron

(i) **Reformer Expansion:** Reformer is the place where reforming reactions take place to generate CO & H2 for reduction of oxides. Two extra bays of reformer tubes have been added, increasing reforming capacity by 16%. Higher volume means, higher volume of reformed gas available for reduction and hence higher capacity.

(ii) **Module Throughput Enhancement:** Increasing the reduction volume by reducing the refractory liner thickness. The diameter increased by 0.15m, resulted in reduction of volume rise by 6%. Modification effected in top gas off-take design to increase the reduction volume.

(iii) **Oxygen Injection:** The rate of reaction is directly proportional to the temperature. The bustle gas temperature is increased by injecting Oxygen. To avoid the clustering of the oxides, lime coating is done. ESL has observed 5% reduction in NG consumption and 10% increase in productivity.

(iv) **Top gas fuel chiller:** Reduces the moisture in top gas fuel and thereby reduces volumetric load on flue gas fan. Provides higher calorific value of top gas as temperature drops by 5 to 10 degree C.

(v) **Hot Cone Bleed:** Typically, in a HBI plant the reformed gas plus natural gas entered in furnace for carburizing reaction reduces the burden temperature which directly affects the productivity. In hot cone bleed system, the cool gas after carburizing reaction, is removed from the furnace before it reaches to burden, which helps in maintaining high burden temperature; thus improving furnace performance.

STEEL MELT SHOP & CASTER

(i) **Hot DRI Feeding:** This is one of the major achievements of Essar steel. Since implementation of this project, the company has been continuously improving the quantity of HDRI feeding in EAF, as this reduces the power consumption and arc time.

(ii) **Modular Lance for Oxygen Injection**: In-house design, manufacturing and customizing of modular lance for oxygen injection. The unique design of the nozzle helps in deep penetration of Oxygen into the bath; thus improving the efficiency.

(iii) **Mixed Grade Casting:** The device is developed in-house. This aids in casting grades which are not compatible otherwise; thus improving the heats/sequence.

Hot Strip Mill

(i) **De-scaling System Up-gradation:** New nozzle with built in filter and stabilizer were installed in the de-scale headers at all the primary and secondary de-scale stations. This change not only reduced scale cleaning requirement but also reduced the water consumption for the same impact value thus reducing loads on the de-scale pumps thereby enabling the system to run at higher operating pressure.

(ii) **Hydraulic pipe modification:** The hydraulic pipelines close to equipments which were exposed to moisture and subsequent rusting were converted to stainless steel design. This resulted in reduction of oil consumption by 50%.

(ii) Successful commercial rolling of 1.2 mm thickness, mill design capacity is 1.6 mm. This material is being used as substitute to “Cold Rolled” material.

(iii) Successful HSLA rolling min 1.37 x 1220.

(iv) Successful ferritic rolling in both low carbon and silicon grades.

(v) Successful rolling of interstitial free steels.

Quality Improvements:

Based on the internal quality inspection and the feedback from the customers, numerous corrective actions have been implemented, which are as follows:

(i) Migrating from forged pinch rolls to volume hardened pinch rolls has reduced the metal pickup on the down coiler pinch rolls.

(ii) Runout table coupling and motor design change has reflected in higher availability of ROT rolls in running condition.

(iii) De-scaler system’s operating nozzle and valves are upgraded to ensure higher de-scaler reliability.

(iv) Maintaining minimum de-scaling pressure of 180 bar and strict monitoring, across the length of the coil during the process of rolling of the low “Carbon” grades.

(v) Use of roll lubrication for all the coils to reduce the roll wear.

(vi) To avoid the entrapment of non-metallic particles during casting, the mold turbulence is reduced by using modified SEN.

Product Development:

Essar Steel reached newer landmark in the field of in-house product development both for domestic as well as overseas markets. Major products developed are listed below:

(i) One of the major developmental work carried out is in API segment. Successfully developed and supplied hot rolled coils of API 5L and API 5CT specification for manufacture of pipes and tubes for the oil and gas industries.

(ii) The company has developed and produced hot rolled coils in various grades ranging from Gr. 'B' to X-70. These had been made possible with optimization of chemical composition of steel for each grade combined with modified thermo-mechanical rolling practice with controlled cooling.

(iii) Developed and supplied high value-added sour gas quality steel in API 5L X-52 (in thickness up to 17.0mm) and API 5L X-60 (in thickness up to 12.0mm).

(iv) Successfully developed IF steel through DC arc route. Trials are on for developing dent resistant IF steel.

(v) Non-grained oriented high silicon steels with %Si=1.50-1.70 was successfully developed, for making lamination for motors, transformers.

NEELACHAL ISPAT NIGAM LIMITED (NINL)

Neelachal Ispat Nigam Ltd.(NINL) is a 1.1. million tonnes per annum capacity iron and steel plant located at Dubari, Orissa.

Production

Since its commissioning, the plant has produced 26,500 tonnes of pig iron and 11,300 tonnes of granulated slag up to March 2002. Steel melt shop has not yet been set up.

During the current fiscal year 2002-03, the plant has produced about 2,47,000 tonnes of pig iron and about 82,000 tonnes of granulated slag up to 31st December 2002. MMTC has exported about 1,30,000 metric tonnes of basic grade pig iron produced by NINL to South East Asia through Paradeep Port till December 2002. MMTC is targeting to export additional one lakh metric tonnes of pig iron by the end of March 2003.

NINL has also established itself as a major player in the domestic market with substantial sales of its products to foundry and large institutional customers including 40,000 metric tonnes of pig iron to Tata Iron & Steel Company (TISCO).

About 75,000 metric tonnes of granulated slag has been sold in domestic market to several cement plants including A.C.C. during April-December, 2002.

KONARK MET COKE LIMITED (KMCL)

KMCL has coke plants with capacity of 0.8 million tonnes per annum. KMCL has also commissioned its power plant of 1 X 19.25 MW steam turbine generator (STG-1) and is supplying uninterrupted power to NINL for blast furnace operations. Two steam boilers have been commissioned and are supplying superheated steam to NINL for operations of steam turbo blower besides power generation. 2nd unit of 19.25 MW steam turbine generator (STG-2) is ready for trial run and commissioning. Further 1 X 24 MW gas turbine generator (GTG) will be commissioned along with coke oven battery. The heating of coke oven battery is scheduled in March 2003 and coal charging and commissioning in June 2003.

MMTC besides importing coking coal for the operations, will be responsible for sale of the finished goods and by-products, like low ash metallurgical (LAM) coke (in excess of requirement of NINL) nut and breeze coke, crude tar and ammonium sulphate in domestic and overseas markets.

SUB SECTORWISE PERFORMANCE

1. Electric Arc Furnace Units

(i) Status

	Number	Capacity (in tonnes)
Commissioned Units	188	1,27,77,960
Closed Units	153	60,50,000
Working Units	35	67,27,960

(ii) Production

(In `000 tonnes)

Category	1999-2000	2000-01	2001-02	2002-03 (Apr.-Dec,2002)
Mild Steel	932.5	1,162.6	965.2	1,138.4
Medium/High Carbon Steel	1,313.8	1,386.3	1,025.4	651.5
Alloy Steel	966.8	740.6	689.2	615.3
Stainless Steel	382.1	455.2	471.5	416.3
Others	108.9	165.8	171.4	143.2
Total Reported	3,704.1	3,910.5	3,322.7	2,964.7
Total Estimated	931.2	924.1	960.0	720.0
Grand Total	4,635.3	4,834.6	4,282.7	3,684.7*

* Excluding casting.

2. HOT ROLLED LONG PRODUCTS UNITS

(i) Status

	Number	Capacity (in tonnes)
Commissioned Units	1261	2,44,78,689
Closed Units	472	91,50,209
Working Units	789	1,53,28,480

(ii) Production

Production of hot rolled long product manufacturing units which are reporting their production to the office of the Development Commissioner for Iron & Steel, during the last three years and current year is as under: -

(In `000 tonnes)

Category	1999-2000	2000-01	2001-02	2002-03(Apr.- Dec., 2002)
Bars/Rods (Incl. Squares)	2,257.7	2,227.0	2,403.7	1,883.2
Wire Rods		774.1787.8	776.2	543.4
Structural	877.9	875.2	929,3	695.3
Hoops	14.1	7.7	7.6	15.2
Special Sections	239.5	233.4	214.0	178.1
Slabs/Plates	534.5	570.6	605.5	470.5
Total Reported	4,697.8	4,701.7	4,936.3	3,785.7
Total Estimated	2,072.5	1,692.7	1,730.1	1,357.4
Grand Total	6,770.3	6,394.4	6,666.4	5,143.1

3. STEEL WIRE DRAWING UNITS

(i) Status

	Number	Capacity (in tonnes)
Commissioned Units	94	12,07,205
Closed Units	61	7,60,367
Working Units	33	4,46,838

(ii) Production

Production of Steel Wire Drawing Units, which are reporting their production to the office of the Development Commissioner for Iron & Steel, during the last three years and current year is as under: -

(In `000 tonnes)

Category	1999-2000	2000-01	2001-02	2002-03 (Apr.-Dec.,2002)
Mild Steel	118.3	117.9	115.8	107.1
Medium/High Carbon Steel	210.9	196.3	200.7	117.3
Alloy Steel	10.2	11.1	10.2	9.9
Stainless Steel	11.4	11.0	10.7	8.2
Others	6.6	10.7	21.0	28.5
Total Reported	357.4	347.0	358.5	271.0
Total Estimated	32.8	171.6	25.5	2.5
Grand Total	390.2	518.6	384.0	273.5

4. HOT ROLLED STEEL SHEETS/STRIPS/PLATES UNITS

(i) Status

	Number	Capacity (in tonnes)
Commissioned Units	13	66,27,500
Closed Units	6	5,42,500
Working Units	7	60,85,000

(ii) Production

Production of Hot Rolled Steel Sheets/Strips Units which are reporting their production to the office of the Development Commissioner for Iron & Steel, during the last three years is given below: -

(In `000 tonnes)

Category	1999-2000	2000-01	2001-02	2002-03(Apr.-Dec., 2002)
Hot Rolled Steel Sheets/Strips	3,897.2	3,843.7	3,963.8	3,489.7
Plates	279.8	308.5	246.2	117.2
Total Reported	**4,177.0**	**4,152.2**	**4,210.0**	**3,606.9**

5. COLD ROLLED STEEL SHEETS/STRIPS UNITS

(i) Status

	Number	Capacity (in tonnes)
Commissioned Units	85	45,91,521
Closed Units	31	6,99,491
Working Units	54	38,92,030

(ii) Production

Production of Cold Rolled Steel Sheets/Strips Units, which are reporting their production to the Office of the Development Commissioner for Iron & Steel, during the last three years and current year is as under: -

(In `000 tonnes)

Category	1999-2000	2000-01	2001-02	2002-03 (Apr.-Dec., 2002)
Mild Steel	2,417.4	2,418.7	2,623.2	2,128.1
Medium Carbon Steel	106.1	413.9	144.2	57.2
High Carbon Steel	-	--	---	---
Alloy Steels	0.7	0.3	0.4	0.4
Stainless Steel	33.7	69.1	89.2	124.1
Others	163.0	151.4	235.3	91.7
Total Reported	2,720.9	3,053.4	3,092.2	2,401.5
Total Estimated	212.1	81.4	172.7	104.6
Grand Total	**2,933.0**	**3,134.8**	**3,264.9**	**2,506.1**

6.GP/GC, PVC/VINYLE COATED SHEETS/STRIPS UNITS

(i) Status

	Number	Capacity (in tonnes)
Commissioned Units	22	22,03,250
Closed Units	3	84,500
Working Units	19	21,18,750

(ii) Production

Production of GP/GC Sheets/Strips Units, which are reporting their production to the office of the Development Commissioner for Iron & Steel, during the last three years and current year is given below: -

(In `000 tonnes)

Category	1999-2000	2000-01	2001-02	2002-03(Apr.-Dec., 2002)
GP/GC Sheets/Strips (including colour coated)	1,144.1	1,500.4	1,835.7	1,369.84
Total Reported	**1,144.1**	**1,500.4**	**1,835.7**	**1,369.84**

7. TIN PLATE UNITS

(i) Status

	Number	Capacity (in tonnes)
Commissioned Units	3	1,51,638
Closed Units	1	60,000
Working Units	2	91,638

(ii) Production

Production of Tin Plate Units, which are reporting their production to the office of the Development Commissioner for Iron & Steel, during the last three years and current year is as under: -

(In `000 tonnes)

Category	1999-2000	2000-01	2001-02	2002-03 (Apr.-Dec., 2002)
Oil Can Size	92.9	102.0	102.4	72.1
Non Oil Can Size	-	-	-	-
Total Reported	92.9	102.0	102.4	72.1

PIG IRON INDUSTRY:

Pig Iron is one of the basic raw materials required by the foundry and casting industry for manufacture of various types of castings for the engineering sector. Post liberalization, considerable interest was shown by a large number of entrepreneurs, for setting up mini blast furnaces for production of hot metal/pig iron. Commissioned pig iron units are mostly of stand alone type. Two units namely, M/s. Usha Martin Industries Ltd. and M/s. Jindal Steel & Power Ltd. have integrated the mini blast furnace(MBF) and are using the hot metal in the charge-mix directly for manufacture of steel. One unit each in Karnataka (M/s. Hospet Steel, a Joint Venture of Kalyani & Mukand) and Tamilnadu (M/s. Southern Iron & Steel Company Ltd.) has integrated their MBF with energy optimizing furnace (EOF) for manufacture of steel. The excess hot metal produced by them supplements the pig iron production.

Besides MBF, a COREX Plant (alternative to conventional MBF/BF) along with down-stream steel making through basic oxygen furnace (BOF) which has been commissioned in Karnataka by Jindal Vijaynagar Steel Ltd., also supplements the production of pig iron. In addition, Ispat Metallics (India) Ltd. has set up a large blast furnace to produce 1.8 million tonnes per annum hot metal/pig iron. The excess hot metal after meeting the requirement of their parent company (Ispat Industries Ltd.) for manufacture of steel will be available as pig iron for sale. M/s. Neelachal Ispat Nigam Ltd. has also commissioned a blast furnace and have started production of pig iron.

The gross pig iron manufacturing capacity in the secondary sector as on September 2002 is approx. 4.833 million tonnes. Total production of pig iron in the country during 2001-2002 was 4.07 million tonnes which was approximately 20.06% higher than the previous year's production of 3.39 million tonnes. The contribution of private/secondary sector units adopting mini blast furnace route in the overall production of pig iron in the country continued to increase during the year from 71.6% in 2000-2001 to 75% in 2001-2002. These units have also been significantly contributing to the availability of the special grade pig iron including low sulphar and low phosphorus varieties.

The Sector/company-wise production of pig iron during the last 5 years are given in the following table:

(In million tonnes)

Sl. No.	Name of the unit	1998-99	1999-2000	2000-01	2001-02	2002-03 (Apr-Dec. 2002)
1.	SAIL	0.74	0.60	0.367	0.354	0.223
2.	IISCO	0.34	0.38	0.339	0.288	0.204
3.	RINL	0.27	0.25	0.258	0.374	0.384

4.	Total Main Producers	1.35 (45%)	1.23 (39%)	0.964 (28%)	1.016 (25%)	0.811 (20.87%)
5.	Private/ Secondary Producers	1.64 (55%)	1.95 (61%)	2.430 (72%)	3.050 (75%)	3.075 (79.13%)
	Grand Total	**2.99**	**3.18**	**3.394**	**4.066**	**3.886**

NB: Figures within brackets indicate the percentage contribution by the respective sectors.

SPONGE IRON UNITS

The growth of sponge iron especially during the last 5/6 years, both in terms of capacity and production, has been substantial. The installed capacity of sponge iron increased from 1.52 million tonnes per annum in 1990-1991 to 7.034 million tonnes per annum in 2001-2002. Production has increased from 0.9 million tonnes in 1990-1991 to 5.444 million tonnes in 2001-2002. Presently (as on 31.12.2002), there are 53 sponge iron units installed in the country having a capacity of 7.046 million tonnes per annum. Out of this, there are 50 coal based units with a capacity of 3.286 million tonnes per annum. 5 (five) coal based units covering a capacity of 0.366 million tonnes per annum are lying closed. There are 3 (three) gas based units covering a capacity of 3.760 million tonnes per annum.

The production of sponge iron units, which are reporting their production to the Office of the Development Commissioner for Iron & Steel, for the last three years and current year is given as under: -

(In million tonnes)

	1999-2000	2000-2001	2001-2002	2002-2003 (upto Dec. 02) (Provisional)
Total Reported	**5.328**	**5.484**	**5.444**	**4.541**