

IRON AND STEEL INDUSTRY IN INDIA

OVERVIEW

1.1 Background

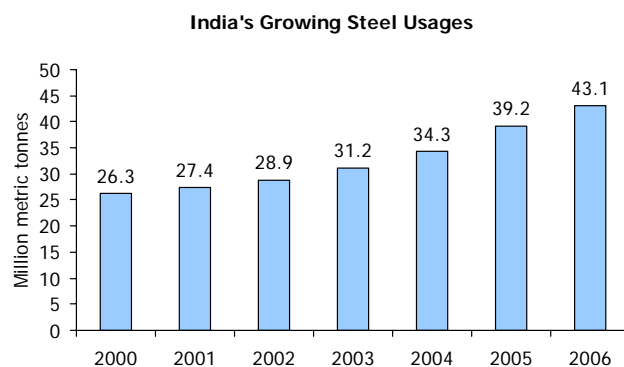
The Indian iron and steel industry is nearly a century old, with Tata Iron & Steel Co (Tata Steel) as the first integrated steel plant to be set up in 1907. It was the first core sector to be completely freed from the licensing regime (in 1990-91) and the pricing and distribution controls. The steel industry is expanding worldwide. For a number of years it has been benefiting from the exceptionally buoyant Asian economies (mainly India and China). The economic modernization processes in these countries are driving the sharp rise in demand for steel.

The New Industrial policy adopted by the Government of India has opened up the iron and steel sector for private investment by removing it from the list of industries reserved for public sector and exempting it from compulsory licensing. Imports of foreign technology as well as foreign direct investment are freely permitted up to certain limits under an automatic route. This, along with the other initiatives taken by the Government has given a definite impetus for entry, participation and growth of the private sector in the steel industry. While the existing units are being modernized/expanded, a large number of new/greenfield steel plants have also come up in different parts of the country based on modern, cost effective, state-of-the-art technologies.

Soaring demand by sectors like infrastructure, real estate and automobiles, at home and abroad, has put India's steel industry on the world map. Dominating the Indian horizon is steel giant Tata Steel, whose takeover of the UK-Dutch steel company Corus is the country's biggest buyout. Meanwhile, the LN Mittal-owned Mittal Steel acquired French steel company Arcelor to create the world's number one steel company, Arcelor Mittal; and Korean steel giant POSCO is pumping money into mines and steel plants in Orissa to emerge as one of the biggest steel plants in the state.

1.2 Consumption

Already, India's consumption of stainless steel is much higher at 14 per cent, compared to the global consumption of six per cent in the last 15 years. Domestic consumption of finished (carbon) steel is on the rise, driven by a boom in the automobile sector and a nation-wide thrust on infrastructure and real estate.

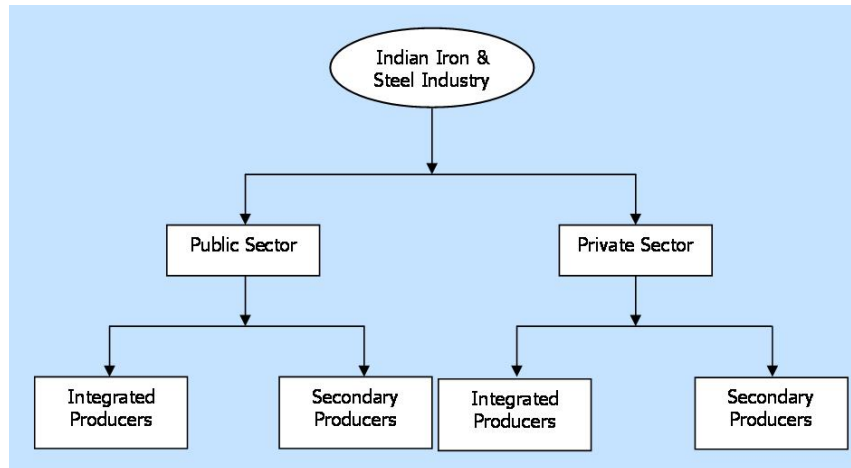


Source: International Iron and Steel Institute

During April and October 2005-06, domestic consumption of steel stood at 21.25 MT as compared to 19.53 MT in the corresponding period of the previous year.

1.3 Industry Structure

Indian Iron and steel Industry can be divided into two main sectors **Public sector and Private sector**. Further on the basis of routes of production, the Indian steel industry can be divided into two types of producers.



1.3.1 Integrated producers

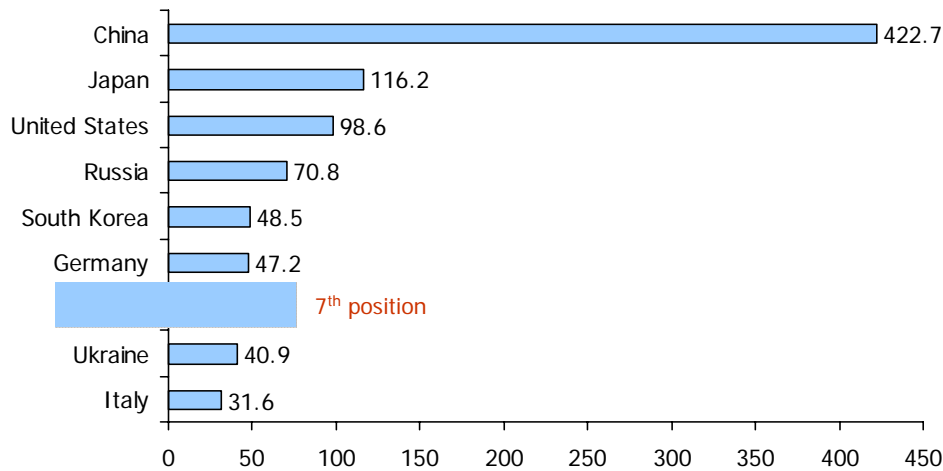
Those that convert iron ore into steel. There are three major integrated steel players in India, namely Steel Authority of India Limited (SAIL), Tata Iron and Steel Company Limited (TISCO) and Rashtriya Ispat Nigam Limited (RINL).

1.3.2 Secondary producers

These are the mini steel plants (MSPs), which make steel by melting scrap or sponge iron or a mixture of the two. Essar Steel, Ispat Industries and Lloyds steel are the largest producers of steel through the secondary route.

1.4 Production Scenario

The International Iron and Steel Institute (IISI) ranked India as the seventh largest steel producer in the world with an overall production of about 44 million tonne (MT) in 2006.

Major steel-producing countries 2006

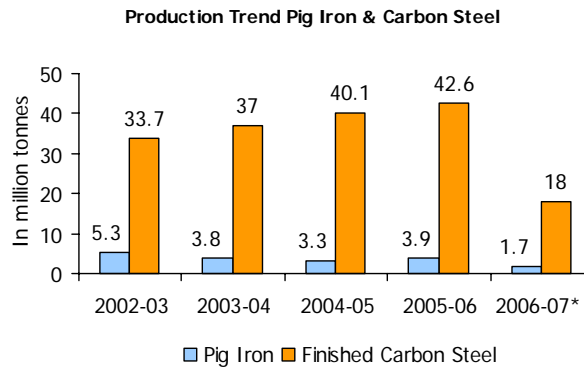
*In million metric tones
Source: International Iron and Steel Institute*

Apparent worldwide steel demand is forecast to grow to between 1,040 and 1,053 MT in 2006 from a total of 972 MT in 2004. This is a growth of 4-5 per cent over the two-year period. However, according to IISI, the cost of raw materials and energy was to continue to represent a major challenge for the world's steel industry.

Higher production of value-added products, capacity expansion, upgradation of production process achieving cost effective production in an environment friendly manner, have been the major thrust areas of the Indian Iron and steel producers in the recent times. After liberalization, there have been no shortages of iron and steel materials in the country.

1.4.1 Production of Carbon Steel

The total production of finished carbon steel in the country has been 42.636 million tonnes in 2005-06 as compared to 29.77 million tonnes in 2000-01, indicating an average increase of 57 per cent. The high share of the secondary sector in finished steel production is largely due to substantial supplies of semis, the basic feed material from the main producers for conversion to needed shapes by rolling.



Source: Joint Plant Committee
** (April-Aug' 06) Provisional Estimates*

Steel production during April 2006-February 2007 grew 10.1 per cent at 44.3 MT as against 40.237 MT in the corresponding period of previous fiscal. Export of finished carbon steel also increased 9.3 per cent during this period -- rising from 3.934 MT to 4.300 MT.

1.4.2 Pig Iron Production

The total production of Pig Iron was 3.9 million tonnes in 2005-06 as compared to 3.11 million tonnes in 2000-01 registering an increase of 148.18 per cent during the considered period. Earlier Pig Iron was produced primarily by the integrated steel plant of SAIL and RINL. Of late, the share of stand-alone pig iron units has increased significantly.

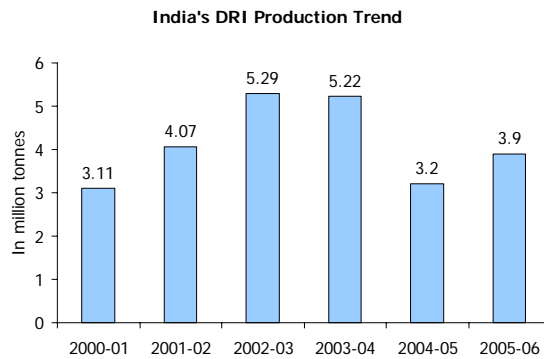
1.4.3 Production of Direct Reduced Iron (DRI)

Direct reduced iron (DRI) is produced from iron ore powder through heating and chemical reduction by natural gas.

While this is in general a more expensive process than reducing the ore in a blast furnace, there are several factors which can make it economical:

- Direct reduced iron is richer in iron than pig iron, 97% pure iron as opposed to about 93% for molten pig iron, and an excellent feedstock for the electric furnaces used by mini mills, allowing them to use lower grades of scrap for the rest of the charge.
- The direct reduction process uses powdered ore, avoiding the sintering process otherwise necessary to use this ore in a blast furnace.
- The direct reduction process can use natural gas contaminated with inert gases, avoiding the need to remove these gases for other use.
- Supplies of powdered ore and raw natural gas are both available in areas such as Northern Australia, avoiding transport costs for the gas.

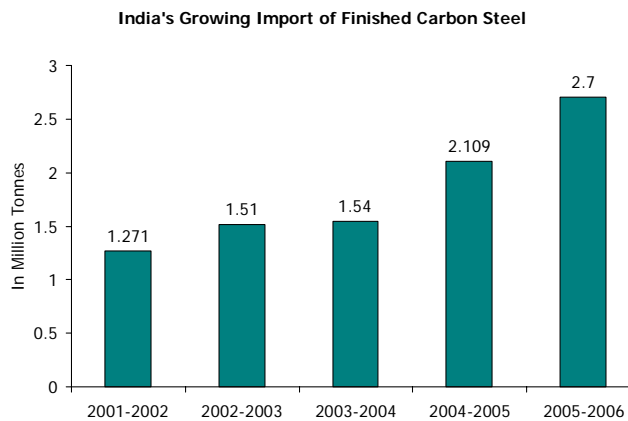
The production of DRI has increased from 1.31 million tonnes in 1991-92 to 5.403 million tonnes in 2001-02, registering an increase of nearly 4.12 times over the considered period.



India has emerged as the second largest producer of DRI in the world after Venezuela. In 2005-06, it was 12.5 million tones.

1.5 Imports of Iron and Steel

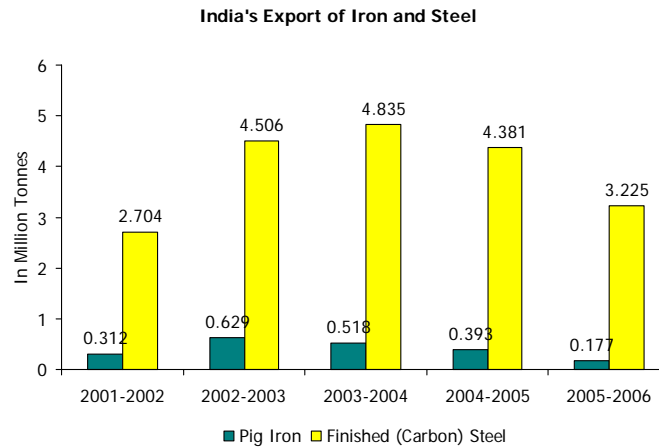
Iron & Steel products are freely importable as per the extant policy. In the past, India has been importing around 1.5 million tones annually. Advance Licensing Scheme allows duty free import of raw materials for exports.



Source: Joint Plant Committee, Government of India

1.6 Export of Iron and Steel

Similar to the Import policy for the Iron & Steel Products, the exports of these can also be done freely. Government introduced schemes under the Duty Entitlement Pass Book Scheme (DEPB) to facilitate exports. Under this scheme, exporters on the basis of notified entitlement rates, are granted due credits which entitles them to import duty free goods in return. However this DEPB scheme was temporarily suspended for a period from March 27, 2004 to July 12, 2004 for export of steel items. The Scheme was re-launched with the revised rates under the scheme. Figures for the Exports of during the last five years are given as follows:



Source: Joint Plant Committee, Government of India

1.7 Orissa Ahead

Dominating investments in steel and iron-ore mining is the state of Orissa. The state is endowed with large reserves of iron ore and convenient access to the sea through the port of Paradeep. Orissa has signed around 45 memoranda of understanding (MoU) for setting up steel capacities aggregating 60 million tonnes within the next few years. Leading the pack is Korean steel giant POSCO which is setting up a 12-mtpa steel plant near Paradeep in Jagatsinghpur. The project will have an integrated steel plant and will also develop infrastructure and iron ore mines. POSCO is also investing in a dedicated railway line from the steel plant to Paradeep port, an ideal point to ship out processed (carbon) steel to its main market, China. Other players who are setting up steel capacities in Orissa include Tata Steel, Jindal Stainless, Jindal Steel & Power, Bhushan Steel, Uttam Galva, Visa Steel and Welspun, among others.

According to the Ministry of Steel, the Government of India's target for the steel industry stands at 110 million metric tones by 2019-20, an achievable number if all the MoUs come through. Over 102 MoUs have been signed by different state governments, adding up to 103 million tonnes (MT) in steel capacity and investments of over US\$ 5,994 million. Out of the total investment commitment, about US\$ 17.9 billion forms the foreign direct investment component coming from two large steel projects: POSCO in Orissa and Mittal Steel in Jharkhand.

1. REGULATORY ENVIRONMENT

2.1 National Steel Policy 2005

The 2005 National Steel Policy (Government of India 2005) sets out the Indian Government's vision for the future of the steel industry. The central goal is the creation of an industry with 110 million tonnes of capacity and 100 million tonnes of production by 2019-20 — implying an average growth in production of nearly 7 per cent a year. The Indian Ministry of Steel estimates that achieving this goal will require an extra US\$65 billion in capital expenditure in addition to funds for technology upgrades at existing facilities.

The national policy seeks to facilitate the creation of additional capacity, removal of procedural and policy bottlenecks that affect the availability of production inputs, increased investment in research and development, and the creation of road, railway, and port infrastructure. The policy focuses on the domestic sector but also envisages a steel industry growing faster than domestic consumption, which will enable export opportunities to be realised. Current steel investment plans India's ready availability of iron ore and low cost labor contribute significantly to the cost competitiveness of producing steel in India. Notably, Tata Steel, the second largest steel producer in India, has been (with Posco) the world's lowest cost steel producer since 2001.

A comparative advantage for India's iron and steel industry is the ready domestic availability of significant reserves of high quality iron ore (a key raw material input to steel making), predominantly in the east of India. Although current steel production capacity is located in both the east (at products from large producers near iron ore supplies) and in the west (long products from smaller producers nearer large construction centres), most significant forthcoming developments are planned in the east to take advantage of low cost iron ore supply. Of particular interest to investors in the Indian iron and steel industry is the state of Orissa, where abundant natural resources and a large coastline make it an attractive target. It contains 25 per cent of India's iron ore reserves and 20 per cent of India's coal reserves. Consequently, Orissa is receiving an unprecedented inflow of investment in the [box 1](#):

2.2 Institutional and Policy Settings

Many government initiatives have been aimed at increasing investment in the steel industry in India, with the following issues being prominent in this context.

2.2.1 *Allowing Private Ownership and Foreign Investment*

Revised foreign investment rules for steel and other high priority industries have increased capital inflow, and ownership of crude steel operations is now split approximately evenly between private and public entities. Although profitable publicly owned companies (which include RINL and SAIL) appear unlikely to be privatised for political reasons (Gupta 2005), the Indian Government has sought to improve their performance by granting some of them

'Navratna' status, which affords them greater autonomy in investment, joint venture and commercial decisions.

2.2.2 Improving Intellectual Property Laws

The compulsory licensing regime, which still applies to some sectors, enables the Indian Government to force the granting of a technology licence if it deems that a patent has not provided a sufficient public benefit at a reasonable price. Its removal from the steel sector has provided greater security in intellectual property ownership and will facilitate the transfer of intellectual property to India and the development of indigenous technology solutions.

2.2.3 Deregulation of Pricing and Distribution of Iron and Steel

Steel was the first major industry to have pricing and distribution controls removed. Before these controls were removed, prices did not necessarily reflect production costs or product quality and regulation of product distribution prevented the industry from implementing efficient logistics.

2.2.4 Customs Policy

The government has significantly reduced the duty payable on inputs to steel production, on capital equipment and on finished steel products and has streamlined the associated approvals processes. The government administers schemes covering duties, licences and taxes to support firms that export steel, although some (for example, the Duty Entitlement Passbook Scheme and Duty Free Replenishment Certificate) have the net effect of remitting duty in excess of what was levied on the inputs to the production of the export goods (OECD 2006d) and are potentially subject to challenge in trade forums.

2.2.5 Special Economic Zones

The government introduced 'special economic zones' in June 2005, with the aim of creating internationally competitive regions in which exporting businesses can base their operations. Eight of these zones are functional or under construction and approval has been given for an additional eighteen zones. Previously existing 'export processing zones' have been converted to special economic zones. Steel plants operating in special economic zones are not subject to restrictive normal laws for the purpose of export operations and also receive some additional advantages including tax holidays, freedom to source inputs domestically or externally without any specific approval or duty payable, and sales tax reimbursement on domestic purchases. However, the proposed new economic zones will be relatively small, which may limit their effectiveness given that economies of scale are one of the key advantages of such zones

2.2.6 Special Investment Regions

The government has recently announced plans to set up 'special economic and investment regions' in six states, modeled on similar regions established in China (Pudong), the United States (Houston), and the Netherlands (Rotterdam). The regions are planned to support

further downstream processing, such as steel production, and encompass a number of special economic zones, with central and state governments providing world class infrastructure linkages to form a larger industrial region. This policy is at an early stage of development, but the key difference between special economic and investment regions and special economic zones appears to be that linking infrastructure will be built by the government in the former but is generally the responsibility of industry in the latter.

2. COMPETITION SCENARIO

3.1 Overview

From the biggest players like SAIL and Tata Steel, to mid-level players like Bhushan Steel and Welspun, the next four years are a time to ramp up. SAIL, a state-owned public sector undertaking and India's largest steel manufacturer, is planning to increase its annual production of 12 million tonnes per annum (mtpa) to 22.5 mtpa by 2011-12.

Tata Steel proposes to increase its steel making capacity to 33-34 mtpa by 2015, besides increasing the capacity of its Jamshedpur plant from 5 mtpa to 10 mtpa. In addition, the Tatas are planning to set up a 12-mtpa greenfield project in Jharkhand, a 6-mtpa plant in Orissa and another 5 mtpa capacity unit in Chhattisgarh.

According to London-based Iron and Steel Statistics Bureau (ISSB), India's Tata Steel, which recently acquired Anglo-Dutch firm Corus Group, has been ranked the world's sixth largest producer of the alloy with an output of 24 million MT. India-born business tycoon Lakshmi Mittal-controlled Arcelor Mittal has emerged as the largest producer with total production of 118 million metric tonnes in 2006, after Mittal Steel acquired European giant Arcelor SA for US\$ 38.3 billion in the industry's biggest ever transaction. Significantly, in the country ranking, India is ranked at the seventh position, with a total output of 44 million MT (up eight percent from previous year).

As India surges ahead in building infrastructure and catapulting its industry to new economic highs, investments in steel will pave the way ahead. Mittal Steel has announced a 12-mtpa greenfield steel project in Jharkhand and a 12-mtpa greenfield steel plant in Orissa.

3.2 Profile of Major Players

| | |
|------------------------------------|---|
| Name | Tata Steel |
| Year of Establishment | 1907 |
| Company Profile | Tata Steel is the world's 6th largest steel company with an existing annual crude steel capacity of 28 million tonnes. Asia's first integrated steel plant and India's largest integrated private sector steel company is now the world's second most geographically diversified steel producer. Tata Steel plans to grow and globalise through organic and inorganic routes. Its 5 million tonnes per annum (MTPA) Jamshedpur Works plans to double its capacity by 2010. The Company also has three greenfield steel projects in the states of Jharkhand, Orissa and Chhattisgarh and proposed steel making facilities in Vietnam and Bangladesh. |
| Sales/Revenues/Turnover | |
| Global Presence / Marketing | Tata Steel has operations in 24 countries and |

| | |
|----------------|---|
| Network | commercial presence in over 50 countries. |
|----------------|---|

3.2.1 *Tata Steel*

Tata Steel (earlier known as Tata Iron & Steel Company or Tisco) represents the country's single largest, integrated steel plant in the private sector. The company has a wide product portfolio, which includes flat and long steel, tubes, bearings, ferro-alloys and minerals as well as cargo handling services. While in terms of size, Tata Steel ranks 34th in the world; it was ranked first (for the second time) among 23 world class steel companies by World Steel Dynamics in June 2005. Recent overseas acquisitions are Tata Steel buying Anglo-Dutch firm Corus for over 12 billion dollars

With its plant located in Jamshedpur (Jharkhand) and captive iron ore mines and collieries in the vicinity, Tata Steel enjoys a distinct competitive advantage. The main plant at Jamshedpur manufactures 5 MTPA of flat and long products, while its recently acquired Singapore-based company, NatSteel Asia, manufactures 2 MTPA of steel across Singapore, China, Philippines, Malaysia and Vietnam.

3.2.2 Steel Authority of India Limited (SAIL)

Steel Authority of India Limited (SAIL) is a leading Public Sector Undertaking (PSU) in which the Government of India owns about 86 per cent of equity. It is a fully integrated iron and steel maker, producing both basic and special steels for domestic construction, engineering, power, railway, automotive and defence industries and for sale in export markets. It is ranked amongst the top ten public sector companies in India in terms of turnover.

They manufacture and sell a broad range of steel products, including hot and cold rolled sheets and coils, galvanised sheets, electrical sheets, structurals, railway products, plates, bars and rods, stainless steel and other alloy steels.

SAIL has five integrated plants and three special steel plants, located principally in the eastern and central regions of India and situated close to domestic sources of raw materials, including the Company's iron ore, limestone and dolomite mines. The company has the distinction of being India's largest producer of iron ore and of having the country's second largest mines network. This gives them a competitive edge in terms of captive availability of iron ore, limestone, and dolomite which are inputs for steel making.

3.2.3 Bhushan Power & Steel Ltd

Bhushan Power & Steel Ltd., an ISO 9002 certified company, is a merged entity of Bhushan Industries Ltd., Bhushan Metalics Ltd. and Decor Steel Ltd. Bhushan Steel has a turnover of more than USD 540 Million and is a leading manufacturer of Flat, Round and value added products in Steel.

Bhushan has 7 World class and state of art plants at Chandigarh, Derabassi, Kolkata and Orissa in India. A completely integrated plant is commissioned under Phase I in Orissa and Phase II is all set for take off. In Orissa plant, technology and equipments are procured from world-renowned Companies like Luirgi from Germany, ABB Ltd., SMS Demag, Siemens etc. It is selling its Value added range of products in Secondary Steel through a large distribution network in India (comprising more than 25 sales offices) and Abroad.

3.2.4 Jindal Steel & Power Limited (JSPL)

Jindal Steel and Power (JSPL), part of the US\$4 billion Jindal Organisation, has business interests in steel production, power generation, mining iron ore, coal and diamond exploration/mining. The current turnover of the company is over Rs. 30 billion and on a path of catalyzing economic development of the country through its contribution to the infrastructure sector. JSPL with its obsession for excellence, is increasing its portfolio of value-added products, bringing the world's best to India and making an international mark. Production Capabilities expanded to serve the infrastructure sector, catalysing economic, development and growth. JSPL has the integrated steel plant (as approved by Joint Plant Committee) at Raigarh in the state of Chhattisgarh, India. The facilities include world's largest coal-based Sponge Iron Plant with a capacity of 1.37 million TPA using ten indigenously developed rotary kilns. The company has achieved complete backward

integration with its captive iron & coal mines making it one of the lowest-cost producers of sponge iron. The steel making capacity has been expanded from 400,000TPA to 1.15 million TPA.

JSPL today is the largest private sector investor in Chhattisgarh with a total investment of Rs.100 billion. JSPL has recently signed an MoU with the State Government of Orissa to set up a 2 million tonne steel plant with an investment of Rs.13.5 billion which would be expanded to 6 million tonne and another MoU has been signed with the State Government of Jharkhand to set up a 5 million steel plant with an investment of Rs.120 billion.

3.2.5 *ESSAR Steel*

Essar Steel Limited (the "Company") is the flagship Company of the Essar Group and looks after the Group's interest in the steel business. The Company was incorporated in June 1976 under the name of Essar Construction Limited and was engaged primarily in core sector activities, including marine construction, pipeline laying, dredging and other port-related activities. In 1984, the Company ventured further into other core sectors mainly the field of exploration and development, drilling onshore and offshore oil and gas wells for Indian Public Sector oil exploration companies. In view of this the Company's name was then changed to Essar Offshore and Exploration Limited in May 1987.

In August 1987, the Company's name was changed to Essar Gujarat Limited, to reflect its highly diversified business interest. In 1988, the Company made an initial public offer for its shares, which are now listed on Bombay Stock Exchange, National Stock Exchange of India and 2 other Indian Stock Exchanges.

The Company diversified into the steel business in late 1980s with the purchase of an HBI manufacturing plant in Emden, Germany, which was dismantled and relocated to Hazira, on the west coast of India.

The HBI plant with a capacity of 0.88 MPTA was completed in March 1990 and commenced commercial production in August 1990.

As part of its business strategy of focusing on the iron and steel sector, the Company hived off its unrelated businesses to a series of different companies (each of which form a part of the Group and operate at arm's length relationship) - Offshore and energy operations were transferred to Essar Oil Limited in May 1992, Civil and mechanical construction businesses were transferred to Essar Projects Limited in March 1993.

The Company with a vertical integration program in mind, commenced construction of world-class state-of-the-art technology Hot Rolled (HR) sheets and coil plant in 1992. The plant commenced trial production in April 1995 and commenced commercial production in April 1996.

To reflect its business strategy of focusing on steel making operations, the name of the Company was changed from Essar Gujarat Limited to Essar Steel Limited in December 1995.

The Company operates the following facilities at Hazira, Gujarat State:

3.4 MMTPA gas based Hot Briquetted Iron (HBI) plant;

2.4 MMTPA Hot Rolled Coils (HRC) plant

The plant has requisite infrastructure like captive jetty, assured power supply, captive lime and oxygen plants and quality raw material from its HBI Plant. The products conform to quality requirements of international rating agencies like TUV Rhineland, Lloyds Register, API etc. This is the first steel plant in India to be awarded ISO 9002 certification for the complex as a whole. In addition, it is the first steel plant in India to receive ISO 14001 certification for the best environment management.

The Steel complex is the first fully integrated large-scale steel manufacturing facility in Western India and incorporates the latest state-of-the art equipment and technology for Steel making. The Company has emerged as the largest exporter of flat products from India with total exports aggregating over US\$ 1.25 billion since 1996 to different markets including US and Europe.

3.3 Global forays

Indian steel producers are eyeing and buying when it comes to the international markets. The regulatory environment, too, has changed for the better. Not only is it enabling the industry to stretch out to foreign shores, the country's steel industry is getting renewed global attention.

- Tata Steel has been given the green signal by the South African government to start construction on its US\$ 103 million ferrochrome steel plant at Richards Bay in the country's KwaZulu-Natal region.
- After acquiring Singapore's NatSteel last year, Tata Steel now plans to buy Thailand's Millennium Steel PCL for US\$ 400 million as part of its US\$ 23 billion expansion programme over the next 12 to 15 years.
- The acquisition of the Anglo-Dutch steelmaker Corus makes Tata Steel the world's fifth largest steelmaker, adding 19 MT of steel-making capacity.
- Jindal Steel is close to picking up a stake in Thailand's largest stainless steel producer.
- The country's fourth-largest steelmaker, Essar Steel, will partner two state-run Vietnamese companies to build a us\$ 527 million plant in that country. The company has a 0.4 MT production facility in Indonesia, apart from the 4.6 MT plant in India.
- The UK-based speciality steel and engineering group, Caparo's new facilities are coming up in Chennai, Pitampur, Bawal, Noida and Gurgaon.
- Mumbai-based Essar Global has agreed to buy Canada's Algoma Steel for US\$ 1.63 billion in the second largest Indian acquisition ever of a North American company. The deal will give Essar, India's fourth largest producer of the metal, a foothold in a lucrative developed market.

3. CHALLENGES AND OPPORTUNITIES

4.1 Challenges

Compared to the global average per capita consumption of 150 kgs. India's per capita consumption of steel is still a mere 39 kgs. per head. Even by Asian standards India have a long way to go in the consumption of steel. Technologically, the main hurdles before Indian steel industry are the cost of power and non availability of metallurgical coke.

4.1.1 *Unremunerative Prices*

Stagnating demand, domestic oversupply and falling prices in the last four years have hit Indian steel makers. Barring the sporadic rise in demand in the recent months, it has suffered from unremunerative prices to the extent that companies have been finding it difficult to maintain capital costs.

4.1.2 *Endemic Deficiencies*

These are inherent in the quality and availability of some of the essential raw materials available in India, eg, high ash content of indigenous coking coal adversely affecting the productive efficiency of iron-making and is generally imported. Advantage of high Fe content of indigenous ore are often neutralized by high basicity index. Besides, certain key ingredients of steel making, eg, nickel, ferro-molybdenum are also unavailable indigenously.

4.1.3 *Systemic Deficiencies*

However, most of the weaknesses of the Indian steel industry can be classified as systemic deficiencies. Some of these are described here.

4.1.4 *High Cost of Capital*

Steel is a capital intensive industry; steel companies in India are charged an interest rate of around 14% on capital as compared to 2.4% in Japan and 6.4% in USA.

4.1.5 *Low Labour Productivity*

In India the advantages of cheap labour gets offset by low labour productivity; eg, at comparable capacities labour productivity of SAIL and TISCO is 75 t/man year and 100 t/man year, for POSCO, Korea and NIPPON, Japan the values are 1345 t/man year and 980 t/man year.

4.1.6 *High Cost of Basic Inputs and Services*

High administered price of essential inputs like electricity puts Indian steel industry at a disadvantage; about 45% of the input costs can be attributed to the administered costs of coal, fuel and electricity, eg, cost of electricity is 3 cents in the USA as compared to 10

cents in India; and freight cost from Jamshedpur to Mumbai is \$50/tonne compared to only \$34 from Rotterdam to Mumbai. Added to this are poor quality and ever increasing prices of coking and non-coking coal.

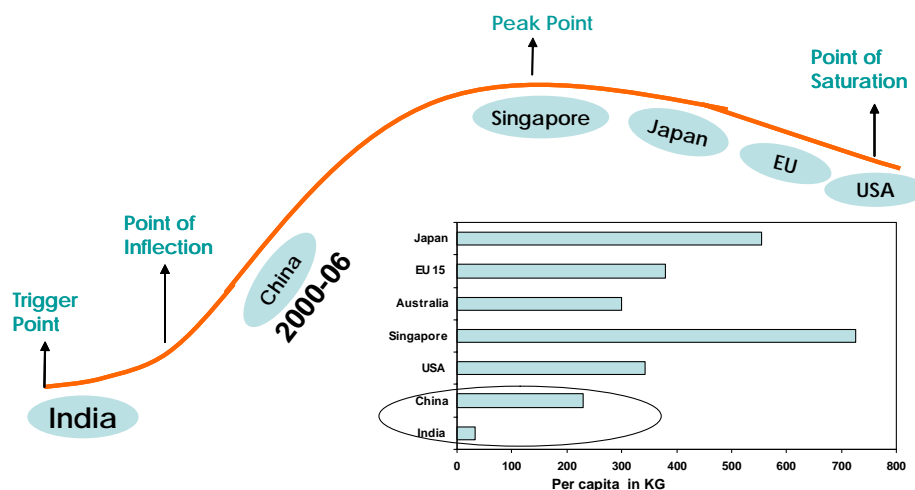
Other systemic deficiencies include:

- Poor quality of basic infrastructure like road, port etc
- Lack of expenditure in research and development.
- Delay in absorption in technology by existing units.
- Low quality of steel and steel products.
- Lack of facilities to produce various shapes and qualities of finished steel on-demand such as steel for automobile sector, parallel flange light weight beams, coated sheets etc.
- Limited access of domestic producers to good quality iron ores which are normally earmarked for exports, and
- High level taxation.

Besides these Indian steel makers also lacked in international competitiveness on determinants like product quality, product design, on-time delivery, post sales service, distribution network, managerial initiatives, research and development, information technology and labour productivity etc. As is evident in Table 4, the weaknesses gets reflected in India's poor standing in the global competitiveness as measured in terms of indicated parameters.

4.2 Opportunities

The biggest opportunity before Indian steel sector is that there is enormous scope for increasing consumption of steel in almost all sectors in India. The following graph gives a glimpse of untapped potential of increasing steel consumption in India; eg, even to reach the comparable developing and lately developed economies like China and other Europe, a quantum jump in steel consumption will be required.



Source: India Steel Outlook, Tata Steel

India has rich mineral resources. It has abundance of iron ore, coal and many other raw materials required for iron and steel making. It has the fourth largest iron ore reserves (10.3 billion tonnes) after Russia, Brazil, and Australia. Therefore, many raw materials are available at comparatively lower costs. It has the third largest pool of technical manpower, next to United States and the erstwhile USSR, capable of understanding and assimilating new technologies. Considering quality of workforce, Indian steel industry has low unit labour cost, commensurate with skill. This gets reflected in the lower production cost of steel in India compared to many advanced countries (Table 3).

4.2.1 Unexplored Rural Market

The Indian rural sector remains fairly unexposed to their multi-faceted use of steel. The rural market was identified as a potential area of significant steel consumption way back in the year 1976 itself. However, forceful steps were not taken to penetrate this segment. Enhancing applications in rural areas assumes a much greater significance now for increasing per capital consumption of steel. The usage of steel in cost effective manner is possible in the area of housing, fencing, structures and other possible applications where steel can substitute other materials which not only could bring about advantages to users but is also desirable for conservation of forest resources.

4.2.2 Other Sectors

Excellent potential exist for enhancing steel consumption in other sectors such as automobiles, packaging, engineering industries, irrigation and water supply in India. New steel products developed to improve performance simplify manufacturing/installation and reliability is needed to enhance steel consumption in these sectors. Main objective here have to be improvement of quality for value addition in use, requirement of less material by reducing the weight and thickness and finally reduction in overall cost for the end user.

Latest technology must be adopted by Indian steel manufacturers for production of superior quality of steel for these applications. For example, pre-coated sheets can be used in manufacture of appliances, furnishings, electric goods and public transport vehicles. Production and supply of superior grades of steel in desired shapes and sizes will definitely increase the steel consumption as this will reduce fabrication need, thereby reduce cost of using steel.

4.2.3 Export Market Penetration

It is estimated that world steel consumption will double in next 25 years. Quality improvement of Indian steel combined with its low cost advantages will definitely help in substantial gain in export market.