

# Long Products Scenario in India

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Steel is a versatile material. It is the most useful product for modern civilization. It has become a part of our daily life. Steel products have a wide range of applications from the manufacture of small pins to the building of automobiles, railway system, aircrafts, ship building, big construction and infrastructure projects to nuclear power stations and launching of satellites.

Though steel products are prone to corrosion with relatively high strength to weight ratio, yet alternative materials have not been able to make a significant dent on its consumption.

In fact, the global apparent consumption i.e. steel use of finished steel products has increased from 97.67 Mt in 2004 to 1412.6 Mt in 2012 as per World Steel Association – recording an average annual growth of

5.58 percent despite the adverse effect of global economic crisis that started in October, 2008 and the European financial meltdown in recent years. Consumption of steel is often regarded as a barometer for measuring the economic growth of a country. Steel is eco-friendly.

## Categories of Finished Steel Products

Finished steel products are usually divided into two categories viz. Non-flat or long products and Flat products. Long products are usually Bars & Rods, Structurals and Railway Materials. These products comprises of many sub-products as mentioned below:

- Bars & Rods include Rounds, Bars, Re-bars, Wire Rods etc.
- Structurals include Joists / Beams, Angles, Channels, Z-Sections, MS Arch etc.
- Railway materials include Rails, Wheels, Axles, Sleepers, and Crain Rails etc.

## Some Major Long Steel Products Reinforced Steel Bars (Re-bars)

Re-bars are long steel products that find applications in the construction industry. The usage of Reinforced Cement Concrete (RCC) has become

the accepted standard for the construction of residential and commercial structure, flyovers, bridges, water retaining structures, industrial buildings and power plants etc. Re-bars have a share of about 60 percent in the total consumption of long products in India and accounts for about 20 to 25 percent of the total material cost for civil construction.

## Growth of Re-bar Industry in India

Re-bars were a major steel products in apparent steel consumption among finished steel products in 2011-12 when its share in India's total finished steel consumption reached about 28 percent.

In India, rebars are produced by both the primary and secondary producers. Integrated steel producers like SAIL, Tata Steel, Vizag Steel Plant, JSW Steel, JSPL etc. produce re-bars



from pure iron and have a share of about 35 percent in total production while the balance 65 percent are produced by the secondary sector.

The dominance of CTD Bars in India since the early 70's of the last century was mainly due to the fact that most civil engineers at that time did not bother to check the vital parameters like yield strength, Ultimate Tensile Strength (UTS), elongation etc. while using CTD bars in RCC. The industrially developed countries had stopped the use of such CTD Bars by the start of 1970's.

Then came the era of Thermo-Mechanically Tested (TMT) Bars, which are even now being used by some civil engineers as they believe that these bars are of the specified grade Fe-415 as per 1786/1985 and are superior to the CTD bars which were being used earlier. However, these so-called TMT Bars available in the market were being used earlier. However, these so-called TMT Bars available in the market were often found on testing to have yield strength of 350-390 N/mm<sup>2</sup> only.

### Thermax & Tempcore Technologies

Both the Thermax and Tempcore technologies were developed in mid 1980's to produce re-bars that had superior properties than what was available in the CTD bars and the so called TMT Bars.

These products were introduced to aim at the then global demand of low cost high quality rebars that had a yield strength upto 500 N/mm<sup>2</sup> combined with high ductility so that adequate safety was ensured when using those Bars in seismic (earthquake prone) zones and to effect a saving in steel consumption. These reef Quenched and tempered bars were found to be far superior, by the civil engineers to the CTD and TMT bars which were being used earlier.

### Thermax Process

The bar, as it leaves the final mill stand, is guided by specially designed Thermax Pipes when the surface temperature of 900 - 1000C is drastically brought down in a short period of time of one second by intense and uniform cooling. The temperature

of the bar-core remains largely unaffected. The name Thermax has been derived from the thermal exchange and this exchange is the key to the process.

The drastic and pre-determined cooling of the bar periphery transforms the peripheral structure to martensitic and needs to be annealed to render the bar useful. The annealing is achieved by the heat available at the core. The peripheral and core temperatures finally equalize at about 600C and the resultant bar structure is of tempered martensite at the periphery and of fine grained ferrite-pearlite at the core.

The physical properties of Thermax 500 (Fe-500) are given below:

Minimum Yield Strength	500 N/mm <sup>2</sup>
Minimum Tensile Strength	10% more than YS-a min of 560N/mm <sup>2</sup>
Stress Ratio (TS/YS)	1.3 to 1.5
Minimum A5 Elongation (%)	16 (generally 18 to 22)
Weldability	Consistent with industry requirement.

Thermax bars saves steel consumption by about 20 percent as compared to the CTD bars.

Presently, HK India's Thermax self Quenching and tempered bars production system has gone up to over 140 units in India producing about 15 Mtpy of Thermax plain and ribbed bars. HSE has introduced the world's latest quenching technology under the brand name 'TEGUM' for plain and ribbed steel bars.

### Tempcore Process

In this process, the first stage of 'Quenching' begins when the hot-rolled bar leaves the final mill stand and is instantly quenched by a special water spray system. This converts the surface layer of the bar to a hardened structure called 'Martensite' while the core remains austenitic. The second stage of 'Self Tempering' begins under when the bar leaves the quenching box with a temperature gradient through its cross section, with the temperature of the core being higher than that of the surface. In this stage, heat flows from the core to the surface, giving it a structure called 'Tempered Martensite'. The core still remains austenitic.

The third stage of 'Atmospheric'



cooling takes place on the cooling bed where the austenitic core is converted to a ductile ferrite-pearlite core. Thus, the grain structure consists of a combination of tough outer layer of tempered martensite and a ductile core of ferrite-pearlite.

The special package offered by the 'Tempcore' process is a unique blend of properties – an excellent combination of strength and ductility. Advantages of using 'Tempcore' bars are as follows:

- Easy bend ability, weld ability and excellent ductility.
- Can be butt-welded or lap welded.
- Retains strength at higher temperature.
- Has universal use for concrete structure.
- Saves over 15/16 percent in steel consumption as compared to the CTD bars.

### Application of Thermax and Tempcore Process in India

Major producers of re-bars have introduced Thermax and Tempcore process in their production process.

#### SAIL

SAIL's Durgapur Steel Plant and Bhilai Steel Plant were pioneers in installing Thermax process in India. SAIL plants B.S.P, DSP and ISP producer's plain rounds, bright bars, TMT, TMT HCR, TMT Roof Bolts, TMT EQR etc.

The applications and special qualities of these products are shown below:

Product	Applications	Special Qualities
SAIL TMT	General concrete re-inforcements	Excellent bend ability, weld ability and high fatigue resistance on dynamic cooling
SAIL TMT HCR	Construction exposed to coastal, marine or underground environment	In addition to above, have corrosion resistant properties
SAIL TMT Roof Bolts	Underground mine roof support and slope stabilization in hills	Better bond properties with excellent properties
SAIL TMT EQR	Construction in earthquake prone areas	Better UTS / YS ratio

RINL's Vizag Steel Plant and Tata Steel were the pioneers in India in installing 'Tempcore' technology.

Vizag's Tempcore Re-bars attain higher strength and achieve excellent ductility, outstanding bendability and super weld ability because of lesser carbon content in the steel rolled. The quality of these re-bars is further enhanced due to low temperature rolling by way of higher strength.

Besides these, because of tension free rolling, close tolerances are possible to achieve and uniform quality of the product is guaranteed.

Tata Steel produces TISCON TMT and TISCON CRS branded quality re-bars.

### TISCON TMT

These bars, because of their unique process of manufacture, possess a combination of strength and ductility that is far in excess of the minimum limits for physical properties in IS: 1786 specifications.

The combination of high strength and high ductility of TISCON TMT bars allows designers to reduce consumption of steel in the structure and yet obtain an extremely safe construction.

The superior bend ability of TISCON TMT bars as compared to cold twisted bars makes them easy to fabricate with.

### Applications of TISCON TMT Bars

These bars can be used in all types concrete structures from large infrastructural structures like dams, thermal and hydel power plants and bridges to residential and commercial projects such as buildings, hotels and factories.

### TISCON CRS

These bars are subjected to rigorous corrosion susceptibility tests including

Alternate Immersion Test, Salt Spray Test, Potentio-Dynamic Test, Sulphur Dioxide Chamber Test, stress Corrosion Cracking Test, Hot Pack Environment Test and Atmosphere Exposure Test among others.

### Areas of Application of TISCON CRS Bars

Marine environment, industrial pollution, areas of heavy rainfall, high humidity, brackish water, saline sub-soil etc.

### Advantages of Using TISCON CRS Bars

- Longer life of structure
- High yield strength coupled with good ductility and bendability
- No extra precaution required for material handling and transportation
- No maintenance required during fabrication
- More suitable under poor manship at site.
- No extra precaution during welding.
- Can be bent and re-bent around very small mandrels.
- Fatigue tests show that these re-bars can be used as reinforcement material in seismic (earthquake prone) zones.

### Value Added Rebar Products

The use of rebar grades and products has undergone a remarkable change in recent years. Though the IS: 1786 codes specify only Fe-415 for reinforced cement concrete, its usage is declining sharply as the market is shifting to higher grades. The construction sector has started adopting new grades like Fe-500, Fe-550 and Fe-500D. Similarly, on the application too, rebar use has been moving towards high value-added products like Corrosion Resistant Steel Re-bars, Epoxy Coated Re-bars,

Earthquake Resistant Re-bars, and Galvanised Re-bars etc.

### Factors Favoring Emerging Re-bar Technology

The following factors are presently favoring the emerging rebar technology:

### Increased Awareness on Product Benefits

Increased awareness of corrosion protected and earthquake resistant re-bars and the benefit they offer in terms of longer and safer structural life and lower life cycle cost, has prompted project developers to include them in their projects.

### Product Differentiation

Increased competition in the rebar market has compelled the leading producers of re-bars to look for branding and product differentiation. The value-added products have been actively prompted by these producers to sustain their leadership in the rebar market.

### Increase in Number of Coastal Projects

In recent years the number of shore-based project share increased considerably.

Projects such as ports, coastal thermal power stations, coastal buildings for commercial use, desalination plants etc. are being implemented along the vast coastline of the country. All these new developments have increased the demand for corrosion protected products.

### Wire Rods

Wire Rods are an important product in long steel product family. They play a very significant role both in the industrial and construction sectors of the economy.

In the industrial sector, wire rods



have sophisticated use in atomic reactor vessels, auto and cycle tyres, armouring of submarine cables, spares, components and ancillaries for the automotive industry etc.

In the construction sector, wire rods are used in building of dwelling houses, hospitals, educational institutions, hotels, big commercial complexes, shopping malls, stayware bridges and in the development of transport system.

### Leading Producers of Wire Rods in India

SAIL's Bhilai Steel Plant commissioned its 400,000 tpy capacity Wire Rod Mill in 1967 and later upgraded it. Its wire rods are used in structural construction, arc welding electrodes, welding machine, in the manufacture of wire, nuts, bolts, reels, bright bars and other general engineering applications. The BSP wire rods are also used in cable armouring, wire mesh and other low carbon applications as well in railway sleepers and airports.

Tata Steel's 300,000 tpy capacity world class Wire Rod Mill became operational in March, 1987. It produces wire rods for electrodes, in fabrication and construction, pre-stressed concrete wires for railway sleepers, springs, auto cable wires of high carbon quality, high tensile fasteners made from Cold Heading Quality (CHQ) wire rods, tyre bead wires used in automotive and cycle tyres. Grade wise Tata Steel's Wire Rod Mill produces MS Wire Rods, low carbon and high carbon wire rods and

cold heading quality wire rods among others.

RINL's Vizag Steel Plant has a modern Wire Rod Mill of 850,000 tpy capacity. It produces mild steel wire rods, low and high carbon wire rods, CHQ Wire rods, bright bars, micro-alloyed and electrode quality wire rods. VSP's wire rods have better mechanical properties and chemical composition than those prescribed in IS:1786/1985.

### Secondary Sector Producers of Wire Rods

Some of the major producers in the secondary sector and their product profiles are mentioned below:

- Mukand Ltd.'s Wire Rod Mill at Kalwar in Maharashtra producer's cold heading quality wire rods in carbon, alloy and boron grades. The mill also produces stainless steel, leaded and sulphurised free cutting, low alloy and bright bar grades.

- Usha Martin Industries based in Jharkhand, has a Wire Rod Mill that produces ball bearing, boron, CHQ, bright bar, free cutting, electrode, value and alloy steel grades.

- Rathi Udyog of Ghaziabad, U.P. has a Wire Rod Mill which is capable of producing CHQ, bright bar, low alloy, low carbon, high carbon and electrode quality wire rods.

Other producers in the secondary sector like Ishar Alloy, Bangalore, Special Steel, Pune, Vizag Alloys, Bharuch, Gujarat and many more producers produces CHQ, bright bar, lead and sulphur bearing free cutting, electrode, ACSR etc. grades.

Secondary producers has share of about 70 percent of India's total production of Wire Rods.

### Uses of Various Types of Wires Drawn from Wire Rods

Wires drawn from various grades of wire rods and their use are shown below:

Wire Product	Uses
Bearing Steel Wires	Balls, Rollers, Bearings
Bright Bar Wire	Component, Spares, Ancillaries of Automobile
Flat Cable Armoured Wire	Cables and Conductors in Power Sector
Round Cable, Armoured Wire	Power Sector, Armouring Submarine Cables
Electrode Quality Wire	Electrode Manufacture
Galvanized Wire	For Barbing and Fencing, Telephone Sector
Galvanized Steel Wire Ropes	Telephone Industry, Railway Signals, Haulage
Wires for Industrial Chains	Industrial Chains for Engineering Industry
Pre-stressed Concrete Wire, Strands	Construction of Bridges, Silos, Atomic Reactor Vessels, Airport Hangers, Railways
Tyre Bead Wire	Auto and Cycle Tyers.
Cold Heading Quality Wires	High Tensile Bolts, Screws, Low Tensile Bolts Rivets, Nails etc.
Wire for Spring Industry	Manufacture of Spring in General, Tiller Springs, Galvanised Springs, Spring for Auto Sectors.
<b>ACSR Wires</b> Single and Stranded Wire Detonator Wire	Overhead Power Transmission Line Explosive for Mining

Wire Drawing Units, Bright Bar Units, Hardware & Fastener Units in India together consume about 2.5 Mt of wire rods per year.

## Structurals

Mill configuration and product mix of some of major Structural / Merchant Mills are presented below:

### Bhilai Steel Plant (BSP)



BSP's Rail and Structural Mill has a 2-Hi reversing roughing stand (950m diameter), two 3-Hi intermediate reversing stands (800m diameter) 2-Hi reversing finishing stand (850m diameter) followed by 7 hot saws, cooling bed, straightening machine, testing and finishing facilities including online ultrasonic and eddy current testing facilities for rails.

The mill is pre-dominantly being used as rail mill. In 2012-13, the mill produces about 850,000 tonnes of rails. The product range of the mill includes beams (250mm to 600mm), channels (250 to 400mm), and angles (150 to 200mm). The mill has produced India's longest rail track of 260 meter length. BSP is the sole supplier of rails to the Indian Railways.

Bhilai Merchant Mill is semi-continuous cross-country type single stand mill. Product mix includes channels (75 to 140mm) and angles (50 to 90mm). In 2010, three conventional stands of the mill were replaced by housing less stands.

BSP has placed an order with SMS Meer for the supply of a 1.2 Mtpy Universal Mill which will produce rails upto 75 kg/m and upto 130m length, welded panel upto 260m (future 520m), asymmetrical rails and head hardened rails. The mill will have two 2-Hi reversing stand with a compact three stand universal Tandem Groups (UR-E-UF) using X=H(R) rolling method patented by SMS Meer of Germany.

### Durgapur Steel Plant (DSP)



DSP has a 26 inch cross-country medium section mill with one reversing roughing stand, two 3-Hi intermediate stands and one 2-Hi reversing finishing stand. Product mix includes beams (175 to 200mm), channels (125 to 200mm) and angles (100 to 150mm). DSP has placed an order with Siemens VAI of Germany for installing an one million tonne per year capacity Medium Structural Mill that will produce Parallel Flanged Beams upto 270mm as well as channels and angles.

### IISCO Steel Plant (ISP)



ISP, Burnpur has a 34-inch Conventional Medium Structural Mill of 250,000 tpy capacity with one 2-Hi reversing roughing stand one 2-Hi reversing intermediate stand and one reversing finishing stand. Product Mix includes joists (250 to 450mm), channels (75 to 300mm), equal angles (65 to 150mm) and unequal angles (125 x 75 to 150 x 115mm). In its expansion programme, a heavy Universal Beam Mill of 0.85 Mtpy capacities will be installed by SMS Meer consortium. It will produce Parallel Flanged Beams upto 750mm and universal angles and channels. Technology will same as the universal mill being installed by SMS Meet at Bhilai Steel Plant.

### RINL's Vizag Steel Plant



Vizag Steel Plant has a Medium Merchant and Structural Mill with a capacity of 0.85 Mtpy. It is a single stand continuous mill with 8 roughing stands, 6 intermediate stands and 6 finishing stands. This is a high speed universal mill with computerized control. Universal beams (both parallel and wide flanged) have been rolled at VSP using universal stands.

### Jindal Steel & Power Ltd. (JSPL)



JSPL has installed a Rail & Universal Mill of 100,000 tpy capacity. It was a used mill, upgraded and revamped by SMS Group, Germany. The mill stands has been changed and new stand installed by SMS Meer. The mill installation includes Re-heating Furnace primary and secondary de-scalers, one 2-Hi reversible stand and three stand universal mill (UR-E-UF), cooling beds, straitening machine. Testing and finishing includes on-line ultrasonic and eddy current facilities for rails along with welding of rails to produce 480 meter long rails. Though the mill has produced 120 meter long rails, it is pre-dominantly used as a structural mill. It produces parallel beams: 200 x 100mm to 700 x 300mm and universal column upto 400 x 400mm.

### Railway Materials

SAIL's Bhilai Steel Plants (BSP) produces rail tracks of 13 and 26 meter length as well as long rail panels of 130 and 260 meter length at its Rail & Structural Mill. The mill producer's prime quality rails to IRST-12/2009, vanadium rail steel and corrosion - resistant rails. BSP rails are one of the cleanest available globally with a Hydrogen Content of 1.6 ppm (max). Bhilai will produce 110 UTS quality rails shortly.

SAIL's IISCO Steel Plant produces Crain Rails used for charging cars, coke cars, coal guide car track and coal tub tram cars in collieries.

**Table-1: Production for Sale of Long Products: 2007-08 to 2012-13 ('000 tonnes)**

Year	Bars & Rods	Structurals	Rly. Material	Total	Y-o-Y Change (%)
2007-08	20118	5043	1086	26317	==
2008-09	20686	5145	1177	27008	2.63
2009-10	21770	4141	1041	26952	(-) 0.21
2010-11	25912	4554	925	31391	16.47
2011-12	28102	4939	909	33950	8.15
2012-13 (P)	28847	4843	909	34599	1.91

Data Source : JPC: (P) = Provisional

**Table – 2: Imports of Long Products: 2007-08 to 2012-13 ('000 tonnes)**

Year	Bars & Rods	Structurals	Rly. Material	Total	Y-o-Y Change (%)
2007-08	436	76	20	532	==
2008-09	433	55	24	512	(-) 3.76
2009-10	588	91	12	691	34.96
2010-11	438	81	12	531	(-) 23.85
2011-12	425	63	12	500	(-) 5.84
2012-13 (P)	514	91	19	624	24.80

Data Source : JPC: (P) = Provisional

**Table – 3 : Exports of Long Products by India: 2007-08 to 2012-13 ('000 tonnes)**

Year	Bars & Rods	Structurals	Rly. Material	Total	Y-o-Y Change (%)
2007-08	213	73	==	286	==
2008-09	161	73	==	234	(-) 18.18
2009-10	212	55	==	267	14.10
2010-11	136	37	6	179	(-) 32.96
2011-12	225	44	42	311	73.74
2012-13 (P)	413	60	3	476	==

Data Source : JPC: (P) = Provisional

**Table – 4 : Apparent Consumption Long Products in India : 2007-08 to 2012-13 ('000 tonnes)**

Year	Bars & Rods	Structurals	Rly. Material	Total	Y-o-Y Change (%)
2007-08	20381	4990	1083	26454	==
2008-09	20552	5333	1191	27076	2.35
2009-10	21616	4199	985	26800	(-) 1.02
2010-11	26444	4619	971	32034	19.53
2011-12	28048	4950	869	33867	5.72
2012-13 (P)	29497	4899	918	35314	4.27

Data Source : JPC: (P) = Provisional

SAIL's DSP producers Wheel and Axle Sets, Diesel Loco Wheels, BG Sleeper Coach Wheels, AC Coach Wheel Sets. DSP's Wheel and Axle Plant producers Axle to IRS: R-16/1995 specifications. The wheels are tempered and trardened tested conforming to IRS: R-19/1993 and IRS: R-34/1999 specifications.

In 2012-13, SAIL plants had a share of 96.9 percent in India's total production for sale of railway materials.

## Production for Sale of Long Products in India

Production for sale is arrived at after deducting Inter-Plant Transfer (IPT) and producers own consumption from gross production.

Productions for sale of long products between 2007-08 to 2012-13 are shown in Table-1.

The negative growth in 2009-10 was due to the global crisis that started in October, 2008. The low growth in 2012-13 was due to low growth of the construction sector.

## Imports of Long Products

Imports of long steel products by India between 2007-08 and 2012-13 are shown in Table - 2.

The high growth in imports during 2009-10 was due to a robust domestic demand, as the construction sector, which mainly uses long products, recorded a high growth of over 8 percent. The high growth in imports during 2012-13 was due to a negative growth in production for sale in the previous year and its low base.

## Exports of Long Products

Exports of long steel products by India between 2007-08 and 2012-13 are shown in Table - 3.

The negative growth in consumption of long products in India during 2009-10 was due to global crisis that started in October, 2008. The high growth in 2010-11 was as a result of the low base in the previous year. The moderate growths in consumption in 2011-12 and 2012-13 were due to the weak performance of construction sector which uses mainly long products.

The share of long products in the total consumption of finished carbon steel products in 2011-12 and 2012-13 were 51.29 percent and 51.20 percent respectively. Since there is no double counting in long products, their apparent and real consumption are the same.

## Long Products: Essential for Growth of Construction Sector

Long steel products are essentially use by construction sector which includes the infrastructure sector. The growth of India's construction sector

has declined to 5.3 percent in 2011-12 from 8.0 percent in 2010-11 and went down further to 4.3 percent in 2012-13.

The Government has decided to invest US\$ 1 trillion for the development of India's infrastructure during the 12th Five Year Plan. Fifty percent of this investment will come from the public sector and the balance 50 percent from private sector.

Many infrastructure projects are held up for non-issuance of environmental and forest clearances followed by the absence of adequate coal supply.

The Ministry of Finance, Government of India, has identified 215 such projects worth Rs. 7 lakh crore for which bank funding has been made available. The major sectors affected by such non-clearances are: Power – Rs. 539,038 crore, Roads – Rs. 122,845 crore and Ports – Rs. 10,788 crore.

In a recent move, the government has removed the hurdles for 34 infrastructure projects, involving an investment of Rs. 1.4 lakh crore. The following projects are to be taking up on a Fast Track route.

- Fuel supply agreements for 17 power projects involving an investment of Rs. 95,000 crore.
- Fuel pacts for another 7 power projects with investment of about Rs. 28,000 crore will be signed by September, 2013.
- An environment clearance for 10 projects involving an investment of Rs. 15,000 crore has been received.

Besides the above, the Central Government is talking to the State Government for speeding up land acquisition for the road projects. Further, the problem of coal supply to the steel and aluminium projects will be taken up in right earnest by the Cabinet Committee on Investment (CCI).

One and half year of the 12th Five Year Plan has already elapsed. The growth of construction / infrastructure sectors during this period has been discouraging. What will happen in the future years is a matter of conjecture.

Experts have projected that the massive investment on infrastructure development during the 12th Plan



period will generate an additional steel demand of 30 to 35 million tonnes. Most of this demand will be for long products. The Indian steel producers should gear then up to face the challenge.

### **BIS Standard & Small Scale Producers of Long Products**

According to Steel Ministry's Steel and Steel Products (Quality Control) order, manufacture of steel and steel products will be allowed only after obtaining valid license from the Bureau of Indian Standards (BIS).

About 25 percent of India's total crude steel capacity comes from Induction Furnace (IF) route. They pre-dominantly produce long steel products. These furnaces are unable to reduce the phosphorus and sulphur to the levels as specified in the order. The IF sector consists of small and medium enterprises. They have not enough financial resources to conduct major R&D programme to improve the chemistry of their products. Many IF units will have to closed down and a production capacity of about 10 Mtpy will be lost.

In 2012-13, the Secondary Sector had a share of about 70 percent in India's total production of long products.

The Ministry is order also says, "Similar condition will be applicable to all imports included in the schedule of order and foreign producers exporting to India will have to register with the BIS for inspection of the products by BIS inspectors."

An official from Arcelor Mittal has told Metal Bulletin that the order was not in conformity with the rules of WTO and the European Commission has opposed such trade barriers.

According to the CEO of All India Steel Re-rollers Association, after strong protests by the industry, the Government has exempted the imports from the purview of the order: Petroleum industry and power projects in the infrastructure sector. He also said that several State Government have opposed the order since it shall result in the closure of a large number of steel units in their states leading to the retrenchment of workers, industrial unrest and a substantial loss to the State Government.

Steel experts, who have analysed the problem dispassionately, feel that the Government should review its decision and repeal the order so that steel production in the country does not suffer and help in its growth.

### **Conclusion**

Long steel products play a vital role in the development of a country's infrastructure. Major long product producers of India are upgrading their technology for producing long products for high end applications.

Due to a lack of investment, the growth of India's infrastructure sector has declined in recent time. The Government has planned a massive investment of US\$ 1 trillion during the 12th Five Year Plan. Even if 80 percent of this target is achieved, it may generate an additional steel demand of 30 to 35 Mt during the plan period. Most of these demand will be for long products.

Many new long product mills are coming up in the Public and Private Sector which will become operational during the 12th Plan period of these SAIL's new capacity would be 5.40 Mt and RINL's VSP will add new capacity of 2.40 Mt. The Private Sector plants will add another 3.50 Mt of new capacity.

It is expected that Indian steel producers will be able to meet the additional steel demand during the 12th Five Year Plan helped by a pro-active role of the Government.

### **Acknowledgement**

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