

INTRODUCTION

Steel is crucial to the development of any modern economy and is considered to be the backbone of human civilization. The level of per capita consumption of steel is treated as an important index of the level of socio-economic development and living standards of the people in any country.

Steel is a product of a large and technologically complex industry having strong forward and backward linkages and all major industrial economies have been largely shaped by the strength of their steel industries.

India's economic growth is dependent on the growth of the Indian steel industry. Steel continues to have a stronghold in traditional sectors such as construction, Housing and Roads, special steels are increasingly being used in engineering industries such as power generation, petrochemicals and fertilizers. India occupies a central position on the global steel map, with state-of-the-art steel mills, acquisition of global scale capacities by players, continuous modernization and up gradation of older plants, improving energy efficiency and backward integration with global raw material sources.

Steel industry derives its demand from other important sectors like infrastructure, aviation, engineering, construction, automobile, pipes and tubes etc. With the Indian economy poised for its next wave of growth under the reforms being unleashed in the last one year, there lies tremendous opportunity for the Indian steel industry to prosper and grow exponentially. The steel sector contributes nearly 2% of the country's GDP and employs over 6 lakh people. The per capita consumption of total finished steel in the country has risen from 51 kg in 2009-10 to about 60 kg in 2014-15 and 64 Kg in 2016-17.

Steel Sector - Industry Structure

On the basis of size, scale of operation and level of integration the steel makers are categorised as Integrated Steel Plants (ISPs) are the Primary producers using Blast Furnace and Basic Oxygen Furnace Route and secondary steel producers using Steel Scrap, DRI as raw material and using Electric Arc Furnace and Induction Furnace apart from other facilities.

The Indian steel industry is largely iron-based through the blast furnace (BF) or the direct reduced iron (DRI) route. Indian steel industry is highly consolidated. About 50% of the crude steel capacity is resident with integrated steel producers (ISP). But the changing ratio of hot metal to crude steel production indicates toward the increasing presence of secondary steel producers.

India has been holding the third position in the world order of steel production since 2015 by surpassing the US.

India's growth in steel production was the highest last year among the major producing nations. India's present steel-making capacity stands at 126 MT, which is likely to go past 150 MT by 2020. The government is targeting to add another 150 MT steel capacity in the country over the next 10 years.

India turned net exporter of steel this year and the trend is expected to continue as the metal's quality has become globally competitive. This is the beginning for India towards becoming a global player. It is already a net exporter after a gap of 3 years in 2016-17.

Domestic Crude steel production stood at 97.43 Million MT in April-March FY 2016-17 against 89.8 Million MT (MMT) in FY 16 with a jump of 8.5%. Steel export was up by 102.1% in April-March 2016-17 (8.244 MMT) over same period of last year. Meanwhile, steel import was at 7.277 MMT in April-March 2016-17, a decline of 38% over same period of previous year. Real consumption (Demand) went up by 2.6% to 83.652% in FY 17 creating a sharp gap between demand and consumption.

The trend will continue as the Indian steel is competitive in the global market in terms of quality and delivery,

India to continue to export to get better value and present itself as a global player and further. When its export reaches target of 15 million tonnes then internationally, people will notice that India is exporting so much of steel. India is 3rd steel producing and steel consuming nation in the world.

PRICE TREND IN FINISHED AND MAJOR STEEL MAKING RAW MATERIALS

Volatility in Raw material prices and depression in finished goods prices were seen as per the graphical trends. With an increase in demand and rise in price of finished steel goods, the closed and low capacity utilisation running plants have started production and improvements are seen in their utilization respectively. Though steel prices have increased in the market the plants dependent on coking coal / coke are still facing pressure on their margin.

It is recommended that with various cost control measures, increase in capacity utilisation (economy of scale), production of market oriented value added product mix, adoption of ore beneficiation and washing / blending of coal, use of waste heat boilers while maintaining heat and energy economy can bring some relief to their margins which is under pressure.

The domestic steel industry had been passing through a great turmoil for the past two years as a result of subdued demand and burgeoning predatory imports, though things have changed for the better with the imposition of a series of tariff and non-tariff measures since February last year (2016). However, while the private sector has been able to come out of the turmoil, PSU's SAIL and RINL have been incurring net losses after losses, though their financials have improved a bit recently towards the end of last fiscal FY17.

It is said while governments' series of measures to rein in imports have yielded results; exports were more than a compulsion for the domestic industry to substitute subdued demand within India.

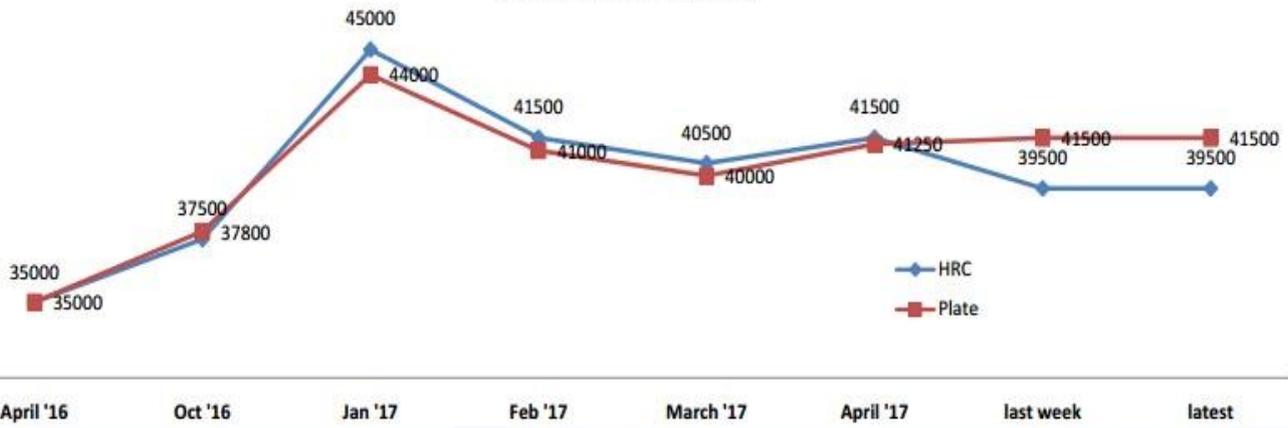
Starting from April, 2015, India has taken a slew of measures to counter predatory imports including raising import duty, imposition of minimum import price (MIP), anti-dumping duty and safeguard duty.

India's steel consumption growth remained weak in the current fiscal due to continued weakness in the key end-user industries, "2017-18 points to a favourable demand outlook for the steel sector in the medium-term,". Value added downstream units including fabrication units, components and OEM units shall bring improvement in demand/consumption.

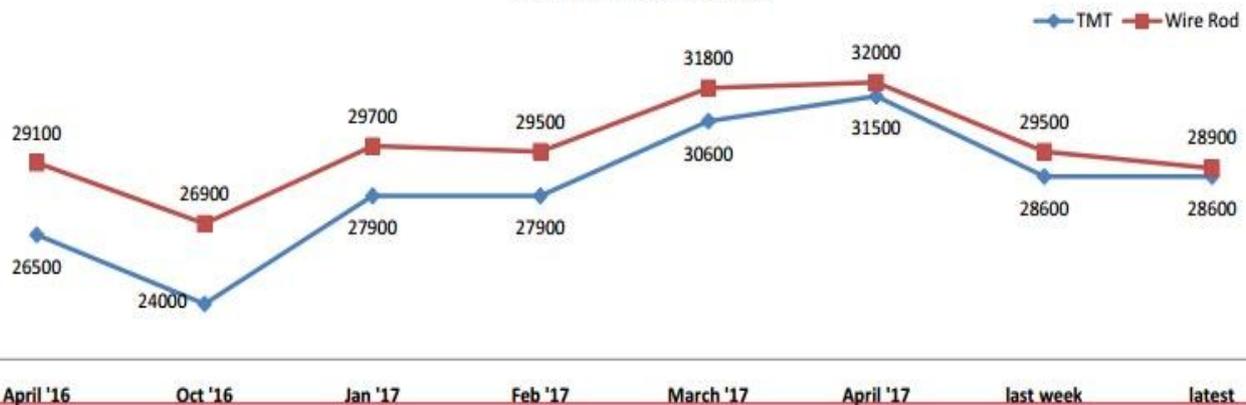
Industry is hopeful that the government's proposed 3.96 lakh crore investments, budgeted for the current fiscal, in the infrastructure sector would result in substantial increase in steel consumption.

Domestic Finished steel price trend

Flat Steel Price Trend (Delhi)



Long Steel Price Trend (Delhi)



Source: Steel Mint

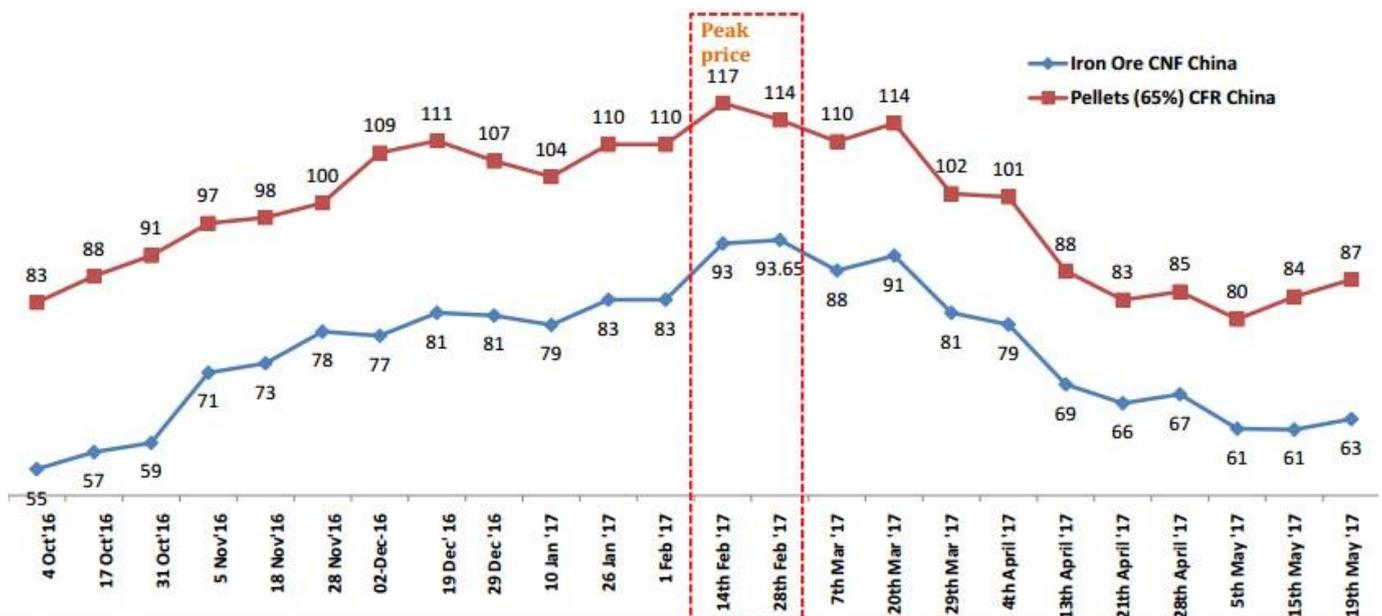
International Iron Ore & Pellet Prices soften in March-April '17 (CFR China - \$/MT)

International Pellet Prices:

- After peaking in Feb, have been on a decline

International Iron Ore Fines (Fe 62%)

- After peaking in Feb, have been on a decline



Source: Platts

International Coal : Price Trend

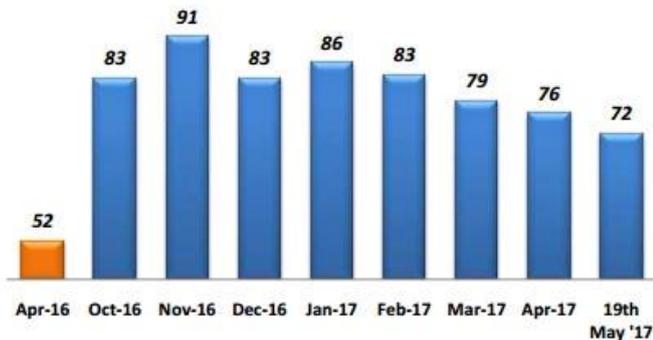
Prime Hard Coking Coal (\$/MT FOB Australia)



Semi Hard Coking Coal (\$/MT FOB Australia)



Steam Coal RB1 (\$/MT FOB S Africa)



International Coal Prices trend

(From April 2016 till date:)

- Prime Hard Coking Coal: Up by \$64/MT (FOB Australia)
- Semi Hard Coking Coal : Up by \$64/MT (FOB Australia)
- Steam Coal RB1 Coal : Up by \$20/MT (FOB S. Africa)

Source: Platts, Argus

B. MAJOR INTEGRATED STEEL PLANTS IN ODISHA

ROURKELA STEEL PLANT

On 3 February 1959, the then president Rajendra Prasad inaugurated RSP's first blast furnace named 'Parvati' when the company was known as Hindustan Steel Limited (HSL). Subsequently, the RSP became a unit of the [Steel Authority of India Ltd \(SAIL\)](#). Rourkela Steel Plant (RSP), the first integrated steel plant in the public sector in India, was set up with German collaboration with an installed capacity of 1 million tonnes. Subsequently, its capacity was enhanced to 2 million tonnes of hot metal, 1.9 million tonnes of crude steel and 1.67 million tonnes of saleable steel. After implementing a massive modernisation and expansion, Rourkela Steel Plant has enhanced its capacity to 4.5 million tonnes of Hot Metal and 4.2 Million Tonnes of Crude Steel.

Rourkela Steel Plant (RSP) has registered its best ever production performance in all major areas like Hot Metal production from Blast Furnace-5, Crude Steel and Saleable Steel in 2016-17. During the fiscal, the New Blast Furnace-5 made 27,57,210 tonnes of steel, an increase of 30.5 per cent over the previous year 2015-16. All time high records were achieved in the field of Total Sinter (52,70,089 tonnes), Total Crude Steel (29,32,460 tonnes) and Total Saleable Steel (27,41,972 tonnes).

The average rate of pushing in the New Coke Ovens Battery-6 was 87.9 per day as compared to 74.9 during the previous year, while another key unit which had come up as part of the Modernisation and Expansion – New Plate Mill, rolled out 5,40,388 tonnes of plates, a rise of 149 per cent over the previous fiscal, it said. With this, the total plates production in RSP too touched a new high at 9,64,001 tonnes.

Techno-economic front plays a major role in the financials of the Plant. The specific energy consumption during the year was an all time best at 6.430 Giga Calories per tonne of crude steel and blast furnace productivity touched the highest ever figure of 2.067 tonnes/metre cube/day in 2016-17, the release said.

Facilities Completed:

- New Coke Oven Battery -6 (7 m tall, 1 x 67 ovens)
- New Sinter Plant -3 (1 x 360m²)
- New Blast Furnace -5, 4060 m³ useful volume
- New 3rd Single Strand Slab Caster (1.5 MTPA)
- New Oxygen Plant 2x700 tpd on BOO basis
- New 3rd BOF (150 T) Convertor
- New 4.3 meter Wide Plate Mill

TATA STEEL -KALINGANAGAR

Tata Steel projects of Kalinganagar had entered into a MoU with the Govt of Odisha on dt. 17.11.2004 with an investment plan of Rs. 15400 cr in two phases. Phase-1 was envisaged of Rs. 10400 Cr for 3 MTPA and Phase -II was with investment of Rs. 5000 Cr for another 3 MTPA with total capacity of 6 MTPA. Phase-I of Tata Steel Kalinga nagar steel plant had started trial production wef Sept 2015 with following facilities

- Blast furnace nfor producing Hot metal Capacity 3.3.MTPA
- Steel Melting Shop for producing crude steel capacity 3MTPA
- Rolling Mill for producing finish steel ie. Hot Rolled Coil(HRC) capacity 3.5 MTPA

The 1st. Phase of modernisation of Kalinga Nagar Project ,Dubri was dedicated to nation by Hon.Chief Minister of Odisha on 18th Nov'2015 and commercial production started in May 2016.

Also, it had Commissioned Ferro-Chrome plant at Gopalpur, Odisha with a capacity of 55,000 mtpa .

Tata Steel has also started exports of Hot Rolled Coils (HRC) and Tata Ferro-shots from its Kalinganagar plant and the products have been received well in the market.

JSPL-Jindal Steel and Power Limited

JSPL entered into a MoU with govt of odisha on on dt 3.11.2005 with an investment plan of Rs 13,135.02 Cr for establishment of 6 MTPA integrated steel plant and 900 MW CPP (Captive Power Plant) at Angul, Odisha.

- **Coke Oven-SSIT China**

JSPL has taken the technological knowhow from and key process equipments from **SSIT-China** to produce 0.8 MTPA of coke from a non recovery type stamp charged coke oven Battery. The plant will be able use indigenous wash coal produce and produce metallurgical coke for Blast Furnace application.

- New Blast furnace: Danieli-Corus Technology supplier and JSPL executer Blast Furnace of Hearth volume of 4554 CBM with a design capacity 4MTPA.

Blast Furnace.

The 1681m³ (Inner Volume) Blast Furnace which is producing 1.4 MT of Hot Metal per annum is one of the best operating Blast Furnace in India having very high productivity and high Pulverize Coal Injection (PCI) rate.

Jindal Steel and Power Limited (JSPL) has launched its 6 million tonne per annum (MTPA) integrated steel plant at Angul (Odisha) with an investment of Rs 33,000-cr at its plant at Angul. The plant was dedicated to the nation by Sri Naveen Patnaik, Hon'ble Chief Minister of Odisha, on May 27, 2017.

"As India looks to reach a steel manufacturing capacity of 300 million tonnes by 2030, It is a proud moment to note that 20 percent of steel will continue to be manufactured in Odisha. My vision is to create 30 lakh additional employment opportunities by 2025, and bring in prosperity for the people of the state. What we are witnessing today is yet another step towards realising this vision," said Naveen Patnaik on the occasion.

JSPL's integrated steel plant at Angul will provide direct employment opportunities to over 30,000 people and indirect employment to over 1 lakh individuals. The completion of plant spread over 3500 acres at Angul, with an investment of Rs 33,000 crore, ramps up JSPL's iron & steel making capacities significantly.

JSPL recently completed all major iron and steel making installations at the 6 MTPA integrated steel plant, including India's largest blast furnace of 4 MTPA at Angul.

"The completion of all major core iron & steel making installations at the 6 MTPA steel plant at Angul is a major landmark defining the future growth trajectory of JSPL to grow exponentially in line with the national steel production capacity target of 300 MTPA by 2030".

The blast furnace at Angul is part of the company's proposed 12.5 MTPA steel plant and 2,600 MW of power projects in phases.

JSL(Jindal Stainless Limited) -Kalinganagar

M/s Jindal stainless Limited entered into a MoU with Govt. Of Odisha on dt.9.6.2005 for steeling up an Integrated Steel Plant of 1.6 MTPA at Kalinganagar with an investment of Rs. 7628 Crore. Project has already been implemented and production was started on 27.09.2005.

Jindal Stainless Limited is one of the largest integrated manufacturers of stainless steel in India with a capacity of 1 million tons per annum. A leader and a name synonymous with Enterprise, Excellence and Success, the company's ethos mirrors most characteristics similar to the metal it produces; Akin to stainless steel Jindal Stainless Limited is innovative and versatile in its thought process; strong and unrelenting in its operations.

The state-of-the-art unit of Jindal Stainless is located in the eastern part of India in the state of Odisha. The plant comprises of 250,000 tons per annum of Ferro Alloy's facilities with world class technology and equipments sourced from Siemens VAI, SMS Siemag and Andritz Sundwig.

The complex, equipped with captive power generation facility, is eventually scalable up to 3.2 million tons per annum of stainless steel making after it has already obtained approval from HLCA.

It is reported that India has overtaken Japan to become the second largest stainless steel producer in the world after China.

According to data released by the International Stainless Steel Forum, Company's Jajpur plant envisages complete integration from mining to cold rolling along with captive power plant. Production facilities for Ferro Alloys, Coke Oven, Captive Power Plant, Stainless Steel Melt Shop, Hot Rolling Mill and Cold Rolling Mill have been set-up and are in operation progressively since year 2005. It has significantly ramped up its capacity up to 0.43 MMT of Coke, 0.95 MMT of Cold Rolled and 1.6 MMT of Hot rolled products.

Bhushan Power & Steel Limited, Sambalpur

The Company has successfully implemented 2.8 million tpa Integrated Steel and Power Plant in Orrisa comprising 8 DRI Kilns of 500 TPD, 376 MW Power Plant, Coal Washery, two CSP Plant, Blast Furnace, Coke Oven Plant, Sinter Plant, Oxygen Plant, Steel Making and Lime & Dolomite Plant, Cold Rolling Mill, Galvanizing and Galvalume.

BSL (Bhushan Steel Ltd) Dhenkanal

Bhushan Steel is presently operating 6.0 mtpa integrated steel plant based on Direct Reduced Iron-blast furnace iron making facilities. BSL is a source for vivid variety of products such as Hot Rolled Coil, CRCA, CRFH, Galvanized Coil and Sheet, Galume Coil and Sheet, Color Coated Coils, Color Coated Tiles, High Tensile Steel Strips, Hardened & Tempered Steel Strips, Precision Tubes, HFW/ERW Pipe (API Grade), 3LP Coated Pipes, Billets and Sponge Iron.

Being amongst the prime movers of the technological revolution in Indian Cold Rolled Steel Industry, BSL has emerged as the country's largest and the only Cold Rolled Steel Plant with an independent line for manufacturing Cold Rolled Coil and Sheet up to a width of 1700mm .It is also having a Galvanized Coil and Sheet line up to a width of 1350 mm.

WAY FORWARD

- Expeditious finalization of 'Metal Recycling Policy' so that steel scrap is available domestically as a raw material to steel industry. This will reduce dependency on Iron ore and other Iron ore bearing steel raw material.
- Railway ministry have agreed to allow slurry pipeline across railway lines. This will help in bringing down cost of transportation and environment friendly. Slurry pipelines as logistics costs account for around 15 per cent of the total cost of steel production in India,
- To work on the feasibility of increasing steel usage in housing projects under Pradhan Mantri Awas Yojana-Urban.
- To execute strategies to increase demand for steel in India and include the concept of **Life Cycle Cost Analysis** in General Financial Rules.
- Primary and secondary steel producers together to establish a "Big-data Analytics & Application Centre for Steel". The objective is to pool resources and information available with all steel companies and analyse the collected data. This will help to promote usage of steel by statistically demonstrating the advantages of steel over other materials and also to explore new areas where steel can be used.
- The minister also said the industry needs to focus on is Research & Development. In spite of being World's third largest steel producer, India still imports huge quantities of value-added and special steels which are not being made in India. R&D in steel sector needs to be oriented to market requirements and customer needs. 'Steel Research & Technology Mission of India,' which will function as the umbrella body for all steel- related R&D in India.