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Industry Report on Iron & Steel Industry

04 June 2024

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Table of Contents

List of Charts

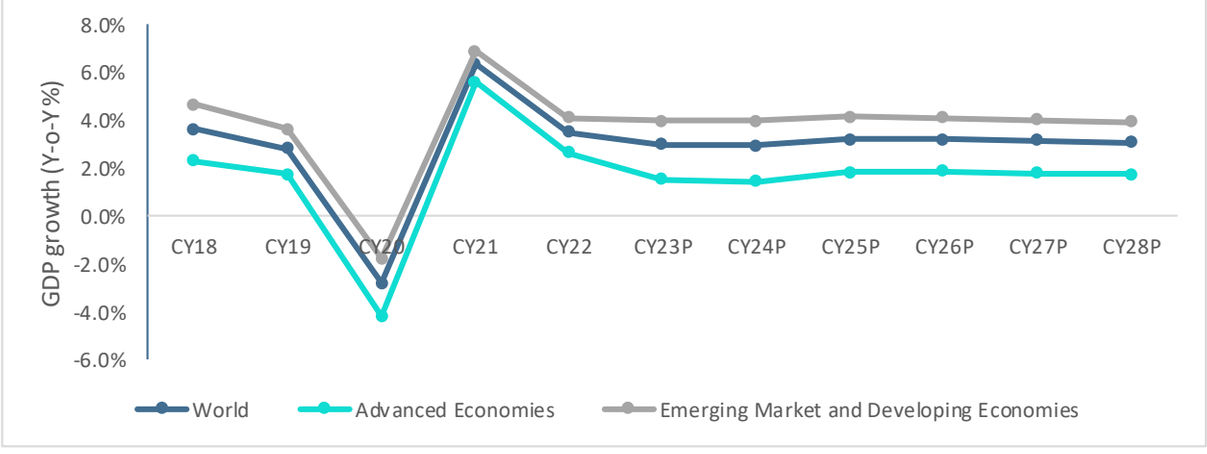
List of Tables

1 Economic Outlook

1.1 Global Economy

As per the International Monetary Fund (IMF)'s World Economic Outlook growth projections released in October 2023, the global economic growth for CY22[1] stood at 3.5% on a year-on-year (y-o-y) basis, down from 6.3% in CY21 due to disruptions resulting from the Russia-Ukraine conflict and higher-than-expected inflation worldwide. On the other hand, the global economic growth for CY23 is projected to slow down further to 3.0% and 2.9% in CY24, attributed to compressing global financial conditions, expectant steeper interest rate hikes by major central banks to fight inflation, and spill-over effects from the Russia-Ukraine conflict, with gas supplies from Russia to Europe expected to remain tightened. For the next 4 years, the IMF projects world economic growth in the range of 3.0%-3.2% on a y-o-y basis.

Chart 1: Global Growth Outlook Projections (Real GDP, Y-o-Y change in %)



Notes: P-Projection;
Source: IMF – World Economic Outlook, October 2023

Table 1: GDP growth trend comparison - India v/s Other Economies (Real GDP, Y-o-Y change in %)

	Real GDP (Y-o-Y change in %)									
	CY19	CY20	CY21	CY22	CY23P	CY24P	CY25P	CY26P	CY27P	CY28P
India	3.9	-5.8	9.1	7.2	6.3	6.3	6.3	6.3	6.3	6.3
China	6.0	2.2	8.5	3.0	5.0	4.2	4.1	4.1	3.7	3.4
Indonesia	5.0	-2.1	3.7	5.3	5.0	5.0	5.0	5.0	5.0	5.0
Saudi Arabia	0.8	-4.3	3.9	8.7	0.8	4.0	4.2	3.3	3.3	3.1
Brazil	1.2	-3.3	5.0	2.9	3.1	1.5	1.9	1.9	2.0	2.0
Euro Area	1.6	-6.1	5.6	3.3	0.7	1.2	1.8	1.7	1.5	1.3
United States	2.3	-2.8	5.9	2.1	2.1	1.5	1.8	2.1	2.1	2.1

P- Projections; Source: IMF- World Economic Outlook Database (October 2023)

Advanced Economies Group

The major advanced economies registered GDP growth of 2.6% in CY22, down from 5.6% in CY21, which is further projected to decline to 1.5% in CY23. This forecast of low growth reflects increased central bank interest rates to fight inflation and the impact of the Russia-Ukraine war. About 90% of advanced economies are projected to witness decline GDP growth in CY23 compared to CY22. In addition, this is further expected to decline to 1.4% in CY24.

One of the major countries from this group is the **United States**. The United States registered GDP growth of 2.1% in CY22 compared to 5.9% in CY21. Whereas, growth for CY23 and CY24 is projected at 2.1% and 1.5%, respectively. Among advanced economies group, private consumption has been stronger in the United States than in the euro area. The business investments have also been robust in the second quarter, in addition, the general government fiscal stance of United States is expected to

[1] CY – Calendar Year

be expansionary in CY23. However, the unemployment rate is expected to rise coupled with declining wages and savings. With this, the GDP growth is expected to soften in near term.

Further, the **Euro Area** registered GDP growth of 3.3% in CY22 compared to 5.6% in CY21. For CY23 and CY24, the growth is projected at 0.7% and 1.2%, respectively. There is divergence in GDP growth across the euro area. Wherein, Germany is expected to witnesses slight contraction in growth due to weak interest rate sensitive sector and slow trading demand. On the other hand, the GDP growth for France has been revised upwards on account of growing industrial production and external demand.

Emerging Market and Developing Economies Group

For the emerging market and developing economies group, GDP growth stood at 4.1% in CY22, compared to 6.9% in CY21. This growth is further projected at 4.0% in CY23 and CY24. About 90% of the emerging economies are projected to make positive growth. While the remaining economies, including the low-income countries, are expected to progress slower.

Further, in **China**, growth is expected to pick up to 5.0% with the full reopening in CY23 and subsequently moderate in CY24 to 4.2%. The property market crisis and lower investment are key factors leading to this moderation. Whereas, **India** is projected to remain strong at 6.3% for both CY23 and CY24 backed by resilient domestic demands despite external headwinds.

The **Indonesian** economy is expected to register growth of 5% both in CY23 and CY24 with a strong recovery in domestic demands, a healthy export performance, policy measures, and normalization in commodity prices. In CY22, **Saudi Arabia** was the fastest-growing economy in this peer set with 8.7% growth. The growth is accredited to robust oil production, non-oil private investments encompassing wholesale and retail trade, construction and transport, and surging private consumption. Saudi Arabia is expected to grow at 0.8% and 4.0% in CY23 and CY24, respectively. On the other hand, **Brazil** is expected to project growth of 3.1% in CY23 driven by buoyant agriculture and resilient services in the first half of CY23.

Despite the turmoil in the last 2-3 years, India bears good tidings to become a USD 5 trillion economy by CY27. According to the IMF dataset on Gross Domestic Product (GDP) at current prices, the Nominal GDP has been estimated to be at USD 3.4 trillion for CY22 and is projected to reach USD 5.4 trillion by CY27. India's expected GDP growth rate for coming years is almost double compared to the world economy.

Besides, India stands out as the fastest-growing economy among the major economies. The country is expected to grow at more than 6% in the period of CY24-CY28, outshining China's growth rate. By CY27, the Indian economy is estimated to emerge as the third-largest economy globally, hopping over Japan and Germany. Currently, it is the third-largest economy globally in terms of Purchasing Power Parity (PPP) with a ~7% share in the global economy, with China [~18%] on the top followed by the United States [~15%]. Purchasing Power Parity is an economic performance indicator denoting the relative price of an average basket of goods and services that a household needs for livelihood in each country.

Despite Covid-19's impact, high inflationary environment and interest rates globally, and the geopolitical tensions in Europe, India has been a major contributor to world economic growth. India is increasingly becoming an open economy as well through growing foreign trade. Despite the global inflation and uncertainties, Indian economy continues to show resilience. This resilience is mainly supported stable financial sector backed by well-capitalized banks and export of services in trade balance. With this, the growth of Indian economy is expected to fare better than other economies majorly on account of strong investment activity bolstered by the government's capex push and buoyant private consumption, particularly among higher income earners.

1.2 Indian Economic Outlook

1.2.1 GDP Growth and Outlook

Resilience to External Shocks remains Critical for Near-Term Outlook

India's real GDP grew by 9.1% in FY22 and stood at ~Rs. 149 trillion despite the pandemic and geopolitical Russia-Ukraine spillovers. In Q1FY23, India recorded 13.1% y-o-y growth in real GDP, largely attributed to improved performance by the agriculture and services sectors. Following this double-digit growth, Q2FY23 witnessed 6.2% y-o-y growth, while Q3FY23 registered 4.5% y-o-y growth. The slowdown during Q2FY23 and Q3FY23 compared to Q1FY23 can be attributed to the normalization of the base and a contraction in the manufacturing sector's output.

Subsequently, Q4FY23 registered broad-based improvement across sectors compared to Q3FY23 with a growth of 6.1% y-o-y. The investments, as announced in the Union Budget 2022-23 on boosting public infrastructure through enhanced capital expenditure, have augmented growth and encouraged private investment through large multiplier effects in FY23. Supported by fixed investment and higher net exports, real GDP for full-year FY23 was valued at ~Rs. 160 trillion registering an increase of 7.2% y-o-y.

Furthermore, in Q1FY24, the economic growth accelerated to 7.8%. The manufacturing sector maintained an encouraging pace of growth, given the favorable demand conditions and lower input prices. The growth was supplemented by a supportive base alongside robust services and construction activities. This momentum was maintained in the Q2FY24 with GDP growth at 7.6%, mainly supported by acceleration in investments. However, private consumption growth was muted due to weak rural demand and some moderation in urban demand amid elevated inflationary pressures in Q2FY24. On the supply side, a significant improvement in manufacturing and construction activities supported growth. Overall, the economy expanded by 7.7% in H1FY24 compared to 5.3% in H2FY23.

GDP Growth Outlook

• Driven by resilience in urban demand and the front loading of the government's capital expenditure, the H1FY24 witnessed a strong growth. While festive cheer will support urban demand in Q3FY24, the outlook for rural demand revival remains clouded amid monsoon deficiency and likely hit to the agricultural production.

• The recent announcements of various relief measures such as LPG price reduction and extension of Pradhan Mantri Garib Kalyan Anna Yojna (PMGKAY) are expected to provide some cushion and so far, investment demand has remained robust. However, there could be some moderation in H2FY24 as both the government and private sector may restrain their capital spending ahead of the general elections. Despite some expected moderation in the H2FY24, India's overall GDP growth for FY24 is expected to remain on a firm footing.

• Strong credit growth, resilient financial markets, and the government's continual push for capital spending and infrastructure are likely to create a compatible environment for investments.

• External demand is likely to remain subdued with a slowdown in global activities, thereby indicating adverse implications for exports. Additionally, heightened inflationary pressures and resultant policy tightening may pose a risk to the growth potential.

Taking all these factors into consideration, in December 2023, the RBI in its bi-monthly monetary policy meeting forecasted a real GDP growth of 7.0% y-o-y for FY24.

Table 2: RBI's GDP Growth Outlook (Y-o-Y %)

FY24P (complete year)	Q3FY24P	Q4FY24P	Q1FY25P	Q2FY25P	Q3FY25P
7.0	6.5	6.0	6.7%	6.5%	6.4%

Note: P – Projected; Source: Reserve Bank of India

1.2.2 Gross Value Added (GVA)

Gross Value Added (GVA) is the measure of the value of goods and services produced in an economy. GVA gives a picture of the supply side whereas GDP represents consumption.

Industry and Services sector leading the recovery charge

• The gap between GDP and GVA growth turned positive in FY22 (after a gap of two years) due to robust tax collections. Of the three major sector heads, the service sector has been the fastest-growing sector in the last 5 years.

• The **agriculture sector** was holding growth momentum till FY18. In FY19, the acreage for the rabi crop was marginally lower than the previous year which affected the agricultural performance. Whereas FY20 witnessed growth on account of improved production. During the pandemic-impacted period of FY21, the agriculture sector was largely insulated as timely and

proactive exemptions from COVID-induced lockdowns to the sector facilitated uninterrupted harvesting of rabi crops and sowing of kharif crops. However, supply chain disruptions impacted the flow of agricultural goods leading to high food inflation and adverse initial impact on some major agricultural exports. However, performance remained steady in FY22.

Further, in Q1FY23 and Q2FY23, the agriculture sector recorded a growth of 2.4% and 2.5%, respectively, on a y-o-y basis. Due to uneven rains in the financial year, the production of some major Kharif crops, such as rice and pulses, was adversely impacted thereby impacting the agriculture sector's output. In Q3FY23 and Q4FY23, the sector recorded a growth of 4.7% and 5.5%, respectively, on a y-o-y basis.

Overall, the agriculture sector performed well despite weather-related disruptions, such as uneven monsoon and unseasonal rainfall, impacting yields of some major crops and clocked a growth of 4% y-o-y in FY23, garnering ~Rs. 22 trillion. In Q1FY24, this sector expanded at a slower pace of 3.5% compared to a quarter ago. This further stumbled to 1.2% in Q2FY24. Overall, H1FY24 registered a 2.4% growth with weakest monsoon experience caused by El Nino conditions

Going forward, rising bank credit to the sector and increased exports will be the drivers for the agriculture sector. However, a deficient rainfall may impact the reservoir level weighing on prospects of rabi sowing.

• The **industrial sector** witnessed a CAGR of 6.3% for the period FY16 to FY19. From March 2020 onwards, the nationwide lockdown due to the pandemic significantly impacted industrial activities. In FY20 and FY21, this sector felt turbulence due to the pandemic and recorded a decline of 1.4% and 0.9%, respectively, on a y-o-y basis. With the opening up of the economy and resumption of industrial activities, it registered 11.6% y-o-y growth in FY22, albeit on a lower base.

The industrial output in Q1FY23 jumped 9.4% on a y-o-y basis. However, in the subsequent quarter, the sector witnessed a sharp contraction of 0.5% due to lower output across the mining, manufacturing, and construction sectors. This was mainly because of the poor performance of the manufacturing sector, which was marred by high input costs. In Q3FY23, the sector grew modestly by 2.3% y-o-y. The growth picked up in Q4FY23 to 6.3% y-o-y owing to a rebound in manufacturing activities and healthy growth in the construction sector. Overall, the industrial sector is estimated to be valued at ~Rs. 45 trillion registering 4.4% growth in FY23.

The industrial sector grew by 5.5% in Q1FY24, while Q2FY24 growth was up by 13.2% owing to positive business optimism and strong growth in new orders supported manufacturing output. The industrial growth was mainly supported by sustained momentum in the manufacturing and construction sectors. Within manufacturing (as captured by IIP numbers), industries such as pharma, non-metallic mineral products, rubber, plastic, metals, etc., witnessed higher production growth during the quarter. The construction sector (13% growth in Q2FY24) benefited from poor rainfall during August and September and higher implementation of infrastructure projects. This was reflected in robust cement and steel production and power demand in Q2FY24. Overall, H1FY24 picked up by 9.3% with manufacturing and construction activities witnessing significant acceleration.

Forthcoming, despite the consumer market thriving in festive season in the second half of this fiscal, RBI monetary tightening could potentially curb credit growth and discretionary spending among urban households. Also, lagging rural consumption and election related capex hurdles in early 2024 is likely to pose slowdown in industrial segment, while this segment is signaling overall resurgence.

• The **services sector** recorded a CAGR of 7.1% for the period FY16 to FY20, which was led by trade, hotels, transport, communication, and services related to broadcasting, finance, real estate, and professional services. This sector was the hardest hit by the pandemic and registered an 8.2% y-o-y decline in FY21. The easing of restrictions aided a fast rebound in this sector, with 8.8% y-o-y growth witnessed in FY22.

In Q1FY23 and Q2FY23, this sector registered a y-o-y growth of 16.3% and 9.4%, respectively, on a lower base and supported by a revival in contact-intensive industries. Further, the services sector continued to witness buoyant demand and recorded a growth of 6.1% y-o-y in Q3FY23. Supported by robust discretionary demands, Q4FY23 registered 6.9% growth largely driven by the trade, hotel, and transportation industries. Overall, benefitting from the pent-up demand, the service sector was valued at ~Rs. 80 trillion and registered growth of 9.5% y-o-y in FY23.

Whereas in Q1FY24, the services sector growth jumped to 10.3%. Within services, there was a broad-based improvement in growth across different sub-sectors. However, the sharpest jump was seen in financial, real estate, and professional services. Trade, hotels, and transport sub-sectors expanded at a healthy pace gaining from strength in discretionary demand. The

service sector growth in Q2FY24 moderated to 5.8% partly due to the normalization of base effect and some possible dilution in discretionary demand. Considering these factors, service sector marked 8% growth in H1FY24.

With this performance, steady growth in various service sector indicators like air passenger traffic, port cargo traffic, GST collections, and retail credit are expected to support the services sector.

Table 3: Sectoral Growth (Y-o-Y % Growth) - at Constant Prices

At constant Prices	FY18	FY19	FY20 (3RE)	FY21 (2RE)	FY22 (1RE)	FY23 (PE)	H1FY23	H1FY24
Agriculture, Forestry & Fishing	**6.6**	**2.1**	**6.2**	**4.1**	**3.5**	**4**	**2.4**	**2.4**
Industry	**5.9**	**5.3**	**-1.4**	**-0.9**	**11.6**	**4.4**	**4.3**	**9.3**
Mining & Quarrying	-5.6	-0.8	-3	-8.6	7.1	4.6	5.1	7.6
Manufacturing	7.5	5.4	-3	2.9	11.1	1.3	0.9	9.3
Electricity, Gas, Water Supply & Other Utility Services	10.6	7.9	2.3	-4.3	9.9	9	10.3	6.4
Construction	5.2	6.5	1.6	-5.7	14.8	10	10.7	10.5
Services	**6.3**	**7.2**	**6.4**	**-8.2**	**8.8**	**9.5**	**12.6**	**8.0**
Trade, Hotels, Transport, Communication & Broadcasting	10.3	7.2	6	-19.7	13.8	14	20.1	6.6
Financial, Real Estate & Professional Services	1.8	7	6.8	2.1	4.7	7.1	7.8	9.0
Public Administration, Defence and Other Services	8.3	7.5	6.6	-7.6	9.7	7.2	12.6	7.7
GVA at Basic Price	**6.2**	**5.8**	**3.9**	**-4.2**	**8.8**	**7**	**8.6**	**7.6**

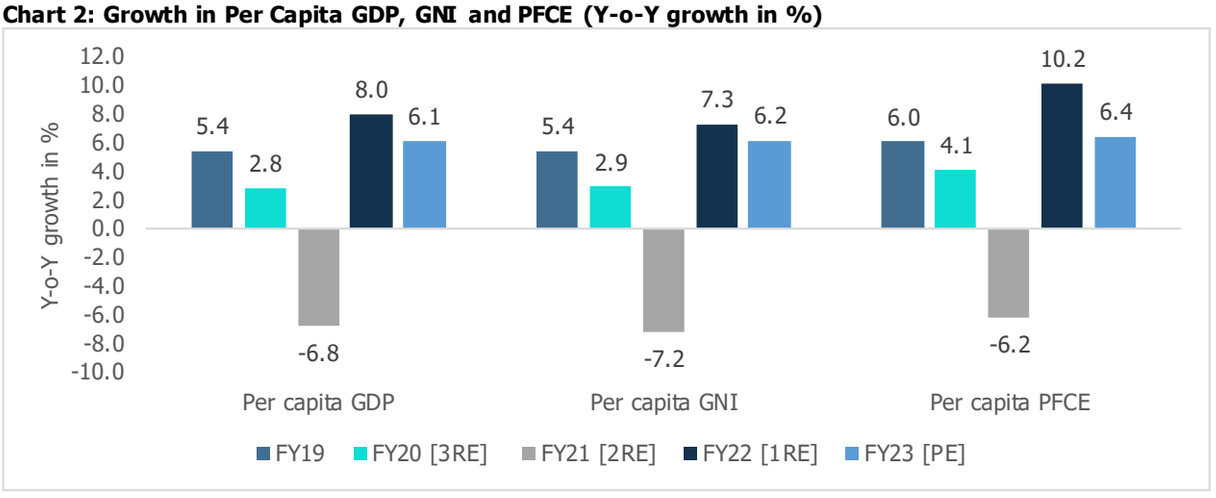
Note: 3RE – Third Revised Estimate, 2RE – Second Revised Estimates, 1RE – First Revised Estimates, PE – Provisional Estimate; Source: MOSPI

Per capita GDP, Per Capita GNI and Per Capita PFCE

India has a population of about 1.4 billion with a young demographic profile. The advantages associated with this demographic dividend are better economic growth, rapid industrialization and urbanization.

Gross Domestic Product (GDP) per capita is a measure of a country's economic output per person. FY21 witnessed significant de-growth due to the pandemic. However, in FY22 the economy paved its way towards recovery and the per capita GDP grew by 8.0%. This growth was moderated to 6.1% due to the correction of base effect in FY23. The per capita Gross national income (GNI) also increased by 7.3% in FY22 and 6.2% in FY23. The per capita private final consumption expenditure (PFCE), which represents consumer spending, increased by 10.2% in FY22 and 6.4% in FY23.

Chart 2: Growth in Per Capita GDP, GNI and PFCE (Y-o-Y growth in %)

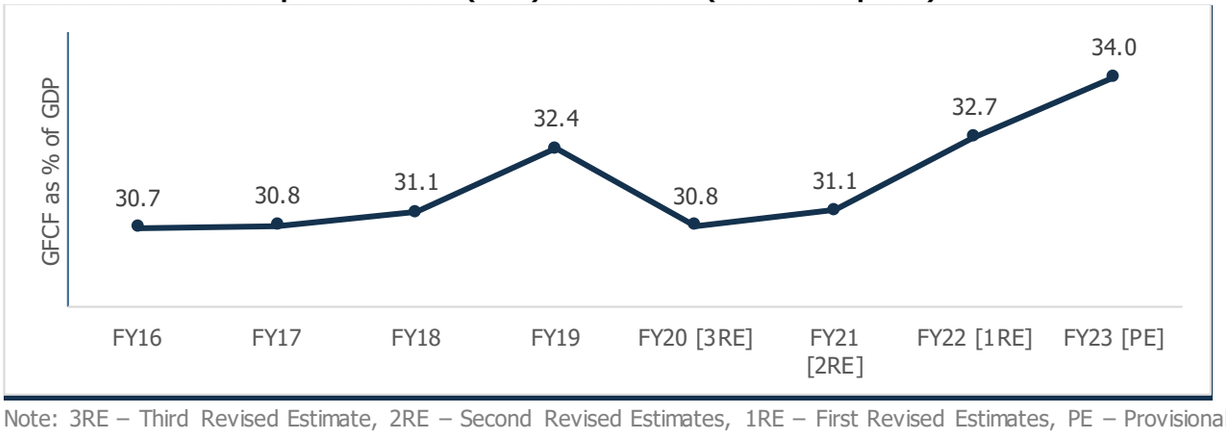


Note: 3RE – Third Revised Estimate, 2RE – Second Revised Estimates, 1RE – First Revised Estimates, PE – Provisional Estimate; Source: MOSPI

1.2.3. Investment Trend in Infrastructure

Gross Fixed Capital Formation (GFCF), which is a measure of the net increase in physical assets, witnessed an improvement in FY22. As a proportion of GDP, it is estimated to be at 32.7%, which is the second-highest level in 7 years (since FY15). In FY23, the ratio of investment (GFCE) to GDP climbed up to its highest in the last decade at 34%, as per the advanced estimate released by the Ministry of Statistics and Programme Implementation (MOSPI).

Chart 3: Gross Fixed Capital Formation (GFCF) as % of GDP (At constant prices):



Note: 3RE – Third Revised Estimate, 2RE – Second Revised Estimates, 1RE – First Revised Estimates, PE – Provisional Estimate; Source: MOSPI

Overall, the support of public investment in infrastructure is likely to gain traction due to initiatives such as Atmanirbhar Bharat, Make in India, and Production-linked Incentive (PLI) scheme announced across various sectors.

1.2.4. Industrial Growth

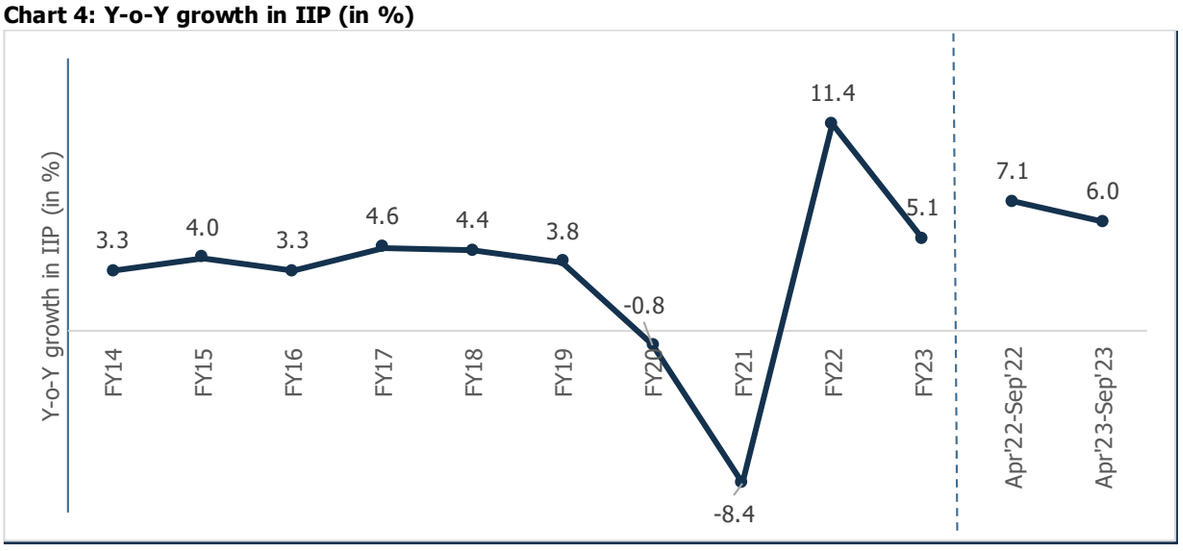
Improved Core and Capital Goods Sectors helped IIP Growth Momentum

The Index of Industrial Production (IIP) is an index to track manufacturing activity in an economy. On a cumulative basis, IIP grew by 11.4% y-o-y in FY22 post declining by 0.8% y-o-y and 8.4% y-o-y, respectively, in FY20 and FY21. This high growth was mainly backed by a low base of FY21. FY22 IIP was higher by 2.0% when compared with the pre-pandemic level of FY20, indicating that while economic recovery was underway, it was still at very nascent stages.

During FY23, the industrial output recorded a growth of 5.1% y-o-y supported by a favorable base and a rebound in economic activities. The period April 2023 – September 2023, industrial output grew by 6.0% compared to the 7.1% growth in the corresponding period last year. So far in the current fiscal, while the infrastructure-related sectors have been doing well, slowing global growth and downside risks to rural demand have posed a challenge for industrial activity. Though the continued

moderation in inflationary pressure offers some comfort, pain points in the form of elevated prices of select food items continue to persist.

Chart 4: Y-o-Y growth in IIP (in %)



Source: MOSPI

1.2.5 Consumer Price Index

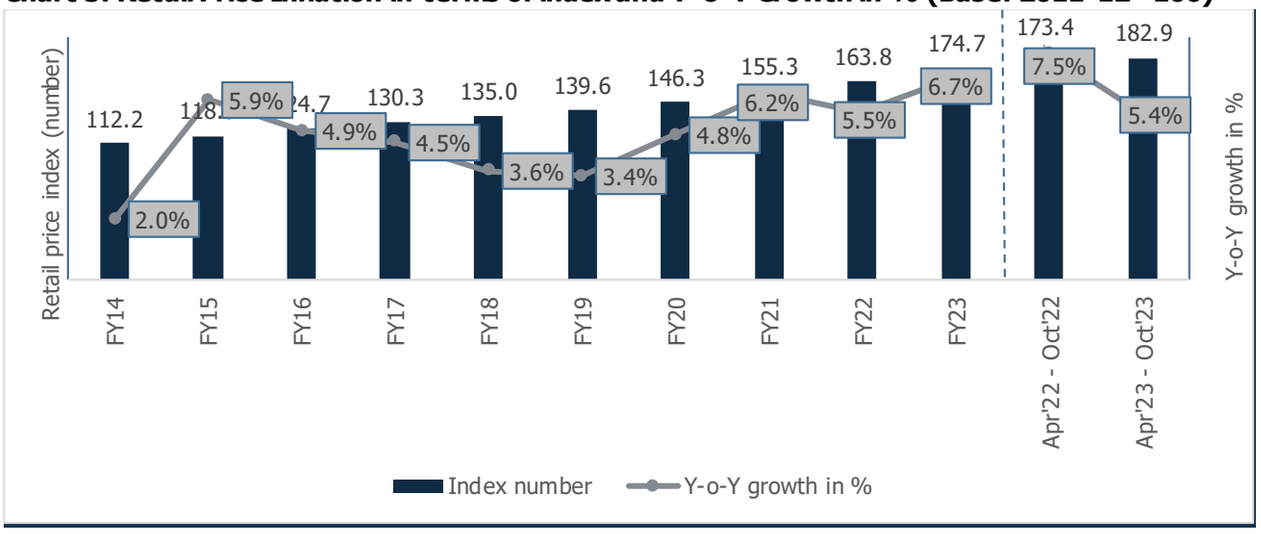
India's consumer price index (CPI), which tracks retail price inflation, stood at an average of 5.5% in FY22 which was within RBI's targeted tolerance band of 6%. However, consumer inflation started to upswing from October 2021 onwards and reached a tolerance level of 6% in January 2022. Following this, CPI reached 6.9% in March 2022.

CPI remained elevated at an average of 6.7% in FY23, above the RBI's tolerance level. However, there was some respite toward the end of the fiscal wherein the retail inflation stood at 5.7% in March 2023, tracing back to the RBI's tolerance band. Apart from a favorable base effect, the relief in retail inflation came from a moderation in food inflation.

In the current fiscal FY24, the CPI moderated for two consecutive months to 4.7% in April 2023 and 4.3% in May 2023. This trend snapped in June 2023 with CPI rising to 4.9%. In July 2023, the CPI had reached the RBI's target range for the first time since February 2023 at 7.4% largely due to increased food inflation. This marked the highest reading observed since the peak in April 2022 at 7.8%. The notable surge in vegetable prices and elevated inflation in other food categories such as cereals, pulses, spices, and milk have driven this increase. Further, the contribution of food and beverage to the overall inflation had risen significantly to 65%, surpassing their weight in the CPI basket. In August 2023, the food inflation witnessed some moderation owing to government's active intervention. This was further moderated for second consecutive month in September 2023 to 5%, led by a sharp correction in vegetables prices and lower LPG prices. Helped by deflation in the fuel and light category, the retail inflation in October 2023 softened at 4.9%.

Overall, the declining trend in the headline as well as core inflation is comforting in the current fiscal. However, it remains to be seen if it sustains, given the weak prospects for the Kharif harvest and the expected hit to Rabi sowing amid lower reservoir levels in major agricultural states.

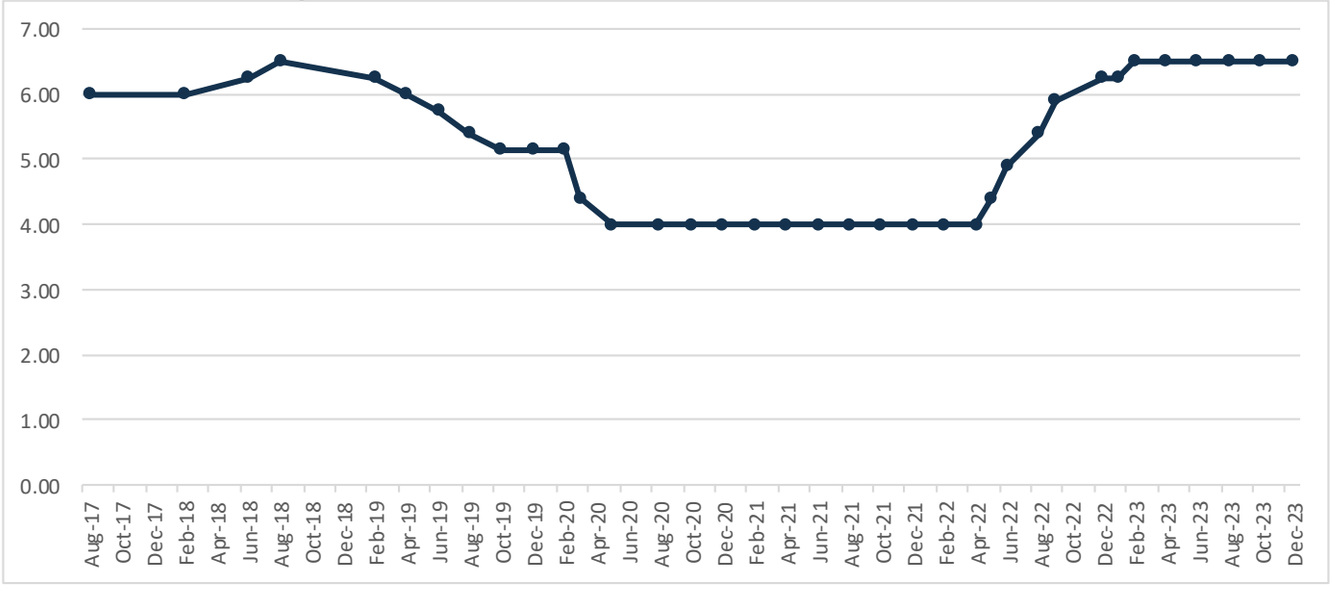
Chart 5: Retail Price Inflation in terms of index and Y-o-Y Growth in % (Base: 2011-12=100)



Source: MOSPI

The CPI is primarily factored in by RBI while preparing their bi-monthly monetory policy. The RBI has increased the repo rates with the rise in inflation in the past year from 4% in April 2022 to 6.5% in January 2023.

Chart 6: RBI historical Repo Rate



Source: RBI

However, with the inflation easing over the last few months, RBI has kept the repo rate unchanged at 6.5% in the last five meetings of the Monetary Policy Committee. At the bi-monthly meeting held in December 2023, RBI projected inflation at 5.4% for FY24 with inflation during Q3FY24 at 5.6%, Q4FY24 at 5.2% Q1FY25 at 5.2% , Q2FY24 at 6.5% and Q3FY24 at 6.4%.

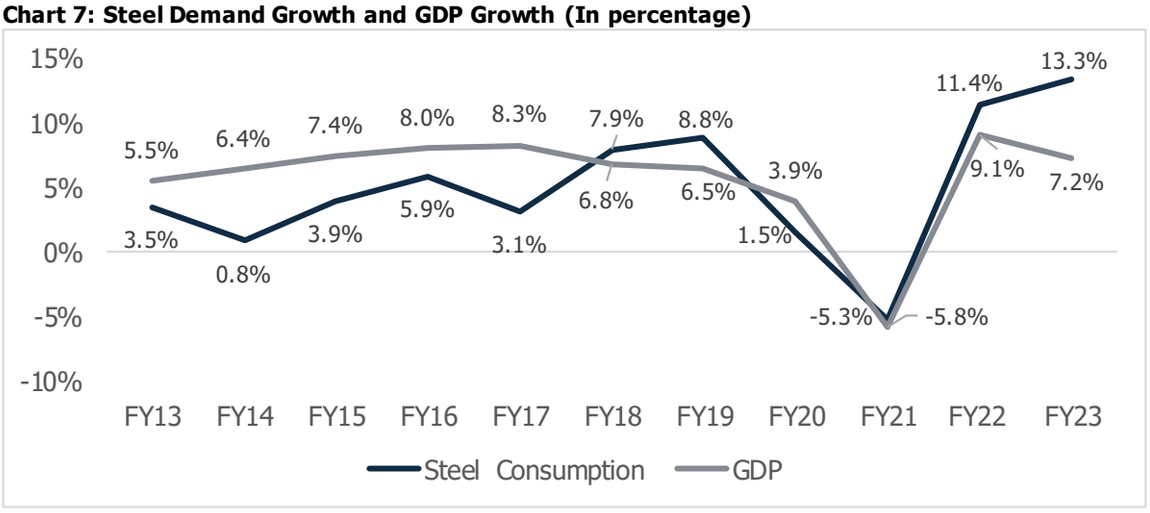
In a meeting held in December 2023, RBI also maintained the liquidity adjustment facility (LAF) corridor by adjusting the standing deposit facility (SDF) rate of 6.25% as the floor and the marginal standing facility (MSF) at the upper end of the band at 6.75%.

Further, the central bank continued to remain focused on the withdrawal of its accommodative stance. With domestic economic activities gaining traction, RBI has shifted gears to prioritize controlling inflation. While RBI has paused on the policy rate front, it has also strongly reiterated its commitment to bringing down inflation close to its medium-term target of 4%. Given the uncertain global environment and lingering risks to inflation, the Central Bank has kept the window open for further monetary policy tightening in the future, if required.

1.2.6 Correlation of Steel Demand with GDP Growth

The steel demand in India is closely correlated to GDP growth as expansion in GDP leads to healthy growth in the construction and manufacturing as well as demand for housing, automobile, and railways, which in turn drives the steel consumption. While steel consumption growth lagged the GDP growth between FY13 to FY17, it has been broadly in line or higher than GDP growth since FY18, except in FY20.

Chart 7: Steel Demand Growth and GDP Growth (In percentage)



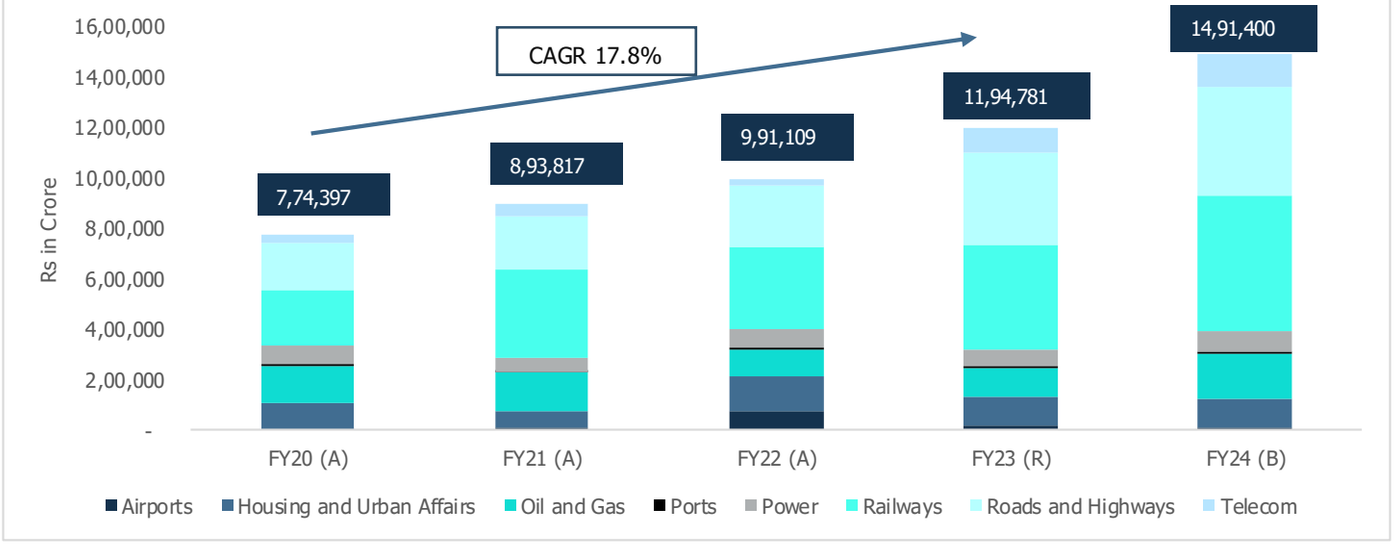
Source: CMIE

1.2.7 Budgetary Outlay Towards Infrastructure and Governmental Infra-Projects

One of the key drivers for economic growth is increased infrastructure investment thrust by the Government of India. In the Union Budget 2023-24, the government continued its focus on infrastructure development with budget estimates of capital expenditure towards infrastructure sector of Rs. 14,91,400 crores (including investments in PSUs) in 2023-24 (24.8% increase) over revised estimates of 2022-23.

Oil & Gas sector saw the highest increase in the budgetary allocation to Rs 1,77,908 crores followed by telecom to Rs.1,35,393. Allocation of airports has reduced to Rs 6,562 crores on account of sale of Air India and Privatization of Airports.

Chart 8: Key infrastructure sectors for Capital Expenditure in budget 2023-24



R - Revised, B - Budget

Source: Union Budget 2023-24 Analysis (includes Investment in PSU's)

Some of the key government infrastructure schemes includes:

• The 2023-24 budget by the Government highlights the impetus for growth by focusing on big public investment for modern infrastructure, which shall be guided by **PM Gati Shakti** and benefited by the synergy of multi-modal approach. It's a step towards economic growth as well as sustainable development and is driven by seven engines, namely, Roads, Railways, Airports, Ports, Mass Transport, Waterways, and Logistics Infrastructure. 100 critical transport infrastructure projects have been identified at an investment of Rs 75,000 crore including Rs 15,000 crore from private players. For the urban infrastructure in Tier – II and Tier – III cities, a corpus of Rs 10,000 crore has been set aside via establishment of Urban Infrastructure Development Fund.

• The Government has also announced plans for announced plans for **the National Monetization Pipeline (NIP)** and Development Finance Institution (DFI) to improve the financing of infrastructure projects. The NIP covering rural and urban infrastructure, entailed investments to the tune of Rs.111 lakh crores, which is being undertaken by the central government, state governments and the private sector during FY20-25.

• The government has helped the growth of urbanization through a number of schemes and projects, including the **Smart Cities Mission, the Atal Mission for Rejuvenation and Urban Transformation (AMRUT),** and the **Pradhan Mantri Awas Yojana (Urban)**.

Smart Cities Mission: Smart Cities Mission launched on 25 June 2015, is aimed at providing core infrastructure, clean and sustainable environment and a decent quality of life to their citizens through the application of 'smart solutions'. It is a transformational mission aimed to bring about a paradigm shift in the practice of urban development in the country. Under this mission, 100 smart cities have taken up projects across diverse sectors related to mobility, energy, water, sanitation, solid waste management, vibrant public spaces, social infrastructure, smart governance, etc. As on September 2023, about 6,000+ projects worth more than Rs. 1.1 lakh crore have been completed and the remaining projects will be completed by 30 June 2024.

AMRUT: Atal Mission for Rejuvenation and Urban Transformation (AMRUT) was launched on 25th June 2015 in selected 500 cities and towns across the country. The Mission focuses on development of basic infrastructure, in the selected cities and towns, in the sectors of water supply; sewerage and septage management; storm water drainage; green spaces and parks; and non-motorized urban transport. A set of Urban Reforms and Capacity Building have been included in the Mission.

This mission has been subsumed under AMRUT 2.0, which was launched on 01st October, 2021 for the period of five years i.e. from the financial year 2021-22 to the financial year 2025-26, is designed to provide universal coverage of water supply through functional taps to all households in all the statutory towns in the country and coverage of sewerage/septage management in 500 cities covered in first phase of the AMRUT scheme.

PMAY: There is significant thrust on providing housing for all under the Pradhan Mantri Awaas Yojna (PMAY) by the government and the scheme has been getting steady allocation under the union budget. Further, the sustained efforts in sanctioning and completing a substantial number of houses under both PMAY-Urban and PMAY-Gramin schemes demonstrates the government's commitment towards promoting affordable housing and improving living conditions for individuals and families across the country.

1.2.8 Concluding Remarks

The major headwinds to global economic growth are escalating geopolitical tensions, volatile global commodity prices, and a shortage of key inputs. Despite the global economic growth uncertainties, the Indian economy is relatively better placed in terms of real GDP growth compared to other emerging economies. It is expected to grow at 6.3% in CY24 compared to the world real GDP growth projection of 3%. The bright spots for the economy are continued healthy domestic demand, support from the government towards capital expenditure, moderating inflation, and improving business confidence.

Likewise, several high-frequency growth indicators including the purchasing managers index, auto sales, bank credit, and GST collections have shown improvement in FY23. Moreover, normalizing the employment situation after the opening up of the economy is expected to improve and provide support to consumption expenditure.

Further, as per the Indian Meteorological Department (IMD), the rainfall witnessed a deficit until September 2023. A drop in yield due to irregular monsoons and a lower acreage can lead to a demand-supply mismatch, further increasing the inflationary pressures on the food basket. Moreover, the consumption demand is expected to pick up in Q3FY24 due to the festive season. Going forward, the rising domestic demand will be driven by the rural economy's performance and continual growth in urban consumption. However, high domestic inflation and global headwinds pose a downside risk to domestic demand.

At the same time, public investment is expected to exhibit healthy growth as the government has allocated a strong capital expenditure of about Rs. 10 lakh crores for FY24. The private sector's intent to invest is also showing improvement as per the data announced on new project investments. However, volatile commodity prices and economic uncertainties emanating from global turbulence may slow down the improvement in private CapEx and investment cycle

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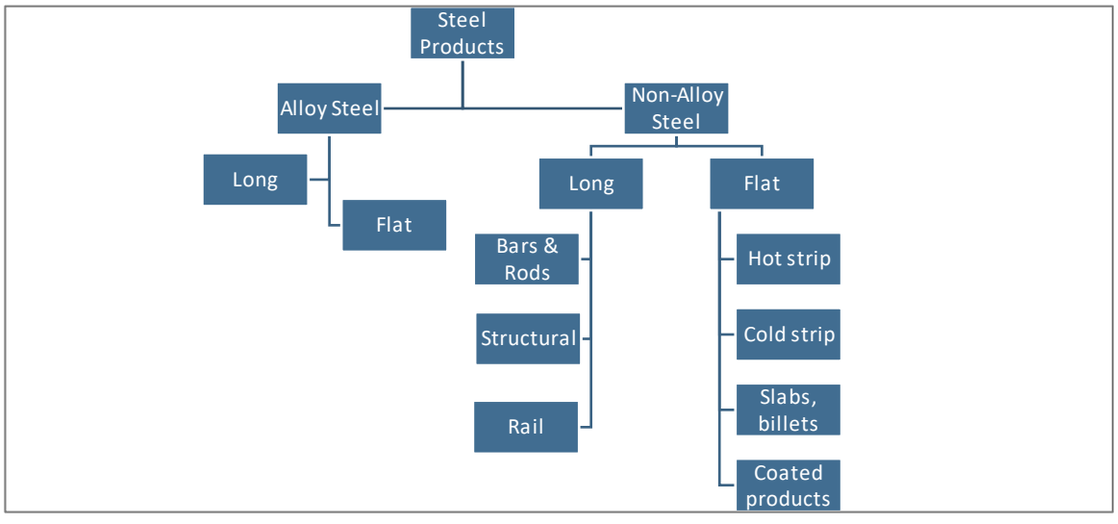
2 Global Steel Industry

2.1 Overview of the Global Steel Industry

Steel is a paramount material in the fields of construction and engineering. It has widespread applications in industries such as automotive, construction, consumer goods, infrastructure, mechanical & medical equipment, packaging, and utensils, among others. Its popularity stems from its abundant availability, cost-effectiveness, exceptional strength and durability, ductility, and recyclability. According to the World Steel Association, there are over 3,500 different grades of steel produced worldwide, each possessing unique physical, chemical, and environmental properties to suit various applications.

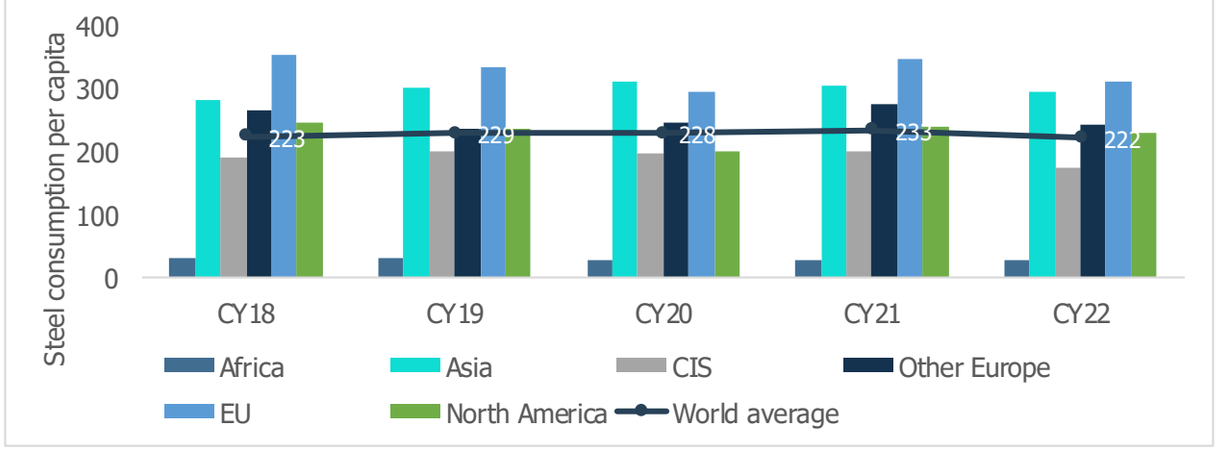
Chart 9 : Types of Steel Products



Source: Industry sources, CareEdge Research

Further, the global per capita consumption of steel has been on the rise. For instance, the consumption increased to 233 kg in 2021 from 223.2 kg in 2018. However, it decreased to 222 Kg in 2022 as the demand was affected by macroeconomic factors such as global slowdown and uncertainties due to the Russia-Ukraine war. Whereas the per capita consumption of EU 27 (Europe Union) was the highest at 310.3 kg in CY22, driven by high consumption in Germany, Italy, and France followed by Asia (294.7 kg) and Other Europe – The United Kingdom, Turkey, and Others (242.9 kg).

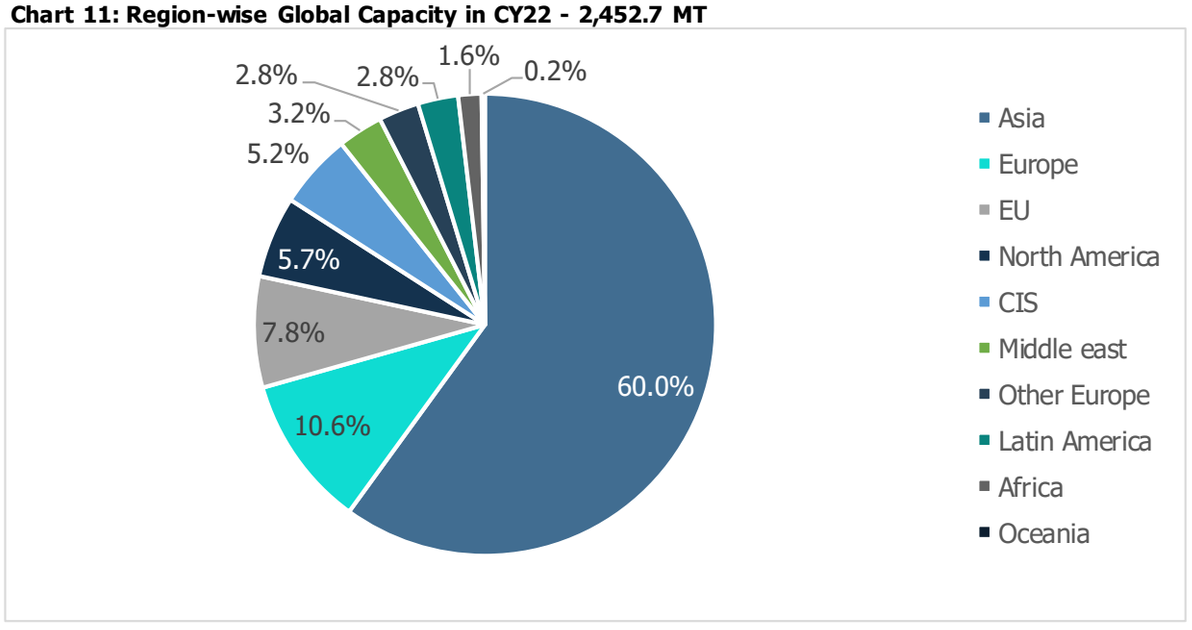
Chart 10: Global Per Capita Consumption (in kg)



Source: World Steel Association

Further, the global steel production capacity reached 2,452.7 million tonnes (MT) in CY22 with Asia accounting for the largest share of 60%. China holds a dominant position in steelmaking capacity, production, and consumption, boasting the highest steel production capacity globally, followed by India and Japan. Additionally, the European Union, North America, Latin America, the Middle East, and Oceania also contribute significantly to the global steel production capacity.

Chart 11: Region-wise Global Capacity in CY22 - 2,452.7 MT



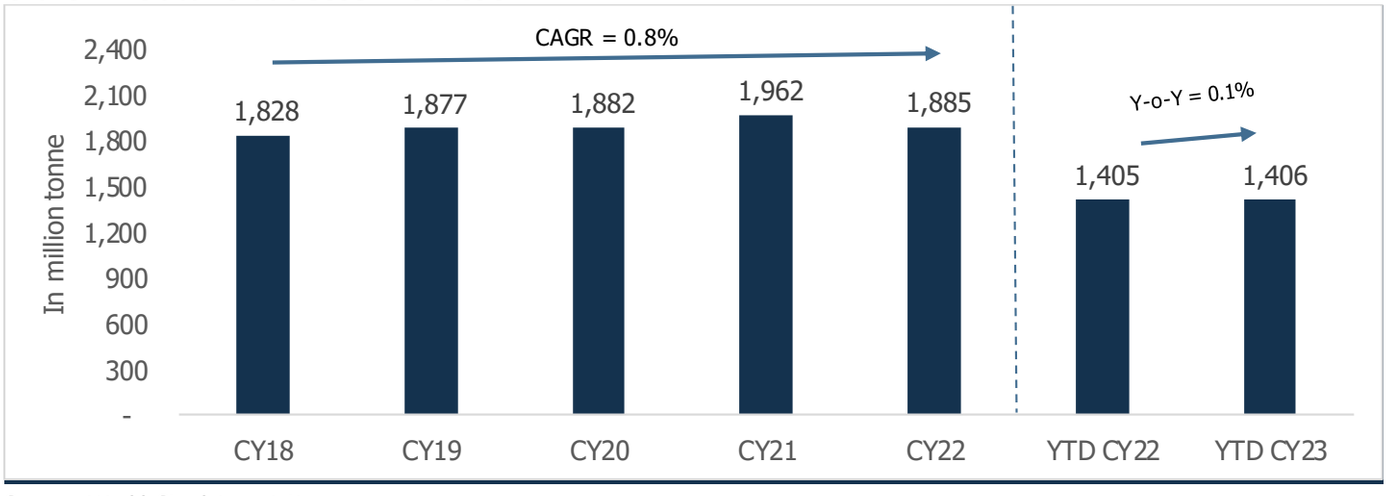
Source: Organisation for Economic Co-operation and Development (OECD)

2.2 Global Crude Steel Production

The global crude steel production has grown at a 5-year CAGR of about 0.8% to 1,885 MT in CY22 from 1,828 MT in CY18. However, it declined by ~4% y-o-y in CY22 from 1,962 MT in CY21 due to a slowdown in China, monetary tightening in the United States and Europe, inflationary pressures leading to increased input costs, and supply chain disruptions caused due to the Russia-Ukraine war.

During YTD CY23 (January 2023-September 2023), the production of global crude steel remained flat corresponding to the same period in CY22.

Chart 12: Global Crude Steel Production



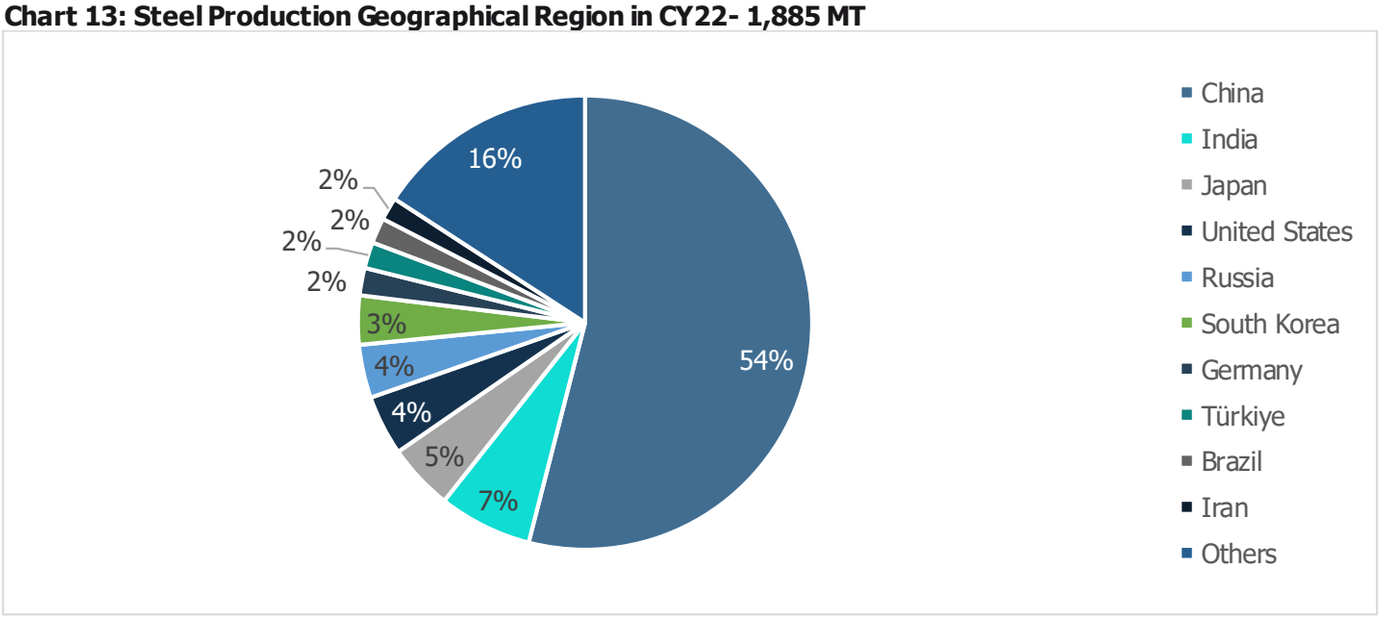
Source: World Steel Association

Note: YTD CY22 refers to the period from January 2022-September 2022
YTD CY23 refers to the period from January 2023- September 2023

Further, China continued to be the largest crude steel producer in CY22, accounting for 54% share. However, Chinese production declined by 2% y-o-y to 1,018 MT in CY22 as compared to 1,035 MT in the previous year due to lockdowns and restrictions enforced in the country due to the COVID-19 outbreak and a slowdown of its real estate market. China is also cutting down their production due to environmental concerns.

Whereas India was the second-largest producer of crude steel in CY22 with a 7% share, followed by Japan with a 5% share. The USA and Russia accounted for a 4% share each in the total production during CY22.

Chart 13: Steel Production Geographical Region in CY22- 1,885 MT



Source: World Steel Association

2.3 Global Finished Steel Consumption

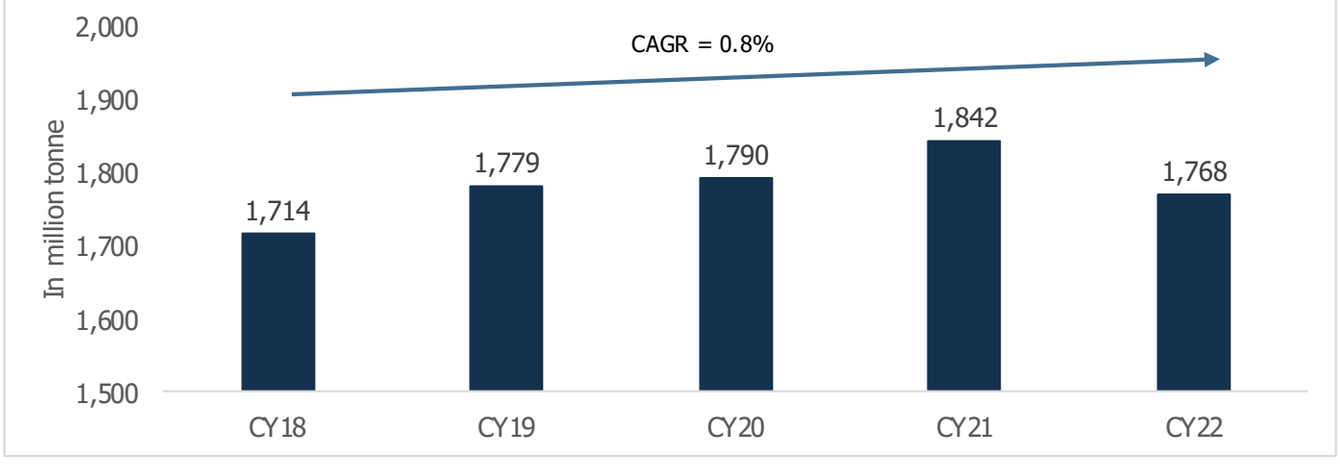
Steel is used in industries like energy, construction, automotive, transportation, infrastructure, packaging, and machinery. There was a strong recovery in finished steel consumption post-COVID-19. In developed economies like the USA, Europe, Japan, and South Korea, the demand was driven by the automotive and durable goods sectors.

The global finished steel consumption has increased at a CAGR of nearly 0.8% from 1,714 MT in CY18 to 1,768 MT in CY22. However, the global consumption of finished steel declined by 4% y-o-y in CY22, because global production was affected due to a slowdown in China, monetary tightening in the United States and Europe, inflationary pressures which raised input costs, and supply chain disruptions caused due to the Russia-Ukraine war.

Further, the finished steel consumption in China was reduced on account of movement restrictions and lockdowns brought on by COVID-19, environmental concerns, and the target to lower carbon emissions. However, government support is expected to aid in the recovery of demand with the resumption of construction and real estate activities.

Moreover, the consumption of finished steel in India has been robust given increased investments in infrastructure and policy support by the government. Despite the inflationary pressures and uncertainties around the global economy, India witnessed a healthy demand from auto, consumer durables, capital goods, and real estate sectors.

Chart 14: Global Steel Demand



Source: World Steel Association

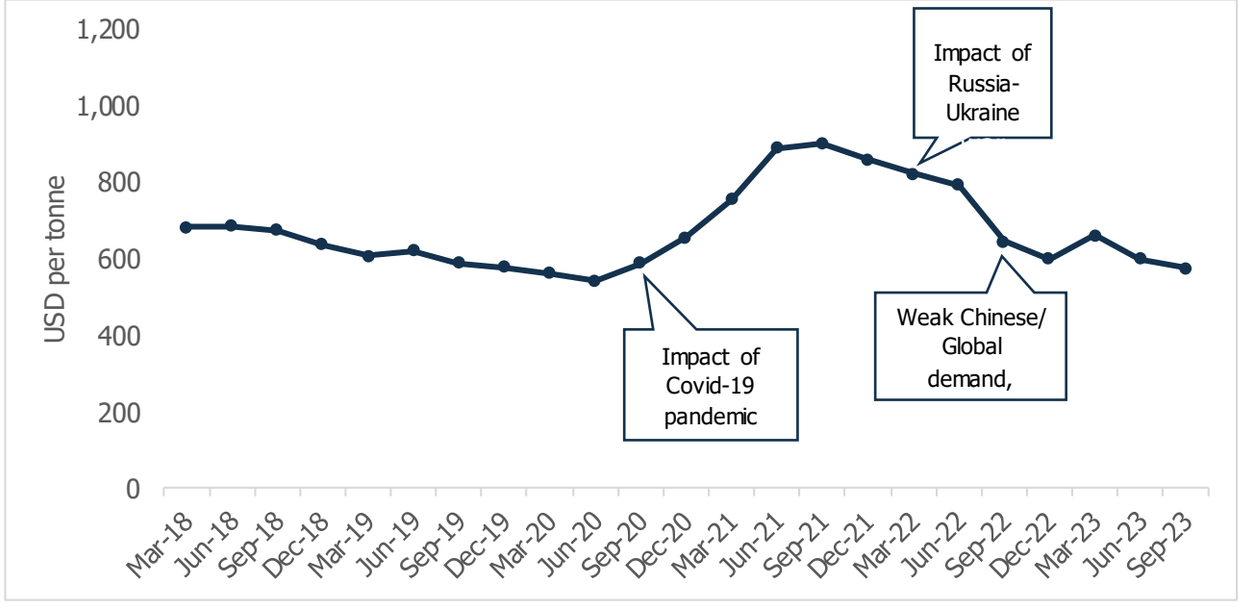
2.4 Trend in Global Steel Prices

The international steel prices remained in the range of USD 679 to USD 654 per tonne from March 2018 to December 2020. The prices started increasing in December 2020, primarily due to the supply disruptions caused by COVID-19 and high raw material prices. Escalated prices were further supported by the impact of the Russia-Ukraine war which commenced in February 2022.

Whereas the prices started declining post June 2022 and fell to pre-COVID levels of USD 597 per tonne in December 2022 given the weak demand from the largest consumer China due to lockdowns, COVID-19-related restrictions, and sluggish global demand. Also, the declining iron ore and coking coal prices have impacted international steel prices and caused the decline.

Post-December 2022, iron ore and steel prices started to rise as COVID-19 restrictions relaxed in China on expectations of demand recovery. However, the demand in China remains subdued, leading to correction in the global steel prices during March-September 2023. Accordingly, the global steel prices declined by 11% y-o-y and stood at USD 572 per tonne during the quarter ended September 2023.

Chart 15: Trend in International Steel Prices



Source: CMIE

2.5 Key Demand Drivers

- **Rapid Urbanization and Infrastructure Development:** The demand for steel is rising due to rapid urbanization in developing economies, further leading to infrastructure development including residential housing, commercial buildings, and transportation. This will drive construction and infrastructure-related projects, thereby increasing the usage of steel.

- **Growing Population:** The rising global population increases demand for various products, such as consumer goods, electronics, automobiles, etc., which, in turn, boosts the demand for steel. Additionally, growing disposable income and easy access to credit will also aid the growth in demand.

- **Government Investments in Infrastructure**: The investments in infrastructure by the governments in various countries will drive the demand for steel as it is essential in providing structural support. These investments provide job opportunities for individuals across the countries and contributes to the overall economic growth.

- **Thriving Automobile Sector:** The automobile sector is one of the major steel consumers globally. The steel demand is expected to be driven by the expanding global automobile industry, particularly in emerging countries. Furthermore, several

countries are transitioning to electric vehicles (EVs). EVs require sizable investments in battery manufacturing, which heavily relies on steel. Thus, this transformation is likely to boost the steel demand in the auto industry.

- **Environment Sustainability Awareness:** There is a growing need for sustainable development leading to the shift toward renewable energy sources, such as solar panels and wind turbines, which require substantial usage of steel. This will increase the global consumption of steel.

- **Growing Demand for Reconstruction and Replacement**: The steel demand for replacement and maintenance activities is on the rise. There is a regular need to replace existing infrastructure, mainly water and transportation infrastructure, and industrial facilities to provide better facilities to the individuals across the economies.

2.6 Key Challenges

- **Global Slowdown:** According to the International Monetary Fund (IMF), the global economic growth for CY23 is estimated at 3%, down from 3.5% in CY22, a de-growth of about 14.3%. This is largely due to the turbulence in the financial sector, geopolitical tensions, supply chain disruptions, tightening monetary policies, persistent inflation, and hikes in interest rates. The slowdown is expected to continue in CY24 and the growth rate for the same is projected at 2.9%. The decline in economic activity may lead to reduction in steel consumption.

- **Availability of Raw Materials and Price Volatility:** The availability of raw materials, such as iron ore and coking coal, is critical in the steel industry. The supply chain disruptions caused by the onset of COVID-19 resulted in many fluctuations in the price trend of raw materials. Additionally, the prices were affected by the Russia-Ukraine war, impacting the steel industry operations and profitability of the players. Volatility in availability and price of raw materials may impact the steel producers in future.

- **Trade Barriers:** Tariffs, import restrictions on trade, and export bans by governments worldwide, may hamper the growth of the steel industry, causing disruptions in trade globally.

- **Environmental Concerns and Regulations:** The production of steel involves releasing high carbon emissions. Steel manufacturers are under pressure to adopt cleaner technologies and comply with rigid environmental regulations as governments globally strive to decrease their carbon footprint and fulfil climate change commitments.

  Moreover, the recent implementation of the Carbon Border Adjustment Mechanism (CBAM) – a tariff on carbon-intensive imports, which is aimed at preventing carbon leakage commenced in October 2023 by the European Union (EU), is likely to impact global trade market competitiveness. The first phase of CBAM will cover the iron & steel, cement, aluminium, fertilizer, electricity, and hydrogen sectors and the first reporting period for importers is 31st January 2024.

2.7 Impact of Russia-Ukraine War on World Steel Trade

In CY21, Russia and Ukraine collectively contributed around 5% to the global steel production, accounting for 10.5% of global steel exports. However, the ongoing war between these two countries – both significant steel exporters – has severely impacted steel trade in the region.

Since February 2022, the conflict has disrupted the supply chain, leading to commodity shortages and increased production & transportation costs. Several steel plants in Ukraine have ceased operations, while those still in operation face challenges in transportation. As a result, outbound shipments from Ukraine witnessed a significant year-on-year decline of 57.5% in CY22.

Furthermore, Russia faced export challenges due to sanctions imposed by more than 30 Western countries. Nevertheless, the impact on Russian steel exports has been somewhat mitigated by increased exports to China, India, and Turkey, as Russia has offered lower product prices compared to European regions. At the same time, outbound shipments of steel from Russia experienced a year-on-year decline of 34.3% in CY22. Additionally, according to the World Steel Association, domestic steel demand in Russia has been affected by the sanctions, particularly in key end-user sectors such as construction and automotive.

Several global steel companies have discontinued their business operations in Russia due to these challenges. These include ArcelorMittal (Europe), Hyundai Steel (Korea), Nippon Steel (Japan), Tata Steel (India), and Steel Dynamics Inc (USA),

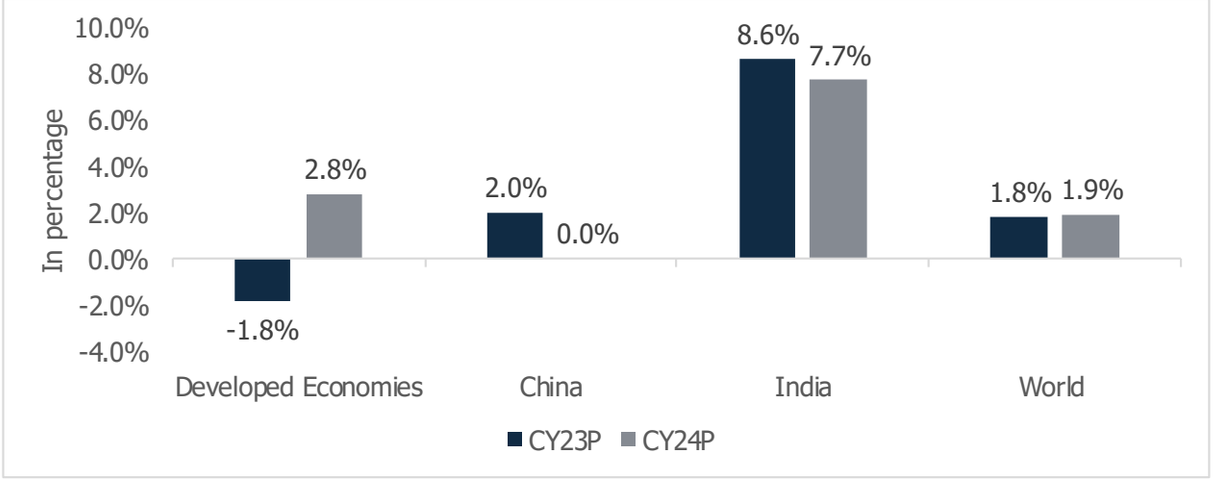
among others. As a result, Russia and Ukraine's crude steel production declined by 7.2% and 70.7% y-o-y, respectively, in CY22.

Moreover, the demand for steel in these regions has been improving in CY23 despite ongoing dynamics, majorly attributed to the construction sector in Ukraine. Whereas the Russian economy is expected to recover moderately due to government measures. However, the escalation of the war may impede trade and induce a decline in demand.

2.8 Outlook of Global Steel Consumption (CY23 & CY24)

The World Steel Association forecasts[2] the steel demand to increase by 1.8% y-o-y to 1,814.5 MT in CY23 and 1.9% y-o-y to 1,849.1 MT in CY24 compared to a decline of 3.3% in CY22. This growth will be led by a recovery in manufacturing activities, stabilization in the property sector in China, and easing of supply chain bottlenecks. However, persistent inflation and high-interest rates will limit the demand recovery.

Chart 16: Steel Demand Growth Projections



Source: World Steel Association
Note: P denotes Projections

The steel demand in China, accounting for over half of the global consumption, is expected to grow by 2% in CY23 and remain flat in CY24. Whereas the Chinese steel demand contracted in CY22 due to lockdowns, leading to the deceleration of the Chinese economy. Additionally, challenges in real estate intensified in CY22 and put pressure on construction activities. However, the situation is expected to improve and a slight pickup in the real estate sector is likely on account of government support. Subsequently, government-supported infrastructure investments will support steel demand.

After witnessing a growth rate of 9.3% in CY22, the steel demand in India is estimated to grow by 8.6% in CY23 and 7.7% in CY24. The growth momentum is expected to stay healthy on account of robust demand from the construction, capital goods, and auto sectors. Besides, government initiatives such as the Production Linked Investment (PLI) Scheme will aid in the overall growth of the industry.

Moreover, developed economies including the European Union (27), the United States, Japan, and South Korea, witnessed a 6.4% decline in steel demand in 2022 due to the Russia-Ukraine war, high energy costs, and rising interest rates. The World Steel Association expects demand from developed economies to further decline by 1.8% in 2023 on account of tight monetary policies and high energy prices. However, the steel demand is expected to increase by 2.8% in 2024. The growth will be supported by the alleviation of the war impact and supply chain disruptions in the European Union & the United Kingdom and recovery in manufacturing & residential construction activities.

[2] Worldsteel Short Range Outlook October 2023 dated October 17, 2023

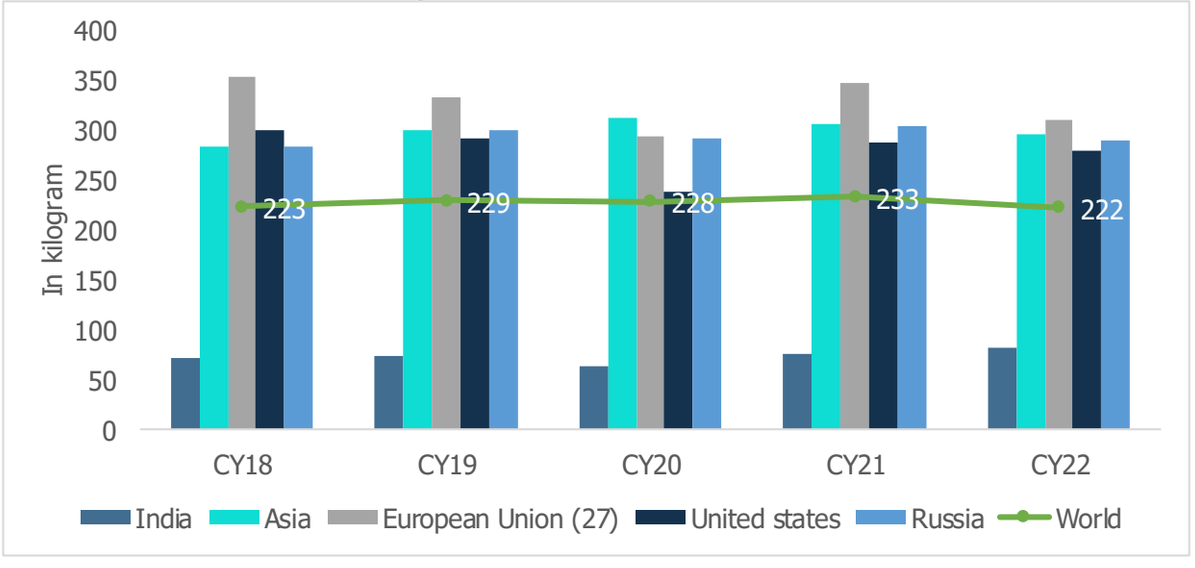
3 Domestic Steel Industry

3.1 Overview of the Indian Steel Industry

India is the second-largest steel producer in the world with an installed capacity of 161.3 MT in FY23. It is also the second-largest consumer of finished steel[3] with a consumption of 120 MT in FY23. The Indian steel sector growth over the years has been attributed to the domestic availability of raw materials such as iron ore and cost-effective labour. Also, the industry has benefitted from domestic demands in sectors such as construction, real estate, and automobiles. Whereas the vast coastline has enabled exports and imports, making India one of the leading countries in the global steel industry.

Further, the per capita finished steel consumption in India was 81.1 kg in CY22, significantly lower than the world average of 222 kg per capita. The National Steel Policy 2017 envisages that per capita finished steel consumption will increase to 158-160 kg by FY31. In addition, steel has an output multiplier effect of 1.4x on GDP and an employment multiplier effect of 6.8x[4] in India. Thus, the steel industry has significant domestic potential and is expected to play a key role in the future economic growth of the country.

Chart 17: Finished Steel Use Per Capita



Source: World Steel Association

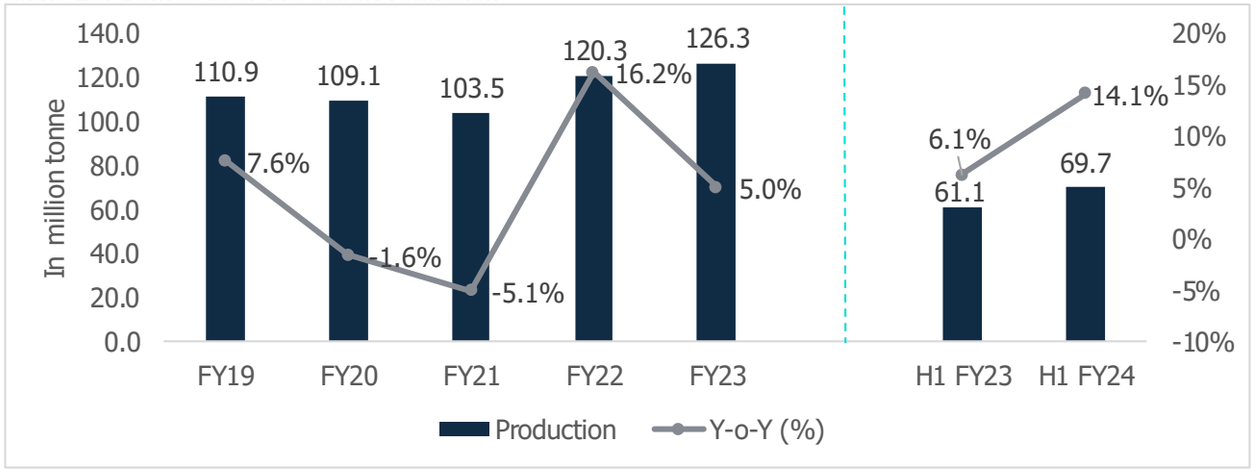
3.2 Domestic Crude Steel Production

The domestic crude steel production has grown at a CAGR of 3.3% in the past five years to reach 126.3 MT in FY23 from 110.9 MT in FY19. Large steel manufacturers' capacity utilization has been in the range of 80% to 90% in FY23 and most players have announced the expansion of crude steel capacities. The National Steel Policy 2017 envisages achieving 300 MT of production capacity from the current level of 153-157 MT to cater to the expected steel demand of 230 MT by FY31.

The crude steel production in India increased by 14.1% y-o-y to 69.7 MT in H1 FY24 (April 2023-September 2023) from 61.1 MT in H1 FY23 (April 2022-September 2022).

[3] Finished steel includes both long, flat products and specialty steel
[4] National Steel Policy 2017

Chart 18: Domestic Crude Steel Production



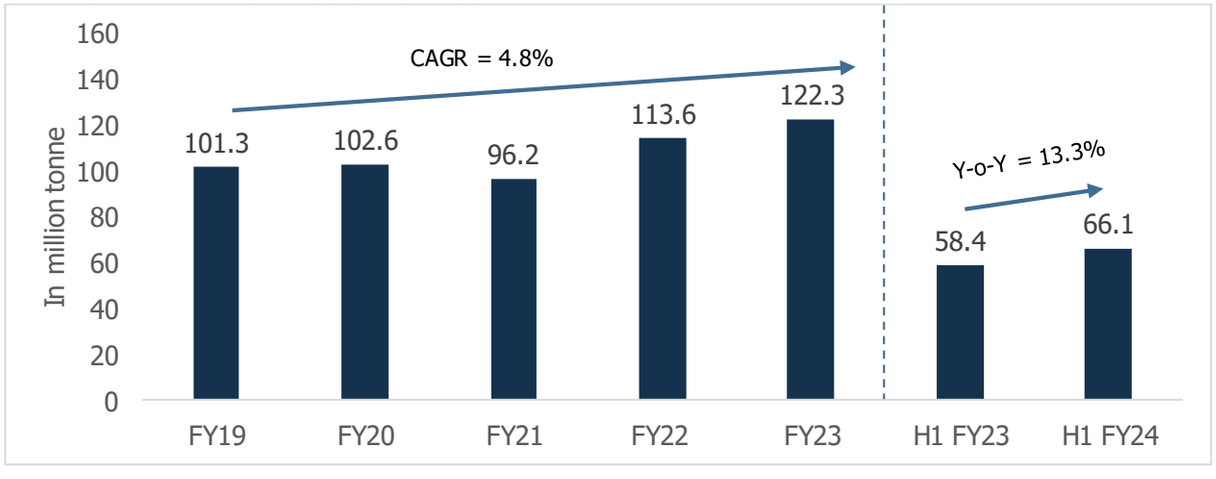
Source: CMIE
Note: H1 FY23 refers to the period from April 2022-September 2022
H1 FY24 refers to the period from April 2023- September 2023

3.3 Domestic Finished Steel Production and Consumption

In the last 5 years, the finished steel production has grown at a CAGR of 4.8% to 122.3 MT in FY23 from 101.3 MT in FY19. The growth in production has been supported by the rising domestic steel consumption due to increasing economic activities in the country. This is further supplemented by increased infrastructure and construction spending by the government and a rise in automobile and consumer durable demand, among others.

During H1 FY24, the production of finished steel grew by 13.3% on a y-o-y basis, backed by strong demand in the domestic market.

Chart 19: India's Finished Steel Production

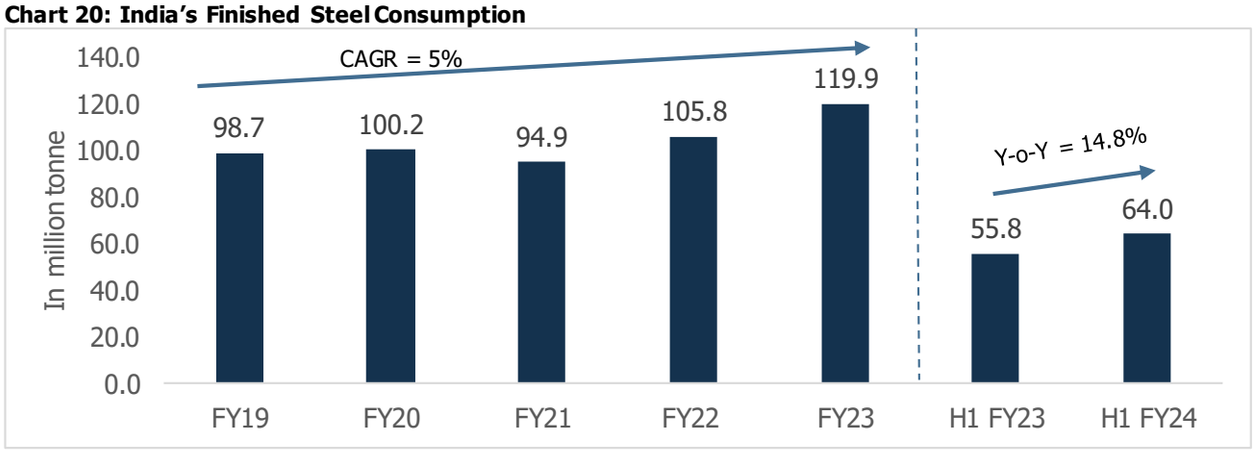


Source: CMIE
Note: H1 FY23 refers to the period from April 2022-September 2022
H1 FY24 refers to the period from April 2023- September 2023

The domestic finished steel consumption has increased at a CAGR of 5% to 119.9 MT in FY23 from 98.7 MT in FY19. After a steady increase in steel production, India witnessed a de-growth of 6.3% y-o-y in FY21 due to the outbreak of COVID-19. The rebound in domestic demand from the impact of COVID-19 in the previous financial years, continuous investment in infrastructure and policy support by the government, and pick-up in real estate construction during FY23 have led to an increase in consumption of finished steel to 119.9 MT, implying a y-o-y growth of 13.3%.

During H1 FY24, the consumption of finished steel reported a growth of 14.8% y-o-y on account of increased demand from the infrastructure and real estate sectors, mainly due to the pre-election year.

Chart 20: India's Finished Steel Consumption



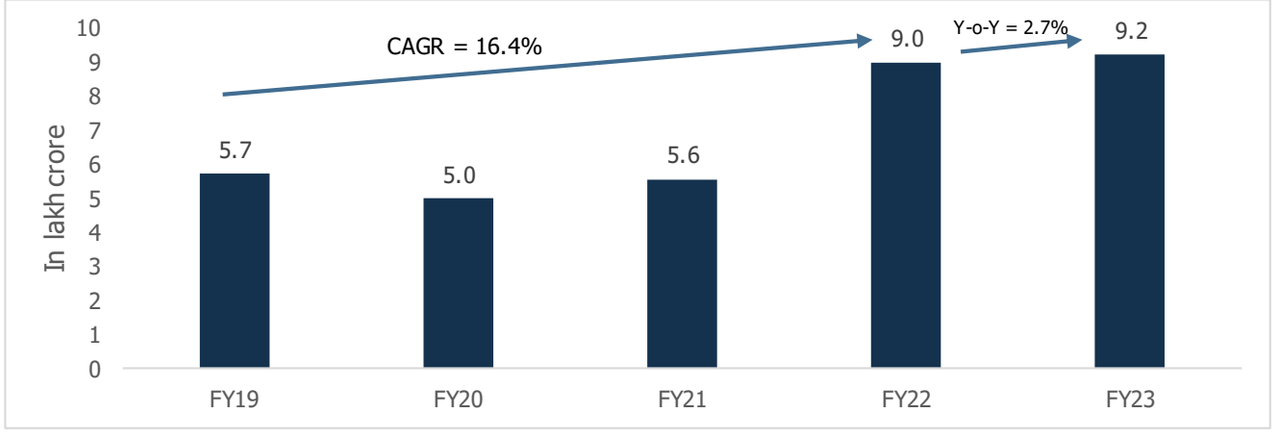
Source: CMIE

Note: H1 FY23 refers to the period from April 2022-September 2022
H1 FY24 refers to the period from April 2023- September 2023

Size of Industry in terms of Consumption in Value Terms

The steel industry in India has grown steadily with a CAGR of 16.4% from FY19-FY22 in value terms, driven by volume and realisation growth. The size of the industry reached Rs. 9 lakh crore in FY22 as the average prices of finished steel rose by 45% on a y-o-y basis. During FY23, the size of the industry stood at 9.2 lakh crore, indicating a growth of 2.7% y-o-y. This growth can be attributed to increased volumes of finished steel by 13.3% y-o-y and high prices of steel.

Chart 21: Finished Steel Industry Size



Note: Finished steel consumption (In tonne) and prices of average finished steel (Rs/tonne) have been considered for computing the size of the industry

3.4 Trend in Finished Steel Trade

Exports:

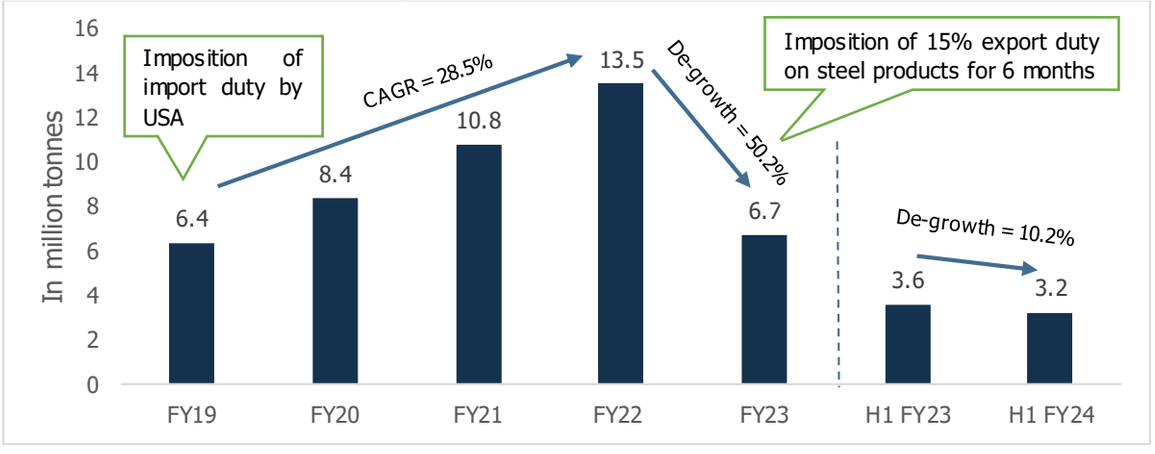
Finished Steel exports from India have contributed to the total offtake of steel, in addition to the domestic demand, supported by India's increasing capacity and production. For instance, exports increased at a CAGR of 28.5% over the period of 4 years from 6.4 MT in FY19 to 13.5 MT in FY22. In addition, India was a net steel exporter for three years FY20-FY22.

Further, exports witnessed a reversal in trend during FY23 after an upward trend of exports in 3 consecutive years, i.e., FY20, FY21, and FY22 and declined to 6.7 MT compared to 13.5 MT in FY22, a sharp fall of 50.2% y-o-y. This was mainly due to the imposition of a 15% export duty on steel products by the government from May 2022 to November 2022, which made exports from India less competitive. Exports were also impacted by weak international demand, continued geopolitical tensions, and inflationary headwinds globally.

Accordingly, the sharp reversal in the steel trade led to a withdrawal of export duty on steel products by the government in November 2022. Although the shipments have increased sequentially during the initial months post the export duty removal, export growth has been constricted due to the weak demand in European nations mainly in Italy, the UAE, and Belgium who are the top importers of Indian finished steel products. In addition, the decline in shipments to Spain, Germany, Turkey, and the USA has affected the overall outbound shipments.

Moreover, during H1 FY24, the exports plunged to 3.2 MT from 3.6 MT in H1 FY23, a de-growth of around 10% on a y-o-y basis. Also, India turned a net importer of steel during Q2 FY24 with increasing inbound shipments by about 8.2% y-o-y. Further, the exports dropped to 157 thousand tonnes in September 2023, the lowest in the last 5 years. Accordingly, the exports may not reach the highs achieved in FY22 due to sluggish global demand and an increase in steel exports from China due to slower than expected ramp up in local demand in CY23

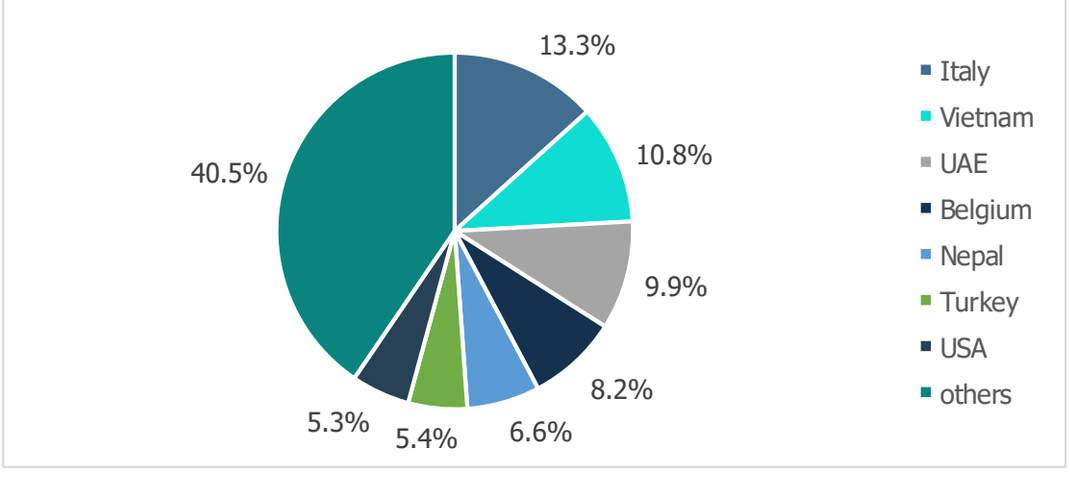
Chart 22: India's Finished Steel Exports



Source: CMIE

The exports to the top 5 countries (Italy, Vietnam, UAE, Belgium, and Nepal) accounted for 49% of the total outbound shipments from India during FY23. Italy, Belgium, and UAE continued to remain the leading export destinations from India. Among others, the shipments to the USA and Turkey constituted 5.3% of each of the total exports from India.

Chart 23: Country-Wise Exports of Finished Steel during FY23



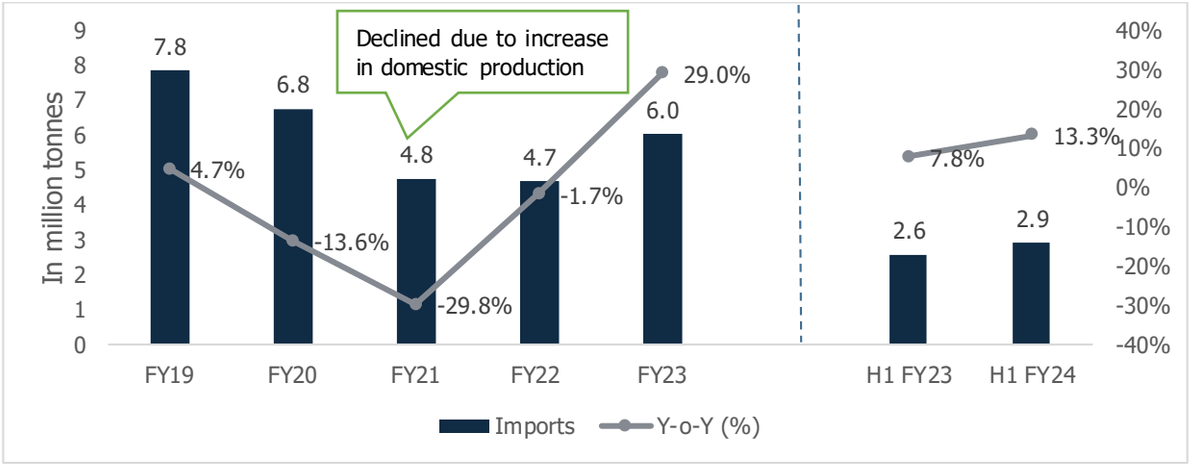
Source: CMIE

Imports:

India mainly imports special-grade steel used in end-user segments such as automobiles, defence, shipbuilding, power, railways, etc., and is witnessing good traction in the domestic market, leading to growth in imports.

The finished steel imports declined from 7.8 MT in FY19 to 4.7 MT in FY22. This is accredited to a healthy increase in domestic supply. However, during FY23, India's finished steel imports grew by 29% y-o-y to 6 MT due to the rise in low-cost imports from Russia. In H1 FY24, the finished steel imports have increased by 13.3% y-o-y to 2.9 MT.

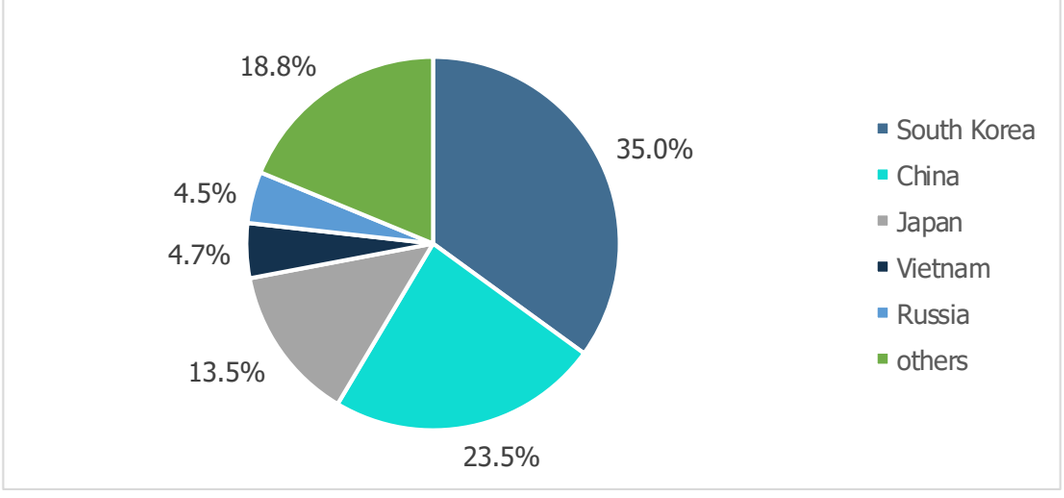
Chart 24: India's Finished Steel Imports



Source: CMIE

South Korea, China, and Japan continue to be the leading suppliers to India with a 72% share in the total imports of finished steel in FY23. The inbound shipments from Russia increased drastically by 544% in FY23 as compared to the previous year and accounted for a 4.5% share of the total imports to India. During 5M FY24 (April 2023 to August 2023), the imports from Russia decreased by 33% from 49,000 tonnes to 33,000 tonnes during 5M FY23 (April 2022 to August 2022).

Chart 25: Country-Wise Imports of Finished Steel during FY23



Source: CMIE

3.5 Price Trends

Trend in Finished Steel Prices

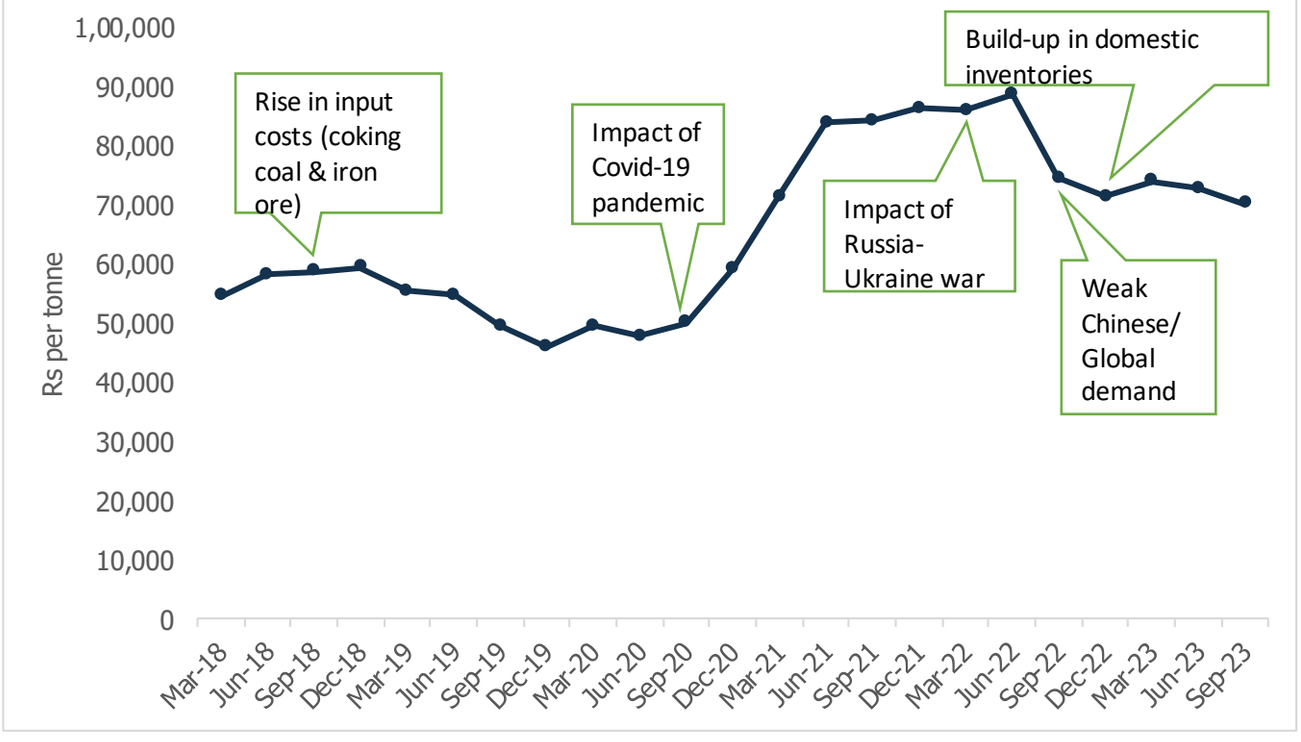
Domestic steel prices have followed global prices directionally. They remained range-bound between March 2018 (Rs. 54,473 per tonne) to June 2019 (Rs. 54,669 per tonne). However, they started declining as the economy was hit by the pandemic. During FY21, the average domestic finished steel prices peaked at Rs 71,157 per tonne as of March 2021. Since then, the prices increased throughout FY22 on account of a revival in domestic demand as economic activities began to pick up after the easing of restrictions and lockdowns.

During FY22, prices were impacted by the geopolitical tension between Russia and Ukraine and stood at Rs. 85,820 per tonne as of March 2022. The geopolitical crisis continued and the prices were further pushed to Rs. 88,498 per tonne in the June 2022 quarter. The escalation in prices was also due to increased coking coal and iron ore prices globally. However, after a sharp rise, the prices declined by around 16% in the quarter ending September 2022 compared to the previous quarter.

Furthermore, the prices fell to Rs 71,326 per tonne in December 2022. This decline was caused by the imposition of export duty on a range of finished steel products from the period May 2022 to November 2022, leading to lower exports and increased domestic inventories. In addition, the softening of iron ore and coking coal prices affected the steel prices in the domestic market.

Moreover, the prices observed a downward trend from the quarter ended March 2023 and fell to Rs. 70,001 per tonne as of September 2023, a decline of around 5% as compared to March 2023 and 6% on a y-o-y.

Chart 26: Domestic Average Finished Steel Prices



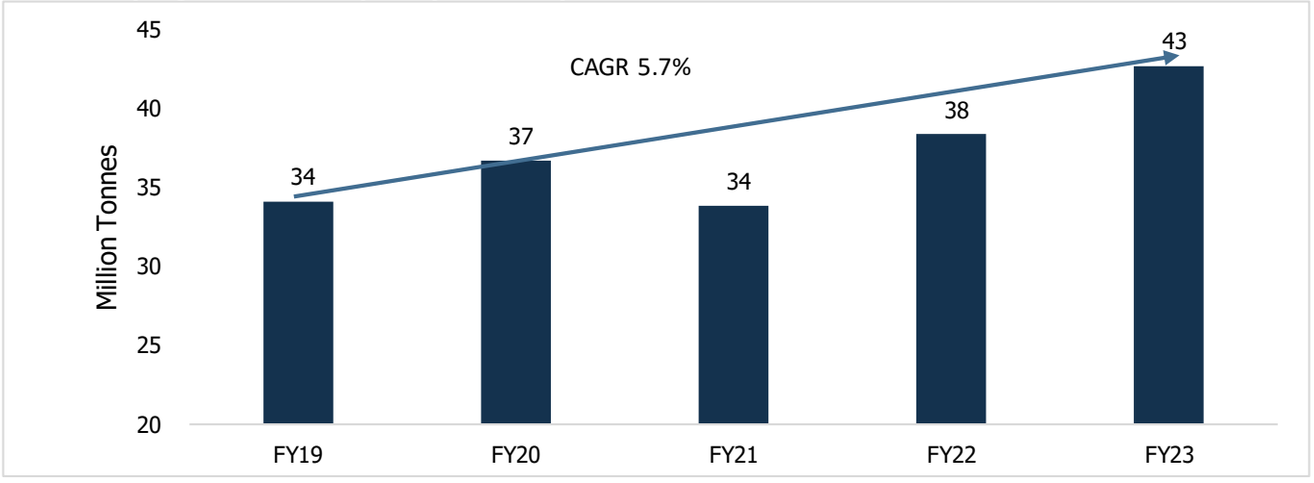
Source: CMIE

3.6 Trend in India's Consumption of Sponge Iron, Billets and TMT Bars/Rods

Sponge Iron

The domestic sponge iron consumption has grown at a CAGR of 5.7% over the past five years from 34 MT in FY19 to 43 MT in FY23.

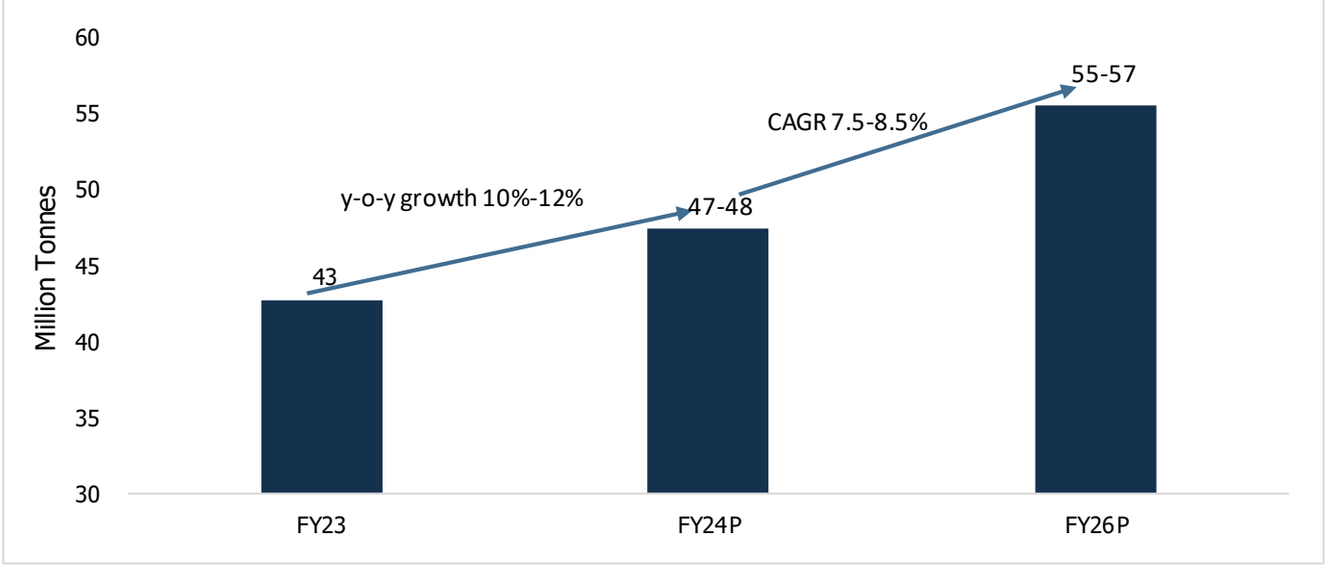
Chart 27: Sponge Iron Consumption (FY19-FY23)



Source: JPC, CareEdge Research

CareEdge Research expects sponge iron consumption to grow by 10-12% y-o-y in FY24. This growth is likely to be driven by a ramp-up in infrastructure activity and upcoming elections. In the medium term, the growth is likely to moderate and grow at a CAGR of 7.5-8.5% between FY24 and FY26. The moderation in growth is likely to be due to a high base and moderation in infrastructure activity.

Chart 28: Sponge Iron Consumption (FY23-FY26P)

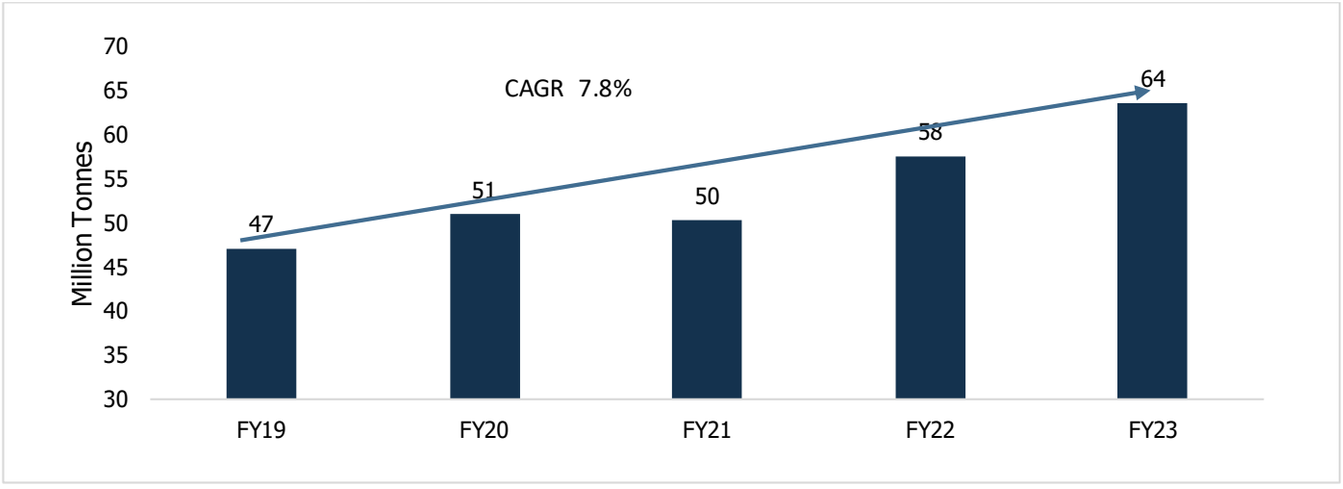


Source: JPC, CareEdge Research Forecasts

Billets

Billets consumption has grown at a CAGR of 7.8% over the past five years from 47 MT in FY19 to 64 MT in FY23.

Chart 29: Billets Consumption (FY19-FY23)

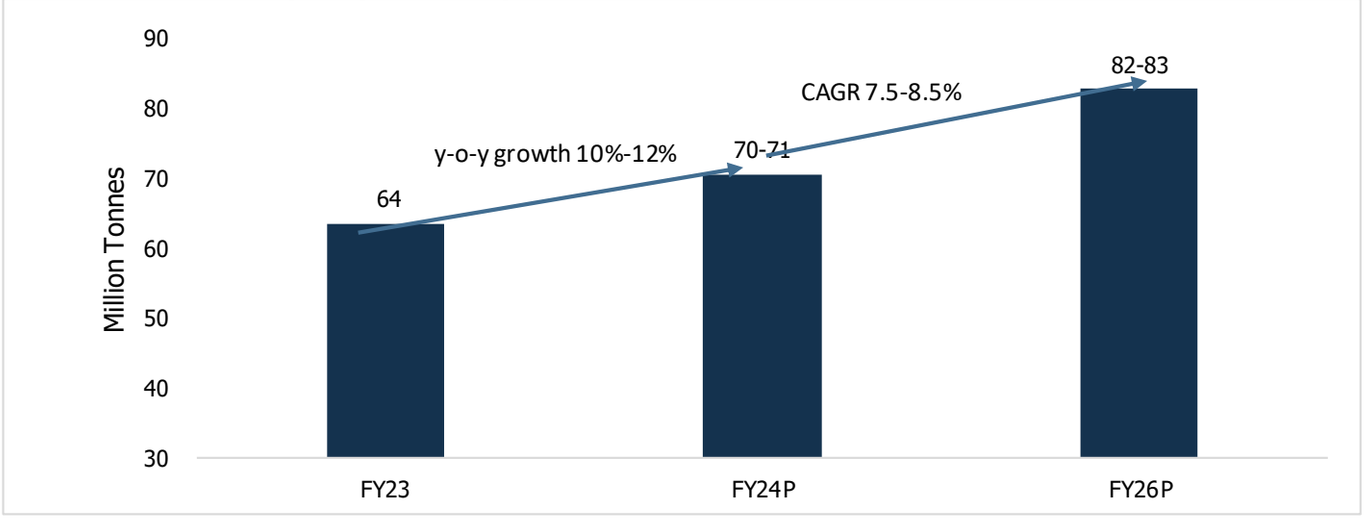


Source: JPC, CareEdge Research

Note: Billets consumption has been derived from non-flat steel consumption over the same period

CareEdge Research expects billets consumption to grow by 10-12% y-o-y in FY24. In the medium term, the growth is likely to moderate to a CAGR of 7.5-8.5% between FY24 and FY26 on account of high base and expected moderation in capital expenditure post the elections.

Chart 30: Billets Consumption (FY23-FY26P)

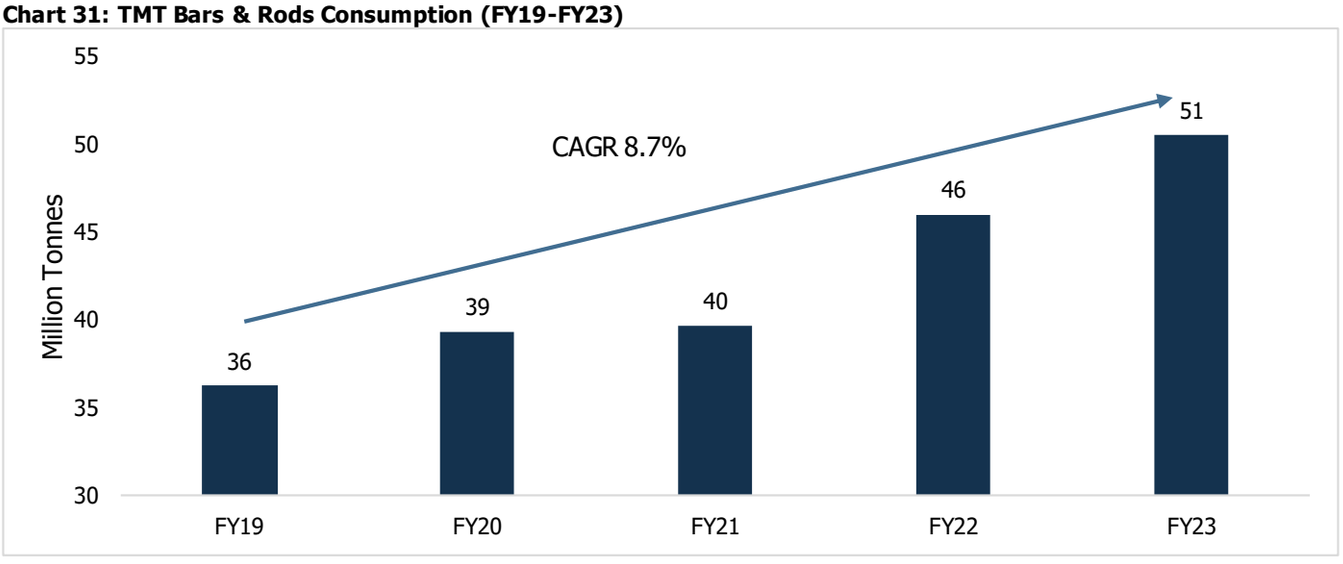


Source: JPC, CareEdge Research

TMT Bars/Rods

TMT Bars and Rods consumption has grown at a CAGR of 8.7% over the past five years from 36 MT in FY19 to 52 MT in FY23.

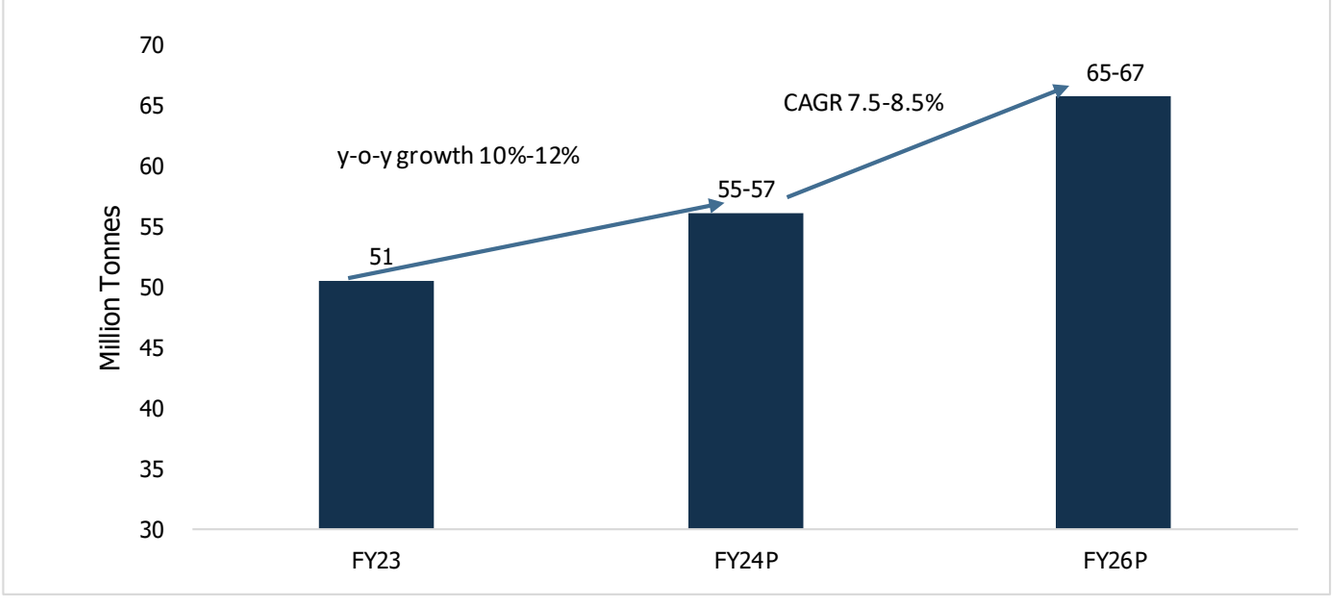
Chart 31: TMT Bars & Rods Consumption (FY19-FY23)



Source: JPC, CareEdge Research

CareEdge Research expects TMT bars & rods consumption to grow by 10-12% y-o-y in FY24. In the medium term, the growth is likely to moderate to a CAGR of 7.5-8.5% between FY24 and FY26 on account of high base, expected moderation in capital expenditure post the election period.

Chart 32: TMT Bars & Rods Consumption (FY23-FY26P)



Source: JPC, CareEdge Research

3.7 Key TMT Bars and Wire rods Players in India (organized and unorganized)

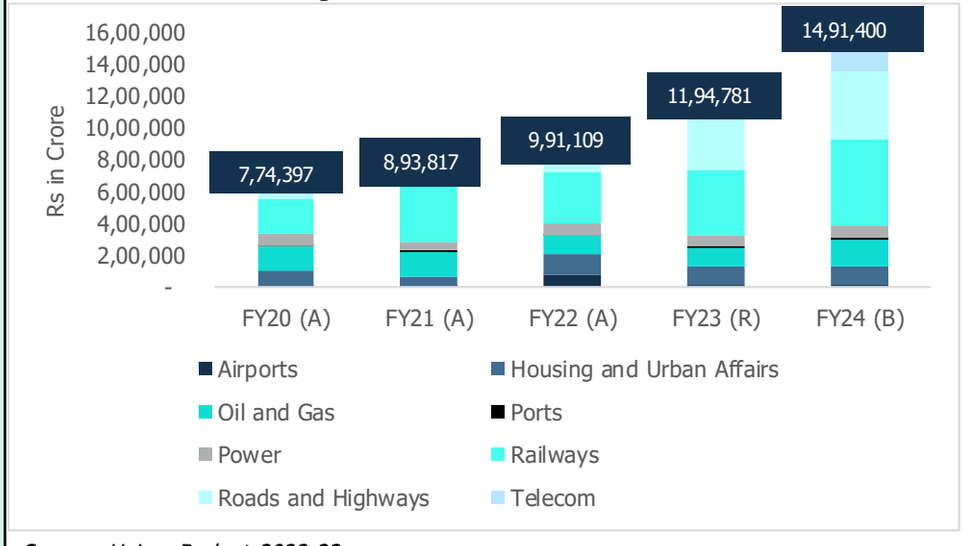
TMT bars are high strength re-enforcement bars with a hard-outer core and a soft inner core. They are manufactured through a process called thermo-mechanical treatment. They are mainly used in construction and real estate projects. TMT bars are supplied in India by multiple players including small unorganized players. Most large organized players manufacture TMT bars as part of their forward integration. However, most of the unorganized players manufacture TMT bars using steel billets which are then rolled into TMT bars in the rolling mills.

Table 4: Trend in TMT Bars Production by Key Players (in MT)

	FY19	FY20	FY21	FY22	FY23
Steel Authority of India Ltd	2.4	2.5	2.1	3.1	3.6
Vizag Steel Plant	3.6	3.0	2.5	3.4	3.2
Tata Steel Limited Group	3.7	3.4	2.7	3.3	3.5
JSW Group	3.3	3.3	2.8	3.5	3.7
Jindal Steel & Power Ltd	1.1	1.7	1.7	2.1	2.3

Source: JPC, CareEdge Research

3.8 Key Demand Drivers

Segments	
construction and infrastructure	• One of the major growth drivers of the steel industry is the infrastructure investment thrust by the Government of India. In the Union Budget 2023-24, the government continued its focus on infrastructure development, allocating Rs 10 lakh crore toward infrastructure capital expenditure, an increase of 33% over the Union Budget 2022-23 allocation. Whereas total allocation toward infrastructure, including investments in public enterprises, stood at Rs. 14.9 lakh crores, an increase of 24.8% over revised estimates of 2022-23. • The government has expanded the National Infrastructure Policy (NIP) to 7,400 projects from 6,835 projects and announced plans for the National Monetization Pipeline and Development Finance Institution (DFI) to improve the financing of infrastructure projects. • The NIP covering rural and urban infrastructure entails investments to the tune of Rs. 111 lakh crore, which is undertaken by the central government, state governments, and the private sector for FY20-25. • Moreover, the alignment of PM Gati Shakti National Master Plan and NIP will aid in debottlenecking hurdles for faster execution of projects. • The budget towards infrastructure grew on a CAGR of about 18% in the past 5 years from FY20 to FY24. **Chart 33: Allocation of Budget Toward Infrastructure***  *Source: Union Budget 2022-23* *Note: A – Actual budget; R- Revised budget; B- Budgeted* **Including investments in public enterprises*
road infrastructure	• India's road infrastructure has seen consistent improvement in the last few years. Connectivity has improved and road transportation has become a focus of rapid development. • Total highway construction in India during FY23 was 10,993 km compared to 10,457 km in FY22, indicating a construction run rate of 30 km per day.

	• In H1FY24 the construction was at 3,567 km compared to 3,559 km from H1FY23 with rate of construction at 20 km per day. • The highway construction activity dropped from 4,092 km in H1FY23 to 2,286 km in H1FY24 due to the general elections scheduled in the next year. • This slowdown can be attributed to an increase in input cost, longer-than-usual monsoon, and problems related to land acquisition and environmental clearance. • About 12,000 km of highways are expected to be constructed in FY24 at an estimated capital expenditure of Rs 4 lakh crore.
 **Residential Real - Estate**	• In FY23, the residential real estate market witnessed steady growth with increased sales momentum, supported by past inventory levels and continued new project launches specifically in the affordable and mid-size segments. • The housing market in general is seeing growth due to the increasing commercial activities, the need for upgraded infrastructure and living spaces, and an improved economic scenario. • Growth in various sectors like BFSI and e-commerce segments, an increase in savings because of the work-from-home trend in the last 2 years, and the rising demand for better spaces to live, have led to an increase in first-time home buyers. There has also been a rise in the mid-segment housing projects due to increased urbanization and per capita income. • Government initiatives like Pradhan Mantri Awas Yojna (PMAY), the Urban Development Plan, and the digitization of land records have contributed to the sector's growth. Whereas Rural and Urban housing construction under the Pradhan Mantri Awas Yojana has gained traction in FY23. • Under the PMAY scheme of the Union Ministry of Housing and Urban Affairs, more than 1.20 crore houses have been sanctioned under the PMAY-Urban, out of which 73.87 lakhs have been completed as of May 10 2023 and the rest are under construction. • In addition, about 2.85 crore houses have been sanctioned under PMAY-Gramin out of which 2.25 crore have been completed.
 **Commercial Real Estate**	• In FY23, the commercial real estate market witnessed a boom with healthy demand growth from office and retail segments, backed by strong growth in the e-commerce industry and India emerging as the fastest-growing business and IT hub. • The demand for office space will be driven by the expansion of the co-working segment, an increase in hiring across various sectors like e-commerce, services, etc., and rising connectivity due to the augmentation of infrastructure, and overall sound economic growth in India. • The absorption of commercial real estate in India is expected to remain healthy in the near to medium term.

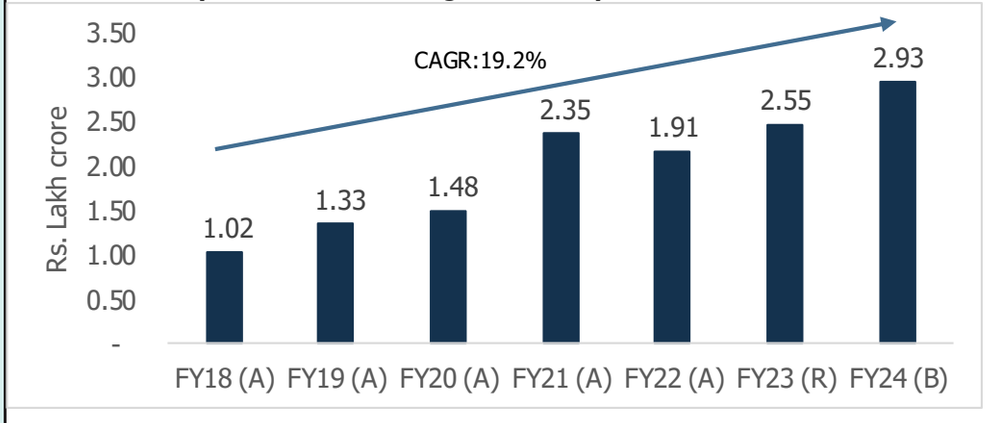
Airport infrastructure

- India has seen significant growth in the airport infrastructure sector with investments from both the government and private sector. The country has become the third-largest domestic civil aviation market in the world and has immense potential to grow further.
- The Ministry of Civil Aviation (MoCA) envisages 100 new airports to be built in the country over the next 10 to 15 years. To further improve regional air connectivity, the government has announced the revival of 50 additional airports, heliports, water aerodromes, and advanced landing grounds and allocated Rs 3,113 crore in the Union Budget 2023-24.
- Further, the government has envisaged an investment of more than Rs. 1.43 lakh crore in airports under the National Infrastructure Pipeline (NIP) over a period of 5 years (FY20-25).

Indian Railways

- Indian Railways is among the world's largest rail networks. Steel finds applications in rails, wagons, and coaches. The government has been increasing its focus on the augmentation of railways to reduce the cost & time of logistics and minimize the overall carbon footprint of the country as railways are more environment friendly compared to road transport.
- The CapEx for Indian Railways has increased substantially from an annual average CapEx of Rs. 45,980 crore during 2009-14 to Rs. 2,92,783 crore allocated in the 2023-24 budget. Whereas the budget towards railways grew at a CAGR of 19.2% from FY18 to FY24.
- The key focus areas have been the decongestion of the overutilised rail network, construction of new lines, doubling, tripling, and quadrupling of rail lines and purchase of rolling stock such as wagons, locomotives, coaches, etc.

Chart 34: Railways - Allocation of Budget over the years



Source: Budget Documents

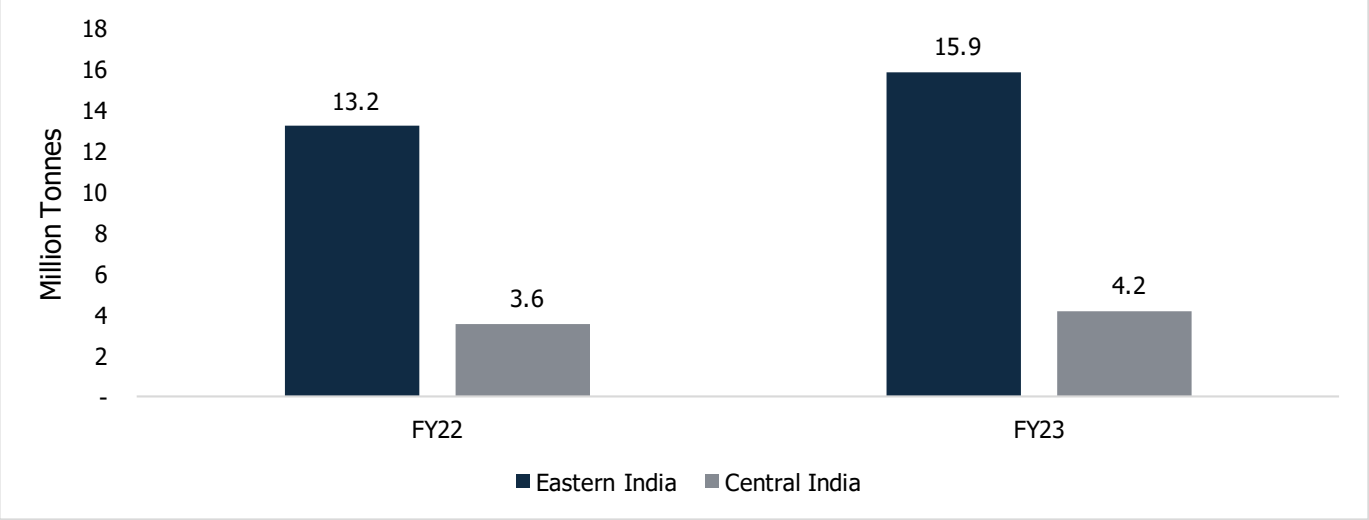
- The government proposes to launch 400 new Vande Bharat trains in the next 3 years along with the development of 100 Cargo Terminals over the next few years. Additionally, the construction of a Dedicated Freight Corridor (DFC) which are broad gauge rail network to be utilized exclusively for freight trains will increase the Railway's share in domestic freight movement.
- The western and eastern DFCs are 86% and 90% complete, respectively, and are expected to be commissioned by FY25. Also, the East Coast Corridor, the East-West Corridor, and the North-South Corridor are under the planning stage.

others	• The growing urbanisation will lead to increased demand for steel as it involves usage in the construction of buildings, pipes for water supply, improved drainage systems, waste treatment plants, elevators, etc. • On August 15 2019, the government launched the "Jal Jeevan Mission" programme, with an aim to provide safe and adequate drinking water through individual household tap connections by 2024 to all households in rural India. The mission has always witnessed a consistent allocation in the budget every year. • In the Union Budget 2023-24, the allocation toward the Jal Jeevan Mission has increased to around Rs. 70,000 crores from Rs, 60,000 crore in the previous budget. Under this programme, steel pipes will be used for the distribution of water due to their non-corrosion and non-rusting characteristics. This programme has already covered 61.4% of rural households in 3.9 years. • Another initiative 'One Nation, One Gas Grid' will attract new investments in India's natural gas infrastructure, which uses steel pipes. It is expected that the gas pipeline network, which is more than 22,000 km currently, will reach 35,000 km in the coming 4-5 years. The efforts of moving toward the gas-based economy alongside the implementation of city gas distribution networks are expected to augment the demand for pipes going forward.

3.8.1. Long Steel dispatched in Eastern and Central India

Long steel, also known as non-flats, includes TMT bars & rods, structural, and railway materials. Over the last two years, the dispatches of long steel in India's eastern region have seen steady growth, largely supported by increased dispatch from Bihar, Jharkhand, and Odisha.

Chart 35: Region-wise Long Steel Dispatches



Source: JPC, CareEdge Research

The long steel dispatches of the eastern region grew at 20.3% y-o-y in 2023 and reached nearly 16 MT. Whereas the long steel dispatches of the central region grew at 17.5% y-o-y in 2023 and reached around 4 MT.

3.9 Supply Review and Outlook

3.9.1 Industry Structure (Organized and Unorganized)

The organized sector significantly contributes to crude steel production. It comprises large, integrated steel plants that use advanced processes and technologies to produce high-quality steel products. The technologies include mainly the Blast Furnace-Basic Oxygen Furnace (BF-BOF) route and the Electric Arc Furnace route (EAF), which require huge investments as well as high operating capital and maintenance expenditure. These plants mainly utilize iron ore, coal, and other raw materials to manufacture a variety of steel products, including flat steel, long steel, and specialty steel.

For instance, the capital expenditure (CapEx) required for setting up a BF-BOF-based steel plant is usually around USD 1 billion per million tonnes. This sum of capital can only be invested by large steel players in the organized sector.

Whereas the unorganized sector comprises small-scale steel mills, also referred to as mini-mills or re-rollers. These are non-integrated mills that primarily utilize scrap metal as their raw material for steel production. These mills lack advanced technology and automation of processes, which may have an impact on their production efficiency and product quality.

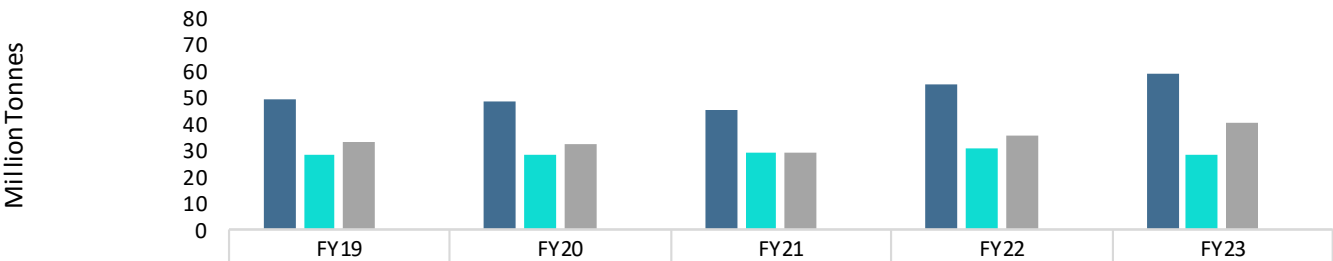
3.9.2 Indian Crude Steel Production by Technology

There are three types of technologies, namely oxygen route, electric arc furnace, and induction furnaces, used for the production of crude steel in India. The oxygen route, also known as basic oxygen furnace, is a blast furnace that turns carbon-rich hot metal or pig iron into steel. It is the preferred technology for the production of crude steel. Oxygen route-based crude steel production has grown at a CAGR of 4.4% between FY19 and FY23 to reach 58.8 MT in FY23 and accounted for 46.2% of the total crude steel produced in FY23.

Electric Arc Furnace (EAF) is a steel-making furnace, in which steel scrap is heated and melted by heat of electric arcs striking between the furnace electrodes and the metal bath. Electric Arc Furnace (EAF) accounted for 22.2% of total crude steel produced in FY23. Crude steel is produced by using electrical current to melt scrap steel, direct reduced iron, and/or pig iron, to produce molten steel. However, electric arc furnace-based crude steel production has de-grown from 28.5 MT in FY19 to 28.2 MT in FY23.

While induction furnaces convert steel scrap and sponge iron into liquid steel by induction heating. This further gets processed into billets, blooms, ingots, etc. The induction furnace-based crude steel production has grown at a CAGR of 5.1% between FY19 and FY23 to reach 40.2 MT in FY23 and accounted for 31.6% of the total crude steel produced in FY23.

Chart 36: Technology-Wise Crude Steel Production (FY19-FY23)



	FY19	FY20	FY21	FY22	FY23
Oxygen Route	49.5	48.6	45.1	54.6	58.8
EAF Units	28.5	28.4	29.4	30.5	28.2
Induction Furnaces	33.0	32.2	29.1	35.2	40.2
Total	110.9	109.1	103.5	120.3	127.2

Source: JPC, CareEdge Research

3.10 Key Challenges

- **Lack of Sustainable Raw Material Sources (Iron Ore and Coking Coal)**

Iron ore and coking coal are the key raw materials used in the steel production process. For every 1 tonne of steel produced through the BF-BOF[5] route, a suitable blend of 1.6-1.7 tonnes of iron ore and 0.6 tonne of coking coal is required. India largely depends on importing these raw materials for various uses.

India is self-sufficient in iron ore. However, it largely consists of low-grade deposits, which require beneficiation to make them suitable for use in steel plants. Accordingly, the availability of high-grade iron ore is limited in India. Moreover, a large quantity of iron ore fines produced in the mining process requires pelletisation before it can be used in steel plants.

Secondly, the limited availability of coking coal reserves is another challenge for the steel industry. Further, the domestically available coking coal has high ash content and is not suitable for direct use in the BF-BOF process. It has to be washed in washeries and then blended with imported coking coal to make it suitable for the BF process. At the same time, there is limited capacity for washeries. As a result, India largely depends on imports to meet the domestic demand for coking coal.

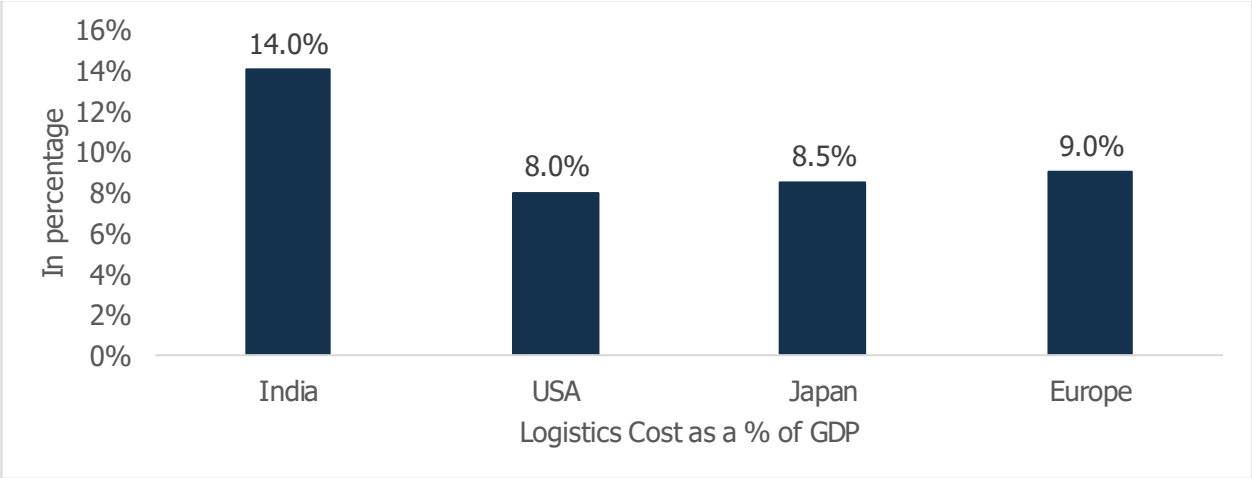
- **High Logistic Costs**

It is estimated that 3-3.5 tonnes of material needs to be transported for every 1 tonne of steel produced in India. The logistics cost is currently in the range of 4-5% of sales of the domestic steel players and fluctuates on the basis of the proximity of the steel plants to the iron ore and coking coal sources.

Further, logistics costs in India are significantly higher compared to global peers and account for about 14% of the GDP. The chart below shows the comparison of the share of logistics cost in GPD of India vs. developed economies.

[5] Blast Furnace – Basic Oxygen Furnace

Chart 37: Logistics Cost as a Share of GDP



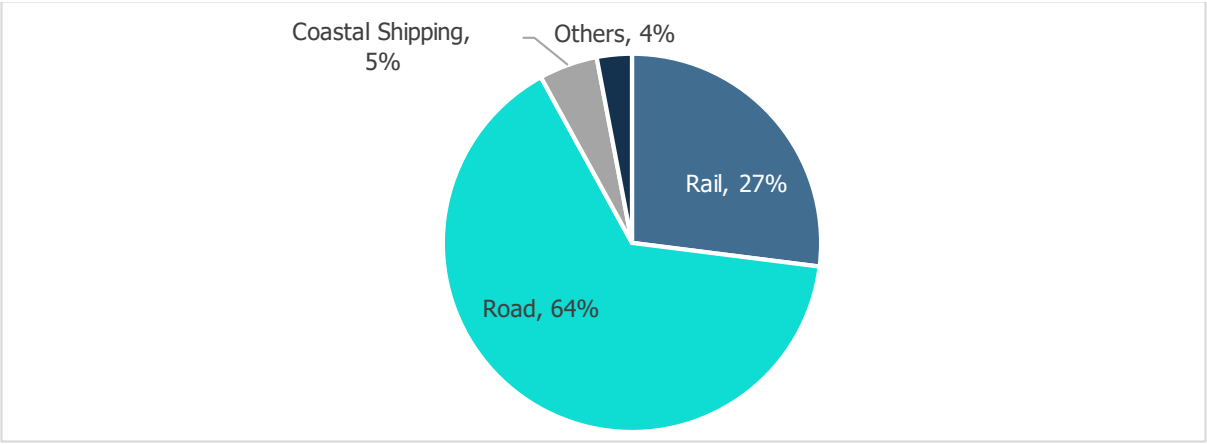
Source: Ministry of Railways, Report of the Committee on Mission 3000 million tonnes, Industry Sources

Moreover, the logistics industry connects other industries to the domestic and international markets. It affects the efficiency of the manufacturing global value chains and the competitiveness of a country's economy within these value chains.

Some of the reasons that can be attributed to the higher cost of logistics in India are:

- **The Inter-Modal Mix is Skewed toward Road Transport:** The capacity of the Indian railways is constrained and there are various challenges like rake availability and delays in rake placements. Accordingly, road transport is preferred compared to railways despite it being a cheaper alternative. Road transport currently has a share of about 64% in the freight movement in the country.

Chart 38: Inter-modal Mix for Freight Movement in India as of FY22



Source: National Railway Plan

- **Inefficient Transport Vehicles**: India has a fleet of small and inefficient trucks. The highest capacity of trucks in India is 16 tonne and 25 tonne. Whereas in countries like China, the trucks have 26-40T capacity.

- **Road Infrastructure Constraints:** Underdeveloped road infrastructure leads to inefficient movement of freight. Additionally, there is a lack of 4/6 lane roads, which further results in congestion across the key routes leading to an increase in costs.

The high cost of logistics thus adversely affects the global competitiveness of Indian steel products. Besides, the domestic steel plants are in remote areas, and hence, the companies are faced with severe logistics challenges.

- **Decarbonization and Environmental Concerns**

The Indian steel industry is responsible for roughly 12% of India's carbon dioxide (CO_2) emissions, surpassing the global average of 7-9%[6]. The emission intensity in the Indian steel industry stands at 2.55 T/TCS[7], while the global average emission intensity is 1.91 T/TCS.

India has made a commitment to decrease the emissions intensity of its Gross Domestic Product (GDP) by 45% by 2030, compared to 2005 levels and achieve net zero by 2070. To support this target, the Ministry of Steel has committed to achieving the Net Zero target by 2070 and has taken a medium-term target to reduce the emission intensity of the steel sector to 2.4 T/TCS by 2030.

These targets remain critical for the steel industry players including steel pipes and tube manufacturers for reducing the emissions within the set timelines. The reduction of emissions is also vital for the industry to maintain its competitiveness in export markets which are becoming increasingly environment conscious. Commencing in October 2023, the European Union (EU) has decided to implement a Carbon Border Adjustment Mechanism (CBAM) – a tariff on carbon-intensive imports, aimed at preventing carbon leakage. The first phase of CBAM will cover the iron & steel, cement, aluminium, fertilizer, electricity, and hydrogen sectors.

[6]https://worldsteel.org/publications/policy-papers/climate-change-policy-paper/#:~:text=In%202020%2C%20on%20average%2C%20every,between%207%25%20and%209%25.

[7] Tonne of CO2 equivalent per tonne of crude steel

3.11 Government Policies and Incentives for the Steel Industry

Since steel is one of the most crucial materials in infrastructure development, the government has taken multiple initiatives over the last decade to encourage steel production and consumption of domestically manufactured steel targeted towards making India *'Atmanirbhar'* for its present as well as future demand.

Some of these initiatives are listed below:

- **National Steel Policy, 2017**

National Steel Policy (NSP) was introduced in 2017 with the objective to increase domestic steel production and consumption, produce high-quality steel and increase in India's competitiveness globally. It also focuses on cost efficiency, raw material availability and research & development to achieve the overall objectives laid out under the policy. The mission defined under NSP, 2017 is as below:

- Self-sufficiency in steel production by providing policy support & guidance to private manufacturers, MSME steel producers, and CPSEs & encourage adequate capacity additions.
- Development of globally competitive steel manufacturing capabilities.
- Cost-efficient production and domestic availability of iron ore, coking coal, and natural gas.
- Facilitate investment in overseas asset acquisitions of raw materials.
- Enhance domestic steel demand.

Table 5: Target Set Under the NSP, 2017

Parameter	Projections (FY31)
Total crude steel capacity (in MTPA)	300
Total crude steel demand/production (in MTPA)	255
Total finished steel demand/production (in MTPA)	230
Sponge iron demand/production (in MTPA)	80
Pig iron demand/ production (in MTPA)	17
Per Capita Finished Steel Consumption (in kg)	160

Source: Ministry of Steel

The policy also aims to achieve the below objectives:

- Build a globally competitive industry.
- Increase per Capita Steel Consumption to 160 kg by FY31.
- To domestically meet the entire demand for high-grade automotive steel, electrical steel, special steels, and alloys for strategic applications by FY31.
- Increase domestic availability of washed coking coal to reduce import dependence on coking coal from ~85% to ~65% by FY31.
- To have a wider presence globally in value-added/high-grade steel.
- Encourage the industry to be a world leader in energy-efficient steel production in an environmentally sustainable manner.
- Establish domestic industry as a cost-effective and quality steel producer.
- Attain global standards in Industrial Safety and Health.
- To substantially reduce the carbon footprint of the steel industry.

• **Preference to Domestically Manufactured Iron & Steel Products in Govt Procurement**

The government introduced the Domestically Manufactured Iron & Steel Products (DMI & SP) Policy in May 2017 to provide preference to domestically produced iron and steel material in government tenders. Further, the Policy was revised on May 29, 2019, and on December 31, 2020. The salient features of the Policy are as follows:

- The policy covers a list of 49 manufactured products of iron and steel. The minimum domestic value addition of 20-50% is specified on these 49 products of iron and steel. The Policy also covers capital goods for manufacturing iron and steel products for which a minimum domestic value addition of 50% is specified.
- Each Ministry or Department of Government and all agencies/entities under their administrative control are under the purview of the DMI & SP policy as notified by the Ministry of Steel. All Central Sector Schemes (CS)/Centrally Sponsored Schemes (CSS) for which procurement is made by States and Local Bodies, come within the purview of this Policy, if that project/scheme is fully/partly funded by the government of India.
- The policy is applicable to projects where the procurement value of iron and steel products is greater than Rs. 5 lakh. The policy is also applicable for other procurements (non-project), where the annual procurement value of iron and steel products for that government organization is greater than Rs. 5 lakh. However, it shall be ensured by procuring entities that procurement is not split for the purpose of avoiding the provisions of this policy.
- The policy is applicable to the purchase of iron and steel products by private agencies for fulfilling an EPC contract and/or any other requirement of the Ministry or Department of Government or their PSUs and to capital goods for manufacturing iron and steel products in compliance with prescribed quality standards, as applicable.
- No Global Tender Enquiry (GTE) shall be invited for tenders related to the procurement of iron and steel products or capital goods for manufacturing iron and steel products having estimated value up to Rs. 200 crore except with the approval of competent authority as designated by the Department of Expenditure.
- The policy has provisions for waivers to all such procurements, where specific grades of steel are not manufactured in the country, or the quantities as per the demand of the project cannot be met through domestic sources.

The policy promotes the growth and development of the domestic steel Industry in government-funded projects. As of March 2023, the total value of steel procured under the DMI&SP policy since its implementation is Rs 34,808 crore[8].

Other Initiatives

• **Support to MSMEs of EEPC for the Promotion of Exports**

Domestic Integrated Steel Producers (ISPs) have decided to make available four main products utilized by engineering exporters, i.e. Hot Rolled Coil (HRC), Cold Rolled Coils (CRC), Wire Rods and Alloy Bars to MSME members of Engineering Export Promotion Council (EEPC) of India at the export parity price, in order to reduce their cost of input steel so that their export products are more competitive in the international market. To facilitate the supply of steel under this arrangement through dealers/service centres of these ISPs, DGFT has issued a notification extending the scheme of Duty Drawback on the supply of steel-by-steel manufacturers to the EEPC MSMEs through their Service Centres / Distributors / Dealers / Stock Yards vide Notification No. 35/2015-20 dated 01.10.2020.

• **Enhancing the scope of the Quality Control Orders on Steel**

Ministry of Steel gave major thrust to the Steel Quality Control Order (SQCO) from 2015 onward, thereby banning substandard/ defective steel products to ensure that only quality steel conforming to the relevant BIS standards is made available to the end users. Ministry of Steel has covered 99 carbon steel, 44 stainless steel & alloy steel and 2 ferro alloys under the mandatory BIS Certification scheme.

[8] https://pib.gov.in/PressReleseDetailm.aspx?PRID=1911159

The Ministry as a policy now covers raw material as well as goods and articles made of steel such as stainless-steel pipes and tubes, laminations/ cores of transformers, products of tin plate & tin free steel etc. in the notification to prevent circumvention of the SQCO. A dedicated portal has been developed to process the applications for seeking clarification/exemption as regards the applicability of SQCO on a particular grade of steel in a time-bound and transparent manner.

In addition, Indian Standard 11587 was revised by BIS and corten steel has been included to meet the requirements of container manufacturing. This step was taken to reduce import dependency for corten steel and make the container manufacturing industry Atmanirbhar.

- **Setting Up of PDC for Attracting Investments**

The Government of India has set up an Empowered Group of Secretaries (EGoS) and Project Development Cells (PDCs) in Ministries/Departments to attract investments and to handhold and further smoothen investment inflows. The Ministry of Steel PDC is working in tandem with other Ministries as well as State Departments to address the concerns of investors as well as facilitate investment in the steel sector of the country.

The government has brought specialty steel under the ambit of the Performance Linked Incentive Scheme (PLI), introduced the Steel Scrap Recycling Policy and has set out a roadmap for reducing carbon emissions from the steel industry and promoting green steel. These initiatives have been discussed in detail in the subsequent sections of this report.

- **Steel Scrap Recycling Policy**

Ministry of Steel issued the Steel Scrap Recycling Policy in November 2019 which provides a framework to facilitate and promote a circular economy in the steel sector and promote scrap-based steelmaking to improve cost competitiveness and reduce the emission of greenhouse gases from steel production. The policy has set the framework for establishing metal scrapping centres in India for the scientific processing and recycling of ferrous scrap generated from various sources and a variety of products. The Policy framework provides standard guidelines for collection, dismantling and shredding activities in an organized, safe, and environmentally sound manner. The Policy enumerates the responsibilities of the dismantling centre and scrap processing centre, the roles of aggregators and the responsibilities of the government, manufacturer and owner.

- **Production Linked Incentive (PLI) Scheme**

o To enhance the manufacturing capabilities and export market, the government launched the PLI scheme for specialty steel under the Ministry of Steel in July 2021 with a budgetary outlay of Rs. 6,322 crores.

o India is dependent on specialty steel as it is used in automobiles, defense, railways, space, power, and renewable energy. The usage of this steel goes into the manufacturing of tubes and pipes due to its properties such as heat resistance and corrosion resistance.

o The scheme covering specialty steel grades is applicable for the following product segments below:

i. Coated/Plated Steel Products
ii. High Strength/ Wear-resistant Steel
iii. Specialty Rails
iv. Alloy Steel Products and Steel wires
v. Electrical Steel

o PLI is expected to boost the production of the above products in domestic industry and reduce the dependency on imports. This will not only ensure import substitution of goods but also encourage a growth in the exports.

○ Through this scheme, the production of specialty steel grade is estimated to grow more than double by FY27 to 42.2 MT from 17.6 MT in FY20, an increase of 140%.
○ This incentive scheme is also expected to attract investments of about Rs.39,625 crore by FY30 in specialty steel.

Ensuring Raw Material Security for the Steel Industry

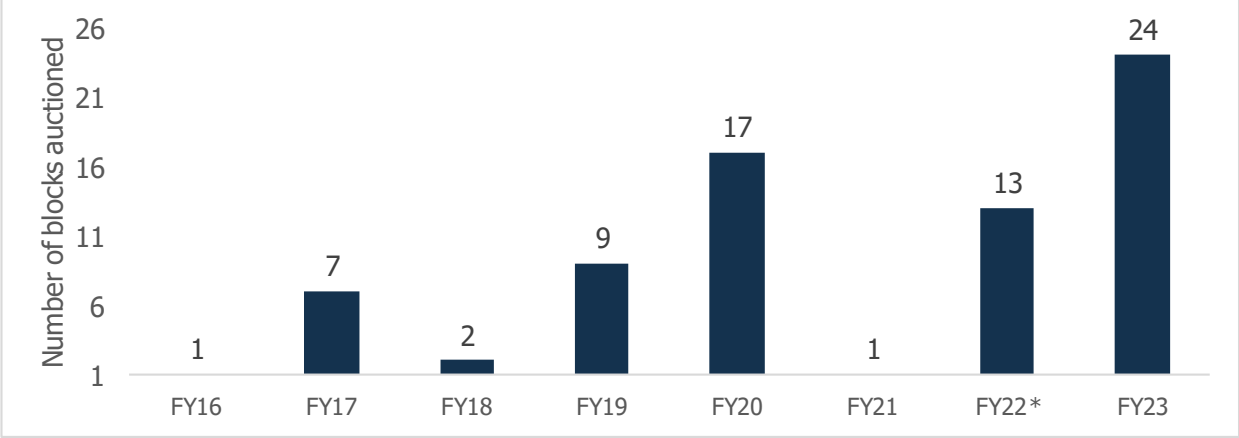
The raw material is a critical enabler for ensuring sustained growth in the iron & steel industry. As per NSP 2017, 437 MT of iron ore and 161 MT of coking coal will be required to achieve production of 255 MT of crude in FY31, compared to about 254 MT and 52 MT of iron ore and coking coal produced in FY22, respectively. The Ministry has been working closely with the Ministry of Mines and the Ministry of Coal on the following:

1. Iron Ore:

• **Expediting Iron Ore Mining Auction**

Mining and mineral Policy reforms have ensured enhanced production, expeditious auction & operationalization of expired mines, ease of doing business and the seamless transfer of all valid rights & approvals. The Ministry of Mines has auctioned a total of 73 iron ore mines from FY16-FY23 (up to December 21, 2023) across various states; of which 24 mines were auctioned in FY23. The Government proposes to ensure prompt identification, auction and operationalization of iron ore mines to ensure sufficient iron ore is available to meet the steel production targets under NSP.

Chart 39: Auctioned Iron Ore Blocks (FY16-FY23)



Source: Ministry of Mines

*Note: One Iron Ore Block auctioned in FY20 in Odisha was Forfeited. The same was re-auctioned in September 2021.

• In August 2022, the Supreme Court raised the iron ore production limit to 15 MT from 7 MT collectively from Chitradurga & Tumakuru districts of Karnataka whereas the limit has been increased to 35 MT from 28 MT for Bellary district.
• Mining operations for iron ore in Donimalai mines in Bellary district, Karnataka have been resumed on February 18, 2021. The operationalization of the Donimalai iron ore mines will increase the annual iron ore production in the country by 7 MTPA.
• Moreover, the Ministry of Steel has requested to Ministry of Mines to frame a policy for providing incentives to the beneficiation and direct industries to utilize low-grade fines for beneficiation and palletisation. This move will contribute towards zero waste mining in the country. The Ministry of Mines has also constituted a Committee in the Indian Bureau of Mines to examine the issue regarding the "Utilization of low and lean-grade iron ore resources in the country".

2. Coking Coal:

• Mission Coking Coal

○ The Ministry of Coal set up 'Mission Coking Coal' to develop a road map for increasing production and utilization of domestic coking coal in India by 2030. The government has taken the following initiatives under 'Atmanirbhar Bharat' to increase the production of coking coal in India to 140 MT by 2030[9].

○ Coal India Limited's raw coking coal production from existing mines is to be increased to up to 26 MT and 10 new mines have been identified which will achieve PRC (maximum production capacity) of about 22 MT by FY25.

○ CIL has offered eight discontinued coking coal mines on revenue sharing model to the private sector with a PRC of 2 MT.

○ CIL is setting up nine new coking coal washeries and also revamping the existing coking coal washeries to augment washing capacity.

○ Ministry of Coal has auctioned 10 coking coal blocks to the private sector with a PRC of 22.5 MT during the last two years. Most of these blocks are expected to start production by CY25. Another 4 to 6 blocks are being identified for the next auction.

○ The government has also been proactively changing the duties on imported coking coal to increase the present blending of 10-12% of domestic coking coal with imported coking coal to 30% by FY2030 and reduce the import of coking coal. Between May 2022 – November 2022, imports of anthracite and coking coal did not attract any import duty. With effect from November 19, 2022, imports of anthracite and coking coal, along with other types of coal, will attract customs duty at the rate of 2.5%.

• Diversification of Imports

As there was a large dependence on Australia, the Government has been focusing on diversifying the sources of coking coal to ensure seamless supply and also optimize the cost of imports. In October 2021, a Memorandum of Understanding (MoU) was signed between the Ministry of Steel and the Ministry of Energy, Russian Federation for cooperation in the field of coking coal. This step will benefit the Indian steel industry by diversifying the sources of coking coal and is also expected to lead to input cost reduction for the steel players due to the long-term commitment to supply high-quality coking coal to India (up to 40 MT till 2035). This MoU also envisages the implementation of joint projects/commercial activities in the coking coal sector, including the development of coking coal deposits and logistics development, sharing of experience in coking coal production management, technologies of mining, beneficiation, processing as well as training. In addition, the MoU envisages promoting research collaboration between the two countries.

3.12 Key Industry Trends

3.12.1. Decarbonising the Steel Industry

In India, about 46% of the steel is produced through the BF-BOF route and the balance 54% is produced through the electric route - EAF and induction furnace. While the BF-BOF process requires a higher quantity of coking coal, even the EAF/EIF-based producers have been consuming large quantities of Direct Reduced Iron (DRI) due to limited availability of steel scrap, which has resulted in higher coal consumption and CO_2 emission intensity.

The Ministry of Steel has made a commitment to achieve the Net Zero target by 2070 and has taken a medium-term target to reduce the emission intensity of the steel sector to 2.4 T/TCS by 2030.

[9] https://pib.gov.in/PressReleasePage.aspx?PRID=1883342

Various measures as listed below, have been taken towards this target.

- Steel Scrap Recycling Policy, 2019 has been introduced to enhance the availability of domestically generated scrap to reduce the consumption of coal in steel making.

- The steel sector has also been made a stakeholder in the National Green Hydrogen Mission for green hydrogen production and usage as announced by the Ministry of New and Renewable Energy (MNRE).

- Motor Vehicles (Registration and Functions of Vehicles Scrapping Facility) Rules September 2021, shall increase the availability of scrap in the steel sector.

- The National Solar Mission launched by MNRE in January 2010 promotes the use of solar energy and also helps reduce the steel industry emissions.

- The Perform, Achieve and Trade (PAT) scheme, under the National Mission for Enhanced Energy Efficiency, incentivizes the steel industry to reduce energy consumption.

- The steel sector has adopted the Best Available Technologies (BAT) available globally, in the modernization and expansion projects.

- Japan's New Energy and Industrial Technology Development Organization (NEDO) model projects for energy efficiency improvement have been implemented in steel plants.

Since the average age of a majority of the large plants is low, it is not cost-effective for the industry to immediately move to more climate-friendly technologies. Accordingly, the steel industry is exploring multiple avenues to reduce CO_2 emissions from the existing manufacturing processes.

Further, research and development is being undertaken globally on the following technologies:

▪ **Green Steel**

Green steel refers to the production of steel without the use of fossil fuels such as coal. Green hydrogen is one of the viable elements that can be used instead of coal as a reducing agent in green steel production through the BF-BOF route. Whereas in the EAF route, green steel can be produced using steel scrap and renewable energy or by using DRI produced using renewable energy.

The concept of green steel is at a nascent stage in India with some of the large players having set up pilot plants to determine commercial viability. For instance, Kalyani Group, under its subsidiary Saarloha Advanced Materials, launched India's first green steel in December 2022, which is being produced at its electric arc furnace located at its plant in Pune using renewable energy. In April 2023, Tata Steel initiated trials of injecting large quantities of hydrogen gas in the blast furnace located at its Jamshedpur plant to assess the viability of hydrogen in the production process and its impact on the reduction of carbon emissions.

Currently, India does not have a significant production capacity of green hydrogen. The National Green Hydrogen Mission was approved by the Union Cabinet in January 2023 with an objective of developing a green hydrogen development capacity of 5 MT by 2030 at an estimated capital expenditure of Rs 8 lakh crore. Further, the price of green hydrogen, currently around Rs 300 per kg, is proposed to be brought down to USD 1-2 per kg (Rs 80-160 per kg) to make it commercially viable for various end-user industries.

Some of the key factors that will encourage domestic steel players to invest in the large-scale production of green steel are the development of cost-effective scalable technology, the ramp-up in renewable energy capacity and production, the availability of the requisite quantity of green hydrogen at viable prices, and the availability of iron ore of suitable grade.

▪ **Carbon Capture Utilisation and Storage (CCUS)**

Carbon Capture Utilisation and Storage (CCUS) involves capturing carbon dioxide at emission sources and then using them for making items such as building materials, or permanently storing them at underground locations. The technology helps in capturing the carbon dioxide before it can enter the atmosphere, and therefore, helps reduce emissions.

As per Niti Aayog[10], CCUS can enable the scalable and profitable conversion of waste gases from BF, coke oven and BOF of integrated steel plants to blue hydrogen (produced from methane or coal and through carbon capture) at a cash cost of less than Rs. 100 per kg. Blue hydrogen can be used within the steel plant as a source of clean energy or for producing clean DRI. Blue hydrogen can also be sold to external consumers, thereby propelling the clean hydrogen economy in India.

Furthermore, CCUS can enable a wide variety of opportunities to convert the captured CO_2 to different value-added products like food and beverage applications, building materials, chemicals, polymers, and enhanced oil recovery. This offers wide market opportunities in India, thus substantially contributing to a circular economy.

Moreover, in order to facilitate the development of CCUS technology, the government has launched various initiatives under the Department of Science and Technology. Further, some of the large players have set up pilot facilities to assess the viability of the mechanism. For instance, in September 2021, Tata Steel commissioned a pilot 5-tonne-per-day carbon capture plant at its Jamshedpur steel plant. In addition, Jindal Steel Works (JSW) has implemented a carbon capture and storage facility with 100 tonnes per day capacity at its DRI plant at Dolvi. The captured carbon is to be utilized in the food and beverages industry.

3.12.2. Enhancing Sustainability and ESG Focus

In recent years, the steel industry has undergone a significant transformation in its approach to Environmental, Social, and Governance (ESG) practices, focusing on addressing environmental concerns. Steel manufacturers are increasingly prioritizing the reduction of carbon emissions and energy consumption. They are implementing a range of strategies to achieve this, including improving energy efficiency, optimizing waste and water management, and integrating renewable energy sources into their operations. Additionally, technological advancements, such as hydrogen-based direct reduction processes and carbon capture utilization and storage (CCUS) techniques, are expected to play a pivotal role in further decreasing the carbon footprint associated with steel production.

Further, the steel industry is a significant contributor to greenhouse gas (GHG) emissions. The primary source of GHG emissions in steel production is the use of carbon-intensive fuels, such as coal and coke, in the iron-making and steel-making processes. These processes release carbon dioxide (CO2) as a by-product. The industry has been working toward reducing its GHG emissions through various strategies. One of the approaches is to curb this by adopting advanced technologies and processes, such as using energy-efficient furnaces and optimizing production methods. Additionally, the use of alternative fuels and raw materials, such as natural gas and renewable energy sources, can help lower carbon emissions.

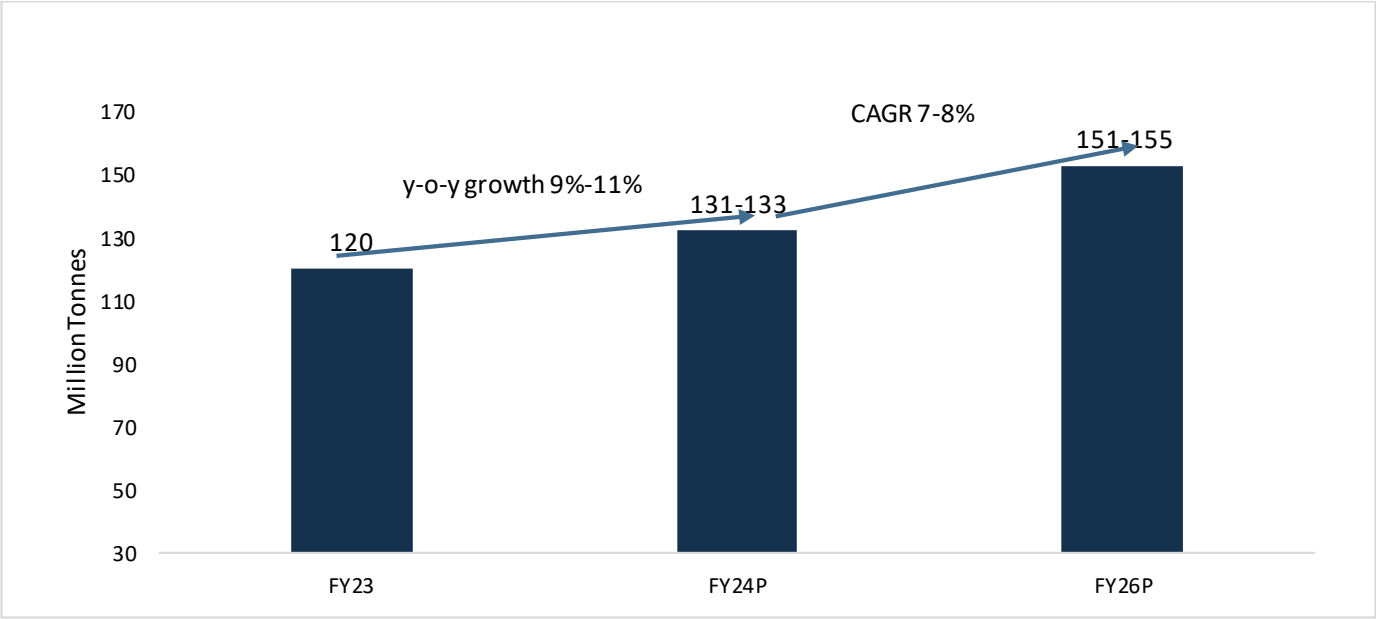
[10] Carbon Capture, Utilization and Storage (CCUS) - Policy Framework and its Deployment Mechanism in India, November 2022

The steel industry in India is making significant strides toward integrating ESG principles into its operations. The industry recognizes the importance of sustainability and is actively working toward reducing its environmental impact, promoting social welfare, and enhancing corporate governance practices.

3.13 Outlook of Indian Finished Steel Consumption

The demand for steel is driven by sectors like construction, real estate, railways, roads, capital goods, and consumer durables, among others. In addition, government expenditure on infrastructure is expected to augur well for the sector. The thrust toward infrastructure projects is majorly contributing to the rise in steel demand in the domestic market.

Chart 40: Total Finished Steel Consumption (FY23-FY26P)



Source: JPC, CareEdge Research Forecasts

CareEdge Research estimates India's steel consumption to see healthy growth of 9-11% y-o-y in FY24. By FY26, the steel consumption is expected to reach between 151-155 MT, indicating a CAGR of 7-8% between FY24 and FY26. The ramp-up in construction sector activities and sustained momentum in the real estate and automobile sectors are expected to boost the demand for steel products.

Further, as India has entered its pre-election year in 2023, the government is likely to increase investments both at the state and central levels, which is expected to augur well for the domestic steel demand.

Some of the key budgetary announcements which reflect the same are:

- An increase in allocation of CapEx towards infrastructure from Rs. 7.5 lakh crore to Rs. 14.91 lakh crore in Union Budget 2023-24.
- The capital outlay of Rs. 2.93 lakh crore for Indian Railways.
- 100 transport infrastructure projects.
- Approval of Production Linked Incentive (PLI) Scheme for specialty steel.
- Allocation toward the PMAY scheme to be increased to Rs. 79,590 crore from Rs. 77,130 crore in the previous budget.
- Aggregate allocation of Rs 70,000 crore toward the Jal Jeevan Mission in Union Budget 2023-24.

3.14 Advantages of Backward and Forward Integration (in terms of having a Pellet Plant, Captive Power/Railway Siding/By-Products)

Backward integrated operations enable steel producers to reduce raw material costs, have better control of the supply chain, and ensure raw material availability.

Captive Iron Ore and Coal Mines: Iron ore and coking coal are critical raw materials for steel manufacturing – for producing 1 tonne of steel, 1.6-1.7 tonne of iron ore and 0.6 tonne of coking coal are required. Thus, having captive iron ore and coking coal mines enables the players to reduce costs since raw materials can be sourced at lower costs compared to sourcing from commercial sellers. It also protects companies against the impact of significant volatility in raw material prices. Moreover, there is certainty of raw material availability as per the production requirements

Pellet Plant: Through pelletisation, steel manufacturers can utilize iron ore fines available in higher quantities compared to lumps. The pellets can then be directly utilized in blast furnaces. Pelletisation also reduces transportation costs and handling losses. Moreover, pellets have better permeability due to size uniformity and lead to higher plant productivity.

Captive Power Plant: Steel producers can benefit from having their own power plant, which can significantly reduce their energy costs. Additionally, operating a captive power plant will decrease steel producers' exposure to disruptions to the electricity grid in times of power outages that can otherwise lead to costly production disruptions. Further, steel companies can use captive power plants to generate electricity from cleaner and more efficient sources such as waste-heat recovery-based power plants and captive renewable energy plants.

Railway Siding: For the production of 1 million tonnes of steel, about 3 million tonnes of raw material need to be moved. Given the significant amount of material movement, having a railway siding allows steel producers to restrict losses during material handling and transportation. It also improves the efficiency of steel producers' transport operations by loading and unloading material/steel products directly onto railway wagons. Furthermore, this reduces the time and cost of transporting raw materials and steel products while minimizing producers' reliance on third-party transportation providers.

Moreover, multiple players in the steel industry have also forward integrated steel product manufacturing, including both long and flat products. These are value-added products and enhance the manufacturer's profitability.

3.15 Key Success and Risk Factors of Operating in Steel Space

Key Success Factors:

a) Backward and Forward Integration

As discussed in earlier sections, there are significant benefits of backward and forward integration, including improvement in operational efficiency and better profitability, among others. Hence, it becomes one of the key success factors in the industry.

b) Geographical and End-User Market Diversification

It is beneficial for steel producers to have geographically spread manufacturing facilities, which gives them a broader market reach to sell their products to a wide range of customers. This is because steel products (especially longs) are only procured by areas located in the vicinity of the plant due to their bulky nature. By diversifying exports to emerging markets using a well-developed local distribution network, steel manufacturers can explore new growth opportunities, reduce concentration, and mitigate risks.

c) Focus on Sustainability

Given the increasing global focus on emission reductions, it is critical for steel manufacturers to focus on emission reduction and adoption of sustainable practices as both Indian and global governments are placing significant emphasis on the reduction of greenhouse gases, including the import of products with low carbon footprints.

Key Risks:

a) Raw Material Price Risk

The steel sector is heavily reliant on raw materials such as iron ore and coal. Although India has abundant reserves of iron ore and coal, it has limited reserves of coking coal. The country largely fulfils its coking coal requirements through imports from various countries such as Australia, Indonesia, and South Africa. Moreover, the prices of raw materials are subject to global market trends, geopolitical events, and supply-demand imbalances. Any fluctuation in prices of the raw materials can significantly impact the cost of production of the steel producers.

b) Infrastructure Constraints

As most of India's steel plants are located inland, managing logistics requirements to physically transport the raw material to the steel plants and transporting finished products to client locations or ports for exports is quite challenging.

c) Cyclicality

The steel industry is cyclical in nature. During periods of high economic growth, steel demand tends to be strong, as businesses and consumers invest in new infrastructure and construction projects. However, during periods of economic downturn, steel demand is impacted, as businesses refrain from investing while consumers delay major purchases. Therefore, it is challenging for steel companies to maintain consistent profitability and business growth, especially during periods of economic downturn.

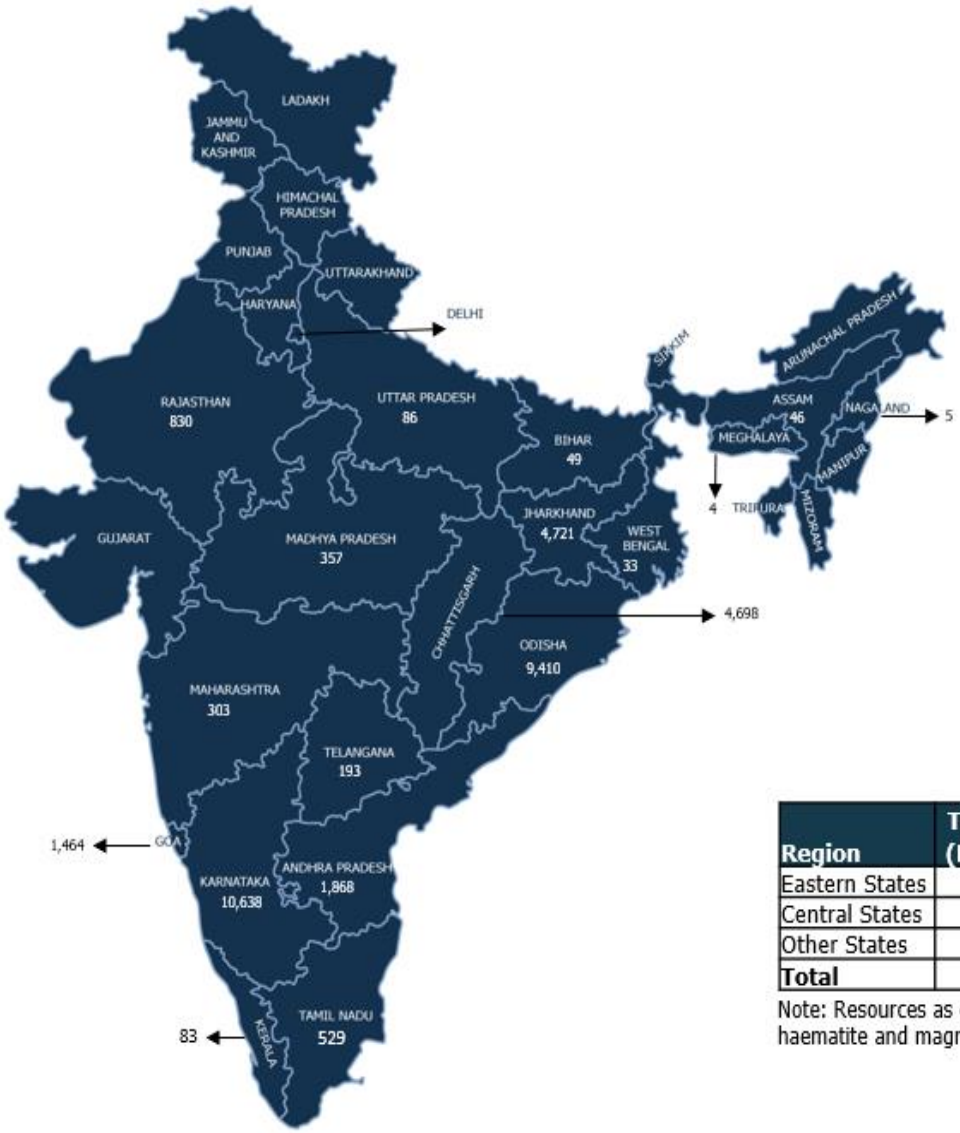
4 Geographic Importance of Resource Rich Region of Eastern & Central India

4.1 Iron Ore

India is a major global producer of iron ore, possessing around 6,411.9 million tonnes of reserves and 35,285.5 million tonnes of total resources of iron ore [magnetite (Fe_3O_4) and Haematite (Fe_2O_3)] as of April 2020.

The Eastern States account for 40.3% while the Central States account for 14.3% of the domestic iron ore resources.

Chart 41: State-Wise Total Resources of Iron Ore (As on April 2020)



Region	Total Resources (Million Tonnes)	% share
Eastern States	14,235	40.3%
Central States	5,055	14.3%
Other States	15,995	45.3%
Total	**35,286**	**100%**

Note: Resources as on 01.04.2020 (P) and include haematite and magnetite grades

Source: Indian Minerals Yearbook 2021 (Part III), 60th Edition, Iron Ore (Advance Release), dated May 2023
Note:
1. Eastern States: Assam, Bihar, Jharkhand, Meghalaya, Nagaland & Odisha
2. Central State: Madhya Pradesh & Chhattisgarh

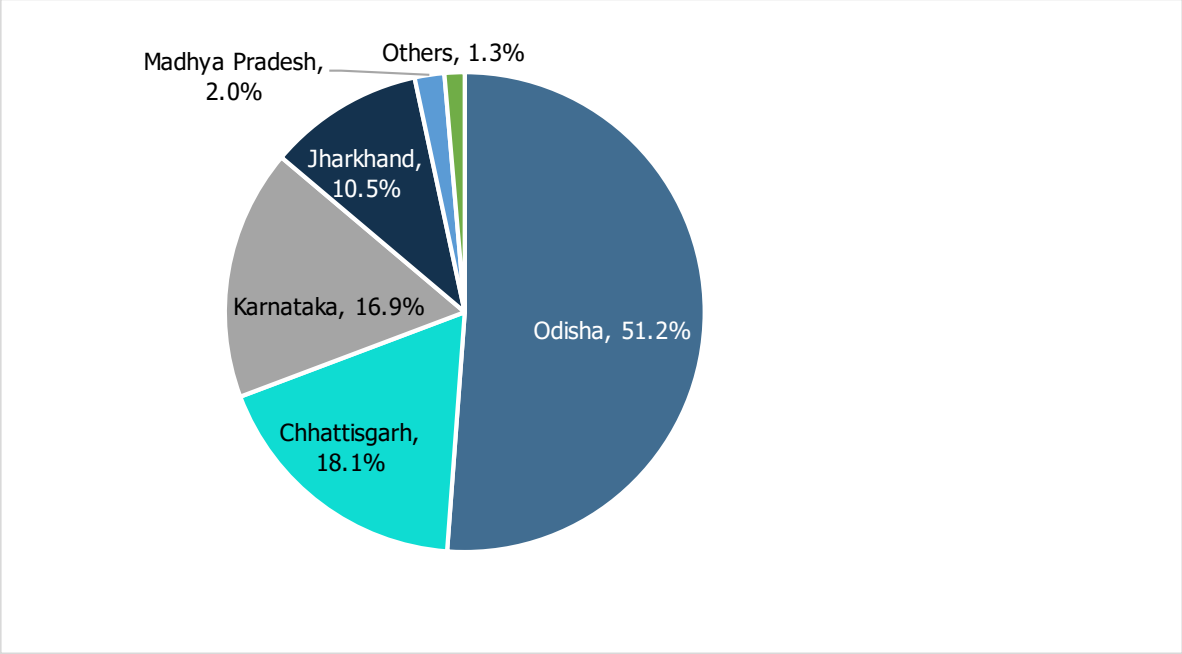
Table 6: State-Wise Break-up of Iron Ore Reserves and Resources (in Million Tonnes) as of April 2020

State	Reserves	Remaining Resources	Total Resources
A. Eastern States			
Assam	-	46	46
Bihar	-	49	49
Jharkhand	535	4,186	4,721
Meghalaya	-	4	4
Nagaland	-	5	5
Odisha	2,799	6,611	9,410
Sub-total	**3,333**	**10,902**	**14,235**
B. Central States			
Chhattisgarh	1,670	3,028	4,698
Madhya Pradesh	54	303	357
Sub-total	**1,724**	**3,331**	**5,055**
C. Other States			
Andhra Pradesh	45	1,823	1,868
Goa	122	1,342	1,464
Karnataka	1,044	9,595	10,638
Kerala	-	83	83
Maharashtra	16	288	303
Rajasthan	128	702	830
Tamil Nadu	-	529	529
Telangana	-	193	193
Uttar Pradesh	-	86	86
Sub-total	**1,355**	**14,641**	**15,995**
Total	**6,412**	**28,874**	**35,286**

Source: Indian Minerals Yearbook 2021 (Part III), 60th Edition, Iron Ore (Advance Release), dated May 2023

There were 273 reporting mines in FY21, up from 271 the previous year. In FY21, 204.48 MT of iron ore comprising lumps, fines, and concentrates was produced, a decline of 16.2% y-o-y. Odisha accounted for the highest share (51.2%) in the domestic iron ore production in FY21, followed by Chhattisgarh and Karnataka.

Chart 42: Share of States in Iron Ore Production (FY21)



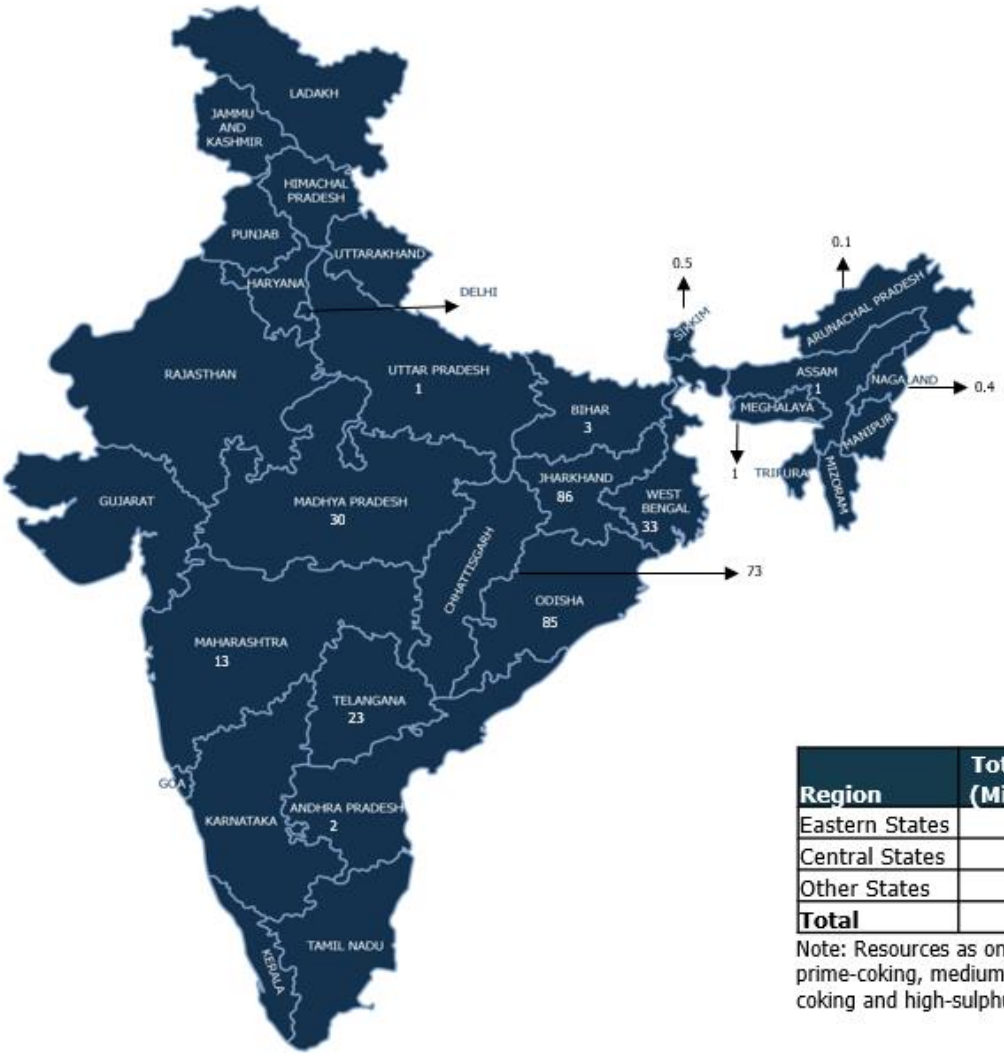
Source: Indian Bureau of Mines

4.2 Coal

India has coal reserves of 177 million tonnes and total resources of around 352 million tonnes as of April 2021, including prime-coking, medium-coking, blendable/semi-coking, and non-coking/high sulphur grades.

The Eastern States account for 60% while the Central States account for 29% of the domestic total resources of coal.

Chart 43: State-Wise Total Resources of Coal (as on April 2021)



Region	Total Resources (Million Tonnes)	% share
Eastern States	210	59.5%
Central States	104	29.4%
Other States	39	11.1%
Total	**352**	**100%**

Note: Resources as on 01.04.2021 and include prime-coking, medium coking, blendable/semi-coking and high-sulphur/non-coking coal

Source: Indian Minerals Yearbook 2021 (Part III), 60th Edition, Coal and Lignite (Advance Release), March 2023
Note:

1. Eastern States: Arunachal Pradesh, Assam, Bihar, Jharkhand, Meghalaya, Nagaland, Odisha, Sikkim & West Bengal
2. Central State: Madhya Pradesh & Chhattisgarh

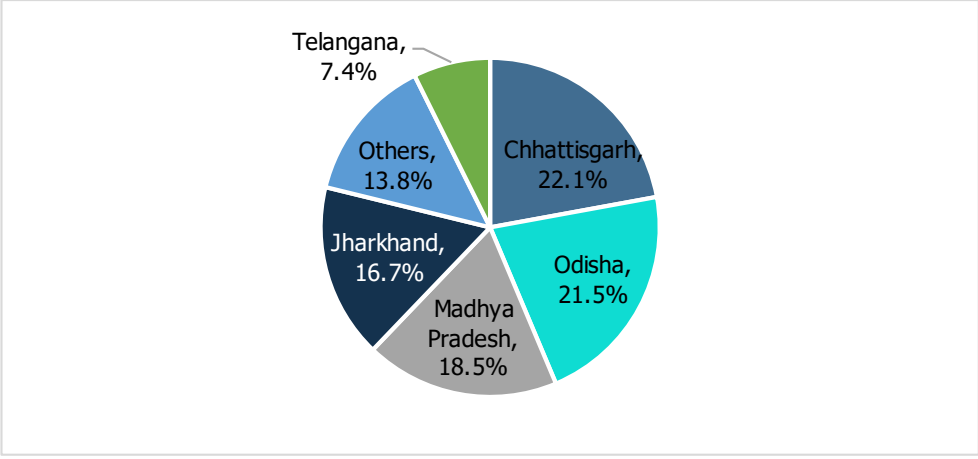
Table 7: State-Wise Break-up of Coal Reserves and Resources (in Million Tonnes) as of April 2021

State	Reserves	Remaining Resources	Total Resources
A. Eastern States			
Arunachal Pradesh	0.0	0.1	0.1
Assam	0.5	0.1	1
Bihar	0.3	3	3
Jharkhand	52	34	86
Meghalaya	0.1	0.5	1
Nagaland	0.0	0.4	0.4
Odisha	43	42	85
Sikkim	-	0.5	0.5
West Bengal	15	18	33
Sub-total	**111**	**98**	**210**
B. Central States			
Chhattisgarh	31	42	73
Madhya Pradesh	13	17	30
Sub-total	**45**	**59**	**104**
C. Other States			
Andhra Pradesh	1	1	2
Maharashtra	8	5	13
Telangana	11	12	23
Uttar Pradesh	1	0.2	1
Sub-total	**21**	**18**	**39**
Total	**177**	**175**	**352**

Source: Indian Minerals Yearbook 2021 (Part III), 60th Edition, Coal and Lignite (Advance Release), March 2023

As of March 31, 2021, 442 coal mines in India reported coal production. In FY21, the total reported (provisional) production of coal was 716.1 MT, a 2% decline y-o-y. Chhattisgarh accounted for the highest share (22.1%) in domestic coal production in FY21, followed by Odisha and Madhya Pradesh.

Chart 44: Share of States in Coal Production (FY21)



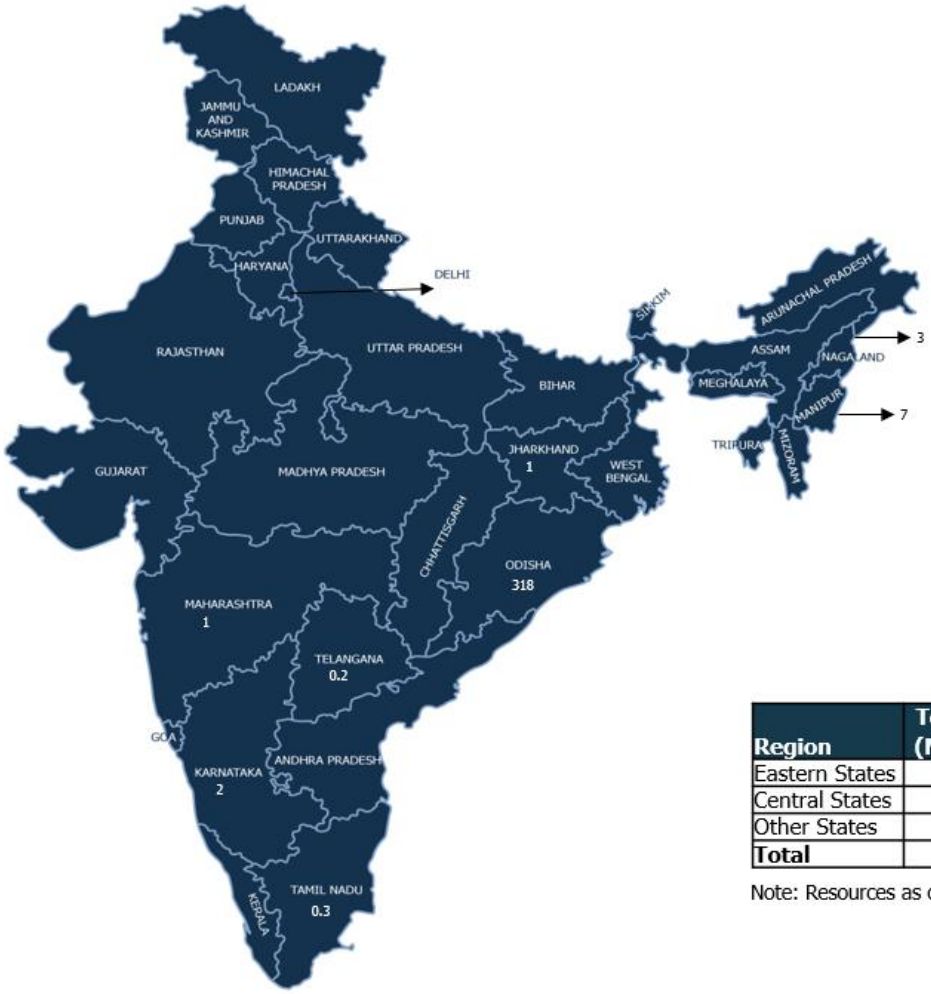
Source: Indian Bureau of Mines

4.3 Chromite

$FeCr_2O_4$, often known as iron chromium oxide, is the chemical name for chromium (Cr) and the only metal resource that is economically feasible. The characteristics of chromium that make it the most useful and adaptable are its improved hardenability and resistance to oxidation, corrosion, wear, and galling.

As of April 2020, the country's projected chromite reserves were 79 million tonnes and total resources were 332 million tonnes, 99% of which are located in Eastern States.

Chart 45: State-Wise Resources of Chromite



Region	Total Resources (Million Tonnes)	% share
Eastern States	329	99.1%
Central States	-	0.0%
Other States	3	0.9%
Total	**332**	**100%**

Note: Resources as on 01.04.2020P

Source: Indian Minerals Yearbook 2021 (Part III), 60th Edition, Chromite (Advance Release), April 2023

Note:

1. Eastern States: Jharkhand, Manipur, Nagaland and Odisha
2. Central State: NIL

Table 8: State-Wise Break-up of Chromite Reserves and Resources (in Million Tonnes) as of April 2020

State	Reserves	Remaining Resources	Total Resources
A. Eastern States			
Jharkhand	-	1	1
Manipur	-	7	7
Nagaland	-	3	3
Odisha	78	240	318
Sub-total	**78**	**251**	**329**
B. Other States			
Karnataka	0.5	1	2
Maharashtra	0.0	1	1
Tamil Nadu	-	0.3	0.3
Telangana	-	0.2	0.2
Sub-total	**1**	**2**	**3**
TOTAL	**79**	**253**	**332**

Source: Indian Minerals Yearbook 2021 (Part III), 60th Edition, Chromite (Advance Release), April 2023

There were 23 reporting mines of chromite in FY21 compared to 22 in FY20. Also, in FY21, 2.8 million tonnes of chromite were produced, a 27% reduction y-o-y.

Table 9: Production of Chromite in FY21(P)

State	No. of Mines	Quantity (Million tonnes)
Odisha	21	2.8
Karnataka	2	-
India	**23**	**2.8**

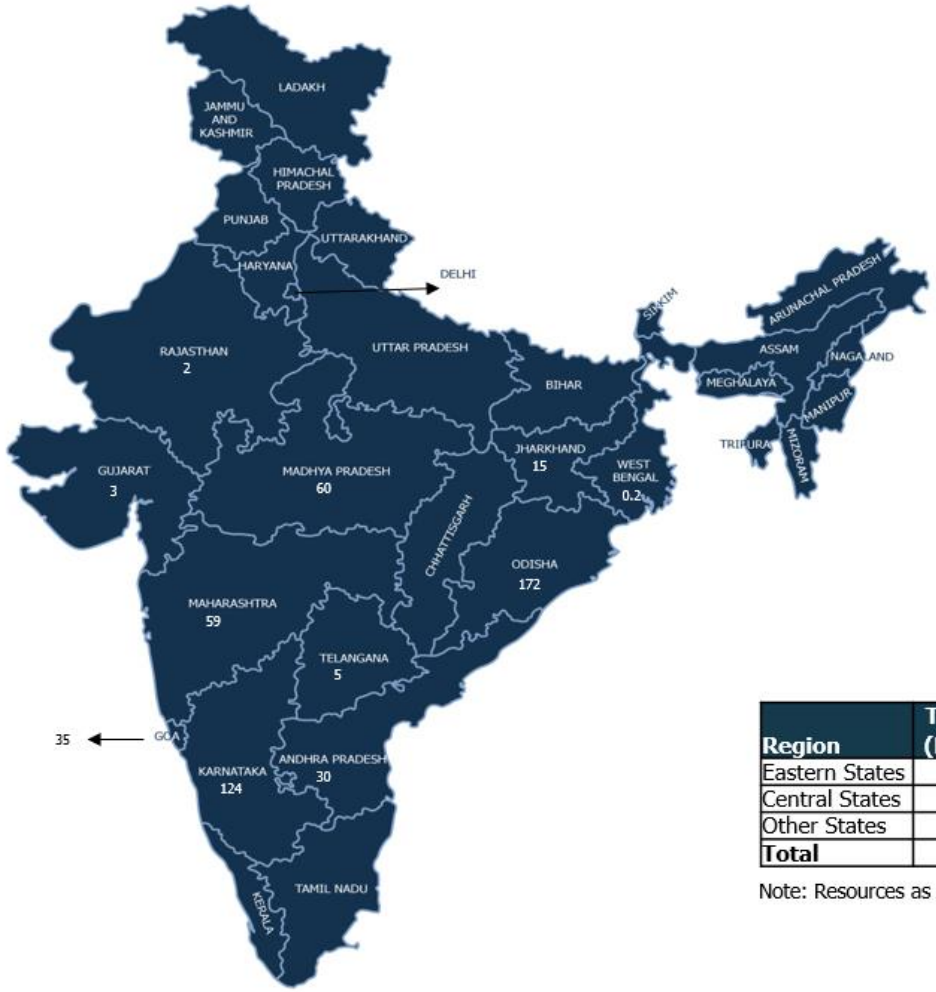
Source: Indian Bureau of Mines

4.4 Manganese Ore

Manganese ore resources in India are primarily metamorphosed bedded sedimentary deposits associated with the Gondite Series (Archaeans) of Madhya Pradesh (Balaghat, Chhindwara & Jhabua districts), Maharashtra (Bhandara & Nagpur districts), Gujarat (Panchmahal district), Odisha (Sundargarh district), and Kodurite Series (Archaeans) of Andhra Pradesh (Srikakulam & Visakhapatnam districts). Manganese in alloy form is a vital ingredient in steel production. It is also utilized in the production of disinfectants, plastics, paints, and electric batteries.

Further, the country's reserves and total resources of manganese ore as of April 2020 were estimated to be 75 million tonnes and 504 million tonnes, respectively. The Eastern States account for 37% while the Central States account for 12% of the domestic manganese ore resources.

Chart 46: State-Wise Resources of Manganese Ore as on April 2020



Region	Total Resources (Million Tonnes)	% share
Eastern States	186	37.0%
Central States	60	12.9%
Other States	257	51.0%
Total	**504**	**100%**

Note: Resources as on 01.04.2020P

Source: Indian Minerals Yearbook 2021 (Part III), 60th Edition, Manganese Ore (Advance Release), January 2023
Note:
1. Eastern States: Jharkhand, Odisha and West Bengal
2. Central State: Madhya Pradesh

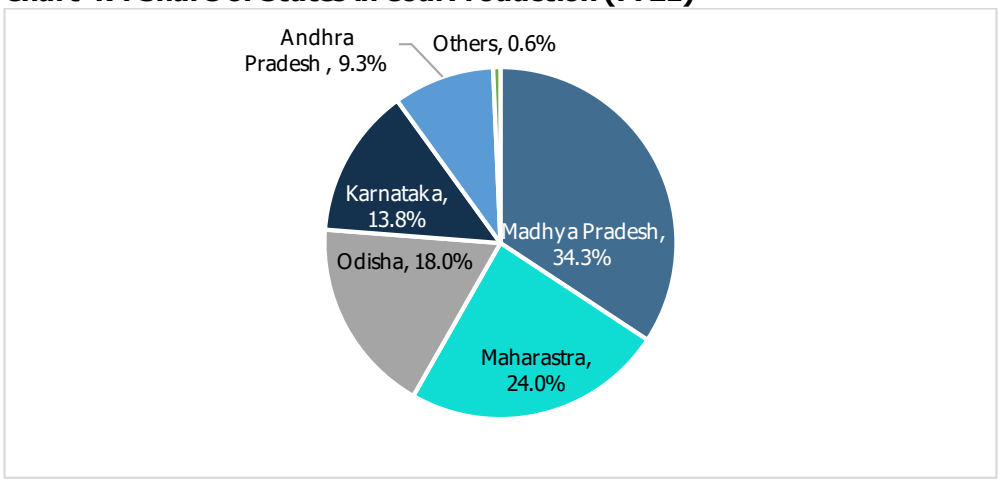
Table 10: State-Wise Break-up of Manganese Ore Reserves and Resources (in Million Tonnes) as of April, 2020 (P)

State	Reserves	Remaining Resources	Total Resources
A. Eastern States			
Jharkhand	1	14	15
Odisha	11	160	172
West Bengal	-	0.2	0.2
Sub-total	**13**	**174**	**186**
B. Central States			
Madhya Pradesh	20	40	60
Sub-total	**20**	**40**	**60**
C. Other States			
Andhra Pradesh	8	22	30
Goa	0.1	34	35
Gujarat	1	2	3
Karnataka	15	109	124
Maharashtra	18	41	59
Rajasthan	1	2	2
Telangana	0.3	4	5
Sub-total	**43**	**214**	**257**
TOTAL	**75**	**429**	**504**

Source: Indian Minerals Yearbook 2021 (Part III), 60th Edition, Manganese Ore (Advance Release), January 2023

In FY21, there were 135 reporting mines, compared to 137 in FY20. During this period, the total amount of manganese ore produced was 2.7 million tonnes. Madhya Pradesh accounted for the highest 34.3% share in production, followed by Maharashtra and Odisha.

Chart 47: Share of States in Coal Production (FY21)



Source: Indian Bureau of Mines

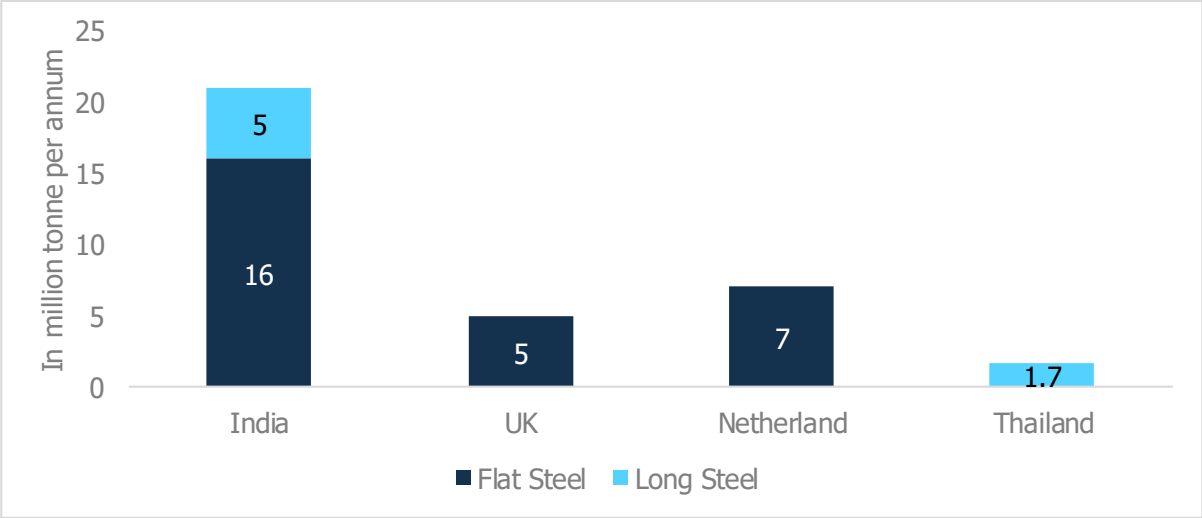
5 Peer Comparison

5.1 Profile of Key Industry Players

5.1.1 Tata Steel Limited

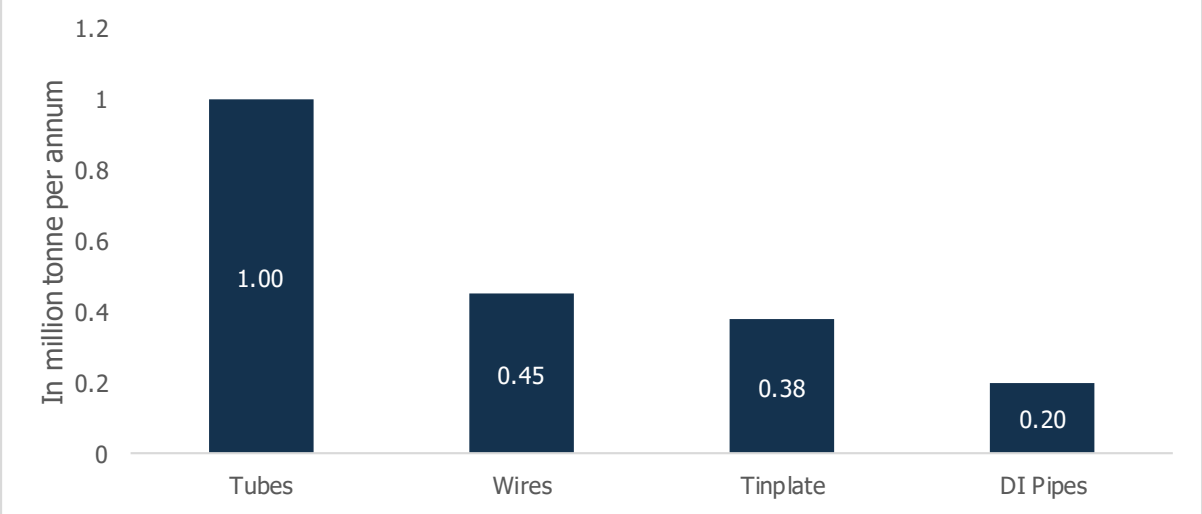
Tata Steel Limited, a Tata Group company, is a geographically diversified and integrated manufacturer of steel and steel products with an annual crude steel capacity of 35 MTPA as of March 31, 2023. The company's operations are spread across India, the UK, the Netherlands, and Thailand. The company currently has six operational iron ore mines in India and also owns iron ore assets in Canada. Moreover, it has coal mines in Jharia and West Bokaro in Jharkhand and 3 chromite mines (under Tata Steel Mining Limited).

Chart 48: Tata Steel: Crude Steel Capacity Break-up as on March 31, 2023



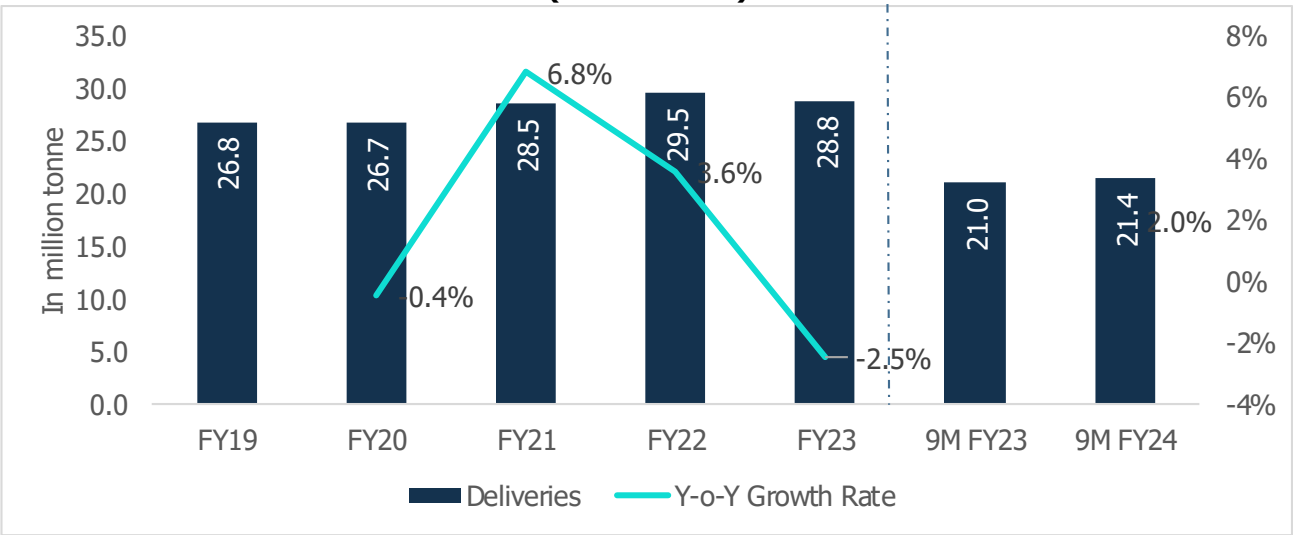
Source: Company Reports, CareEdge Research

Chart 49: Tata Steel: Downstream Capacity Break-up as on March 31, 2023



Source: Company Reports, CareEdge Research

Chart 50: Tata Steel: Trend in Deliveries (Consolidated)



Source: Company Reports, CareEdge Research

Table 11: Tata Steel – Consolidated Financials (in Rs. crore)

	FY19	FY20	FY21	FY22	FY23	9M FY23	9M FY24
Revenue	1,57,669	1,48,972	1,56,477	2,43,959	2,43,353	1,80,391	1,70,483
EBITDA	29,770	15,096	30,892	63,830	32,698	25,505	8,391
EBITDA Margin	18.90%	12.20%	19.80%	26.20%	13.40%	14.14%	4.92%
PAT	9,098	1,172	8,190	41,749	8,075	6,509	-5,464
PAT Margin	5.77%	0.79%	5.23%	17.11%	3.32%	3.61%	-3.21%

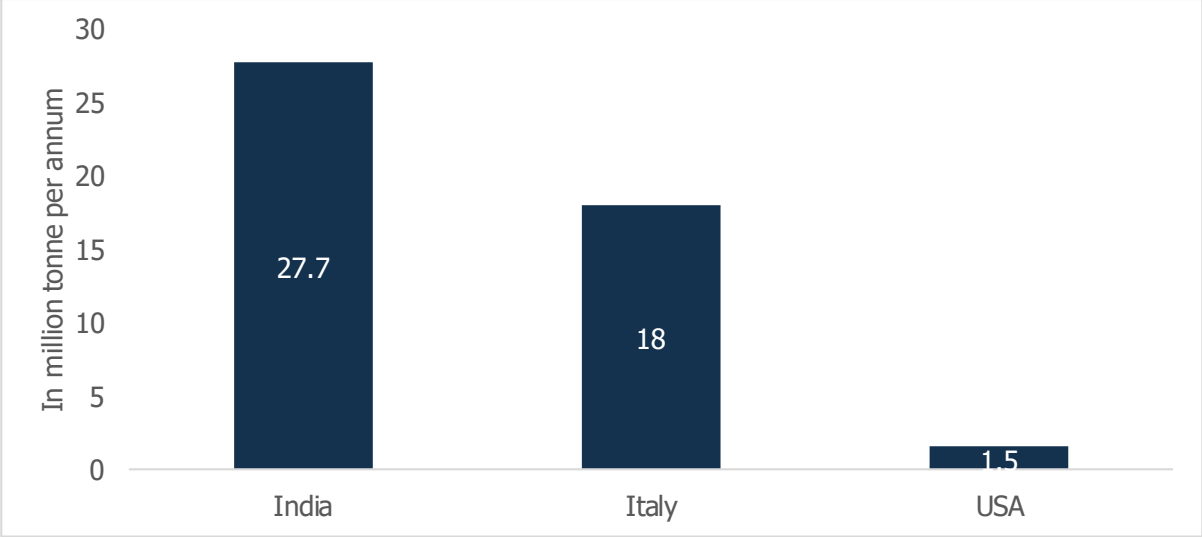
Source: Company Reports, CareEdge Research

Note: FY20 and FY21 incl. Southeast Asia Operations which is reclassified as continuing operations;
N.M: Not Meaningful

5.1.2 JSW Steel Limited

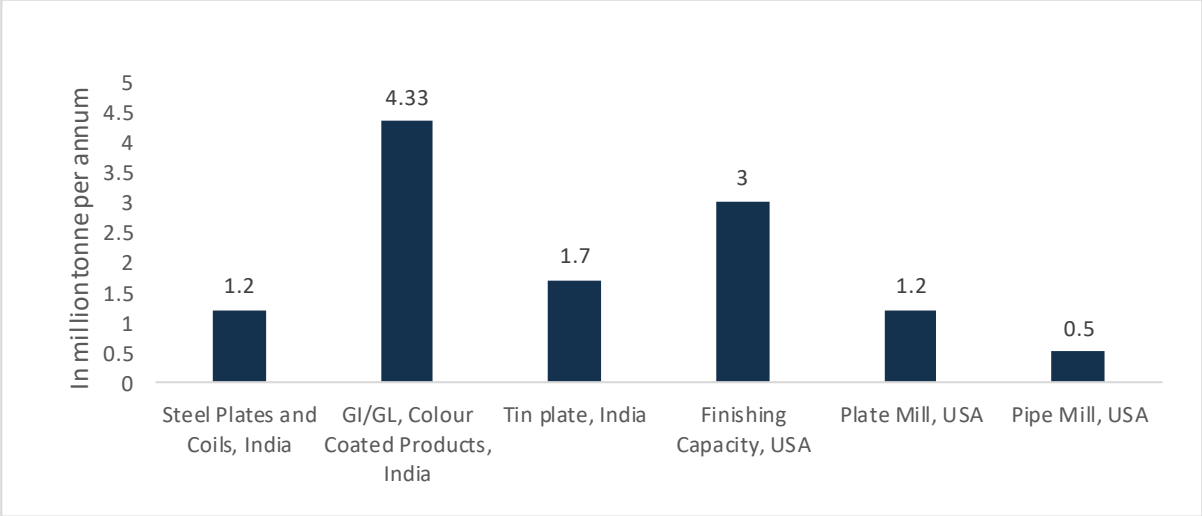
JSW Group is one of India's major business conglomerates and operates the steel business under JSW Steel Limited. The company's domestic crude steel capacity, which includes capacities of Bhushan Power and Steel Limited (BPSL) and JSW Ispat Special Products Ltd., was 27.7 MTPA as of March 31, 2023. Additionally, it has manufacturing capacity of 1.5 MTPA in the USA (including capacities under joint control) and 18 MTPA in Italy. The company has 13 captive iron ore mines in Karnataka and Odisha.

Chart 51: JSW Steel: Crude Steel Capacity Break-up as on March 31, 2023



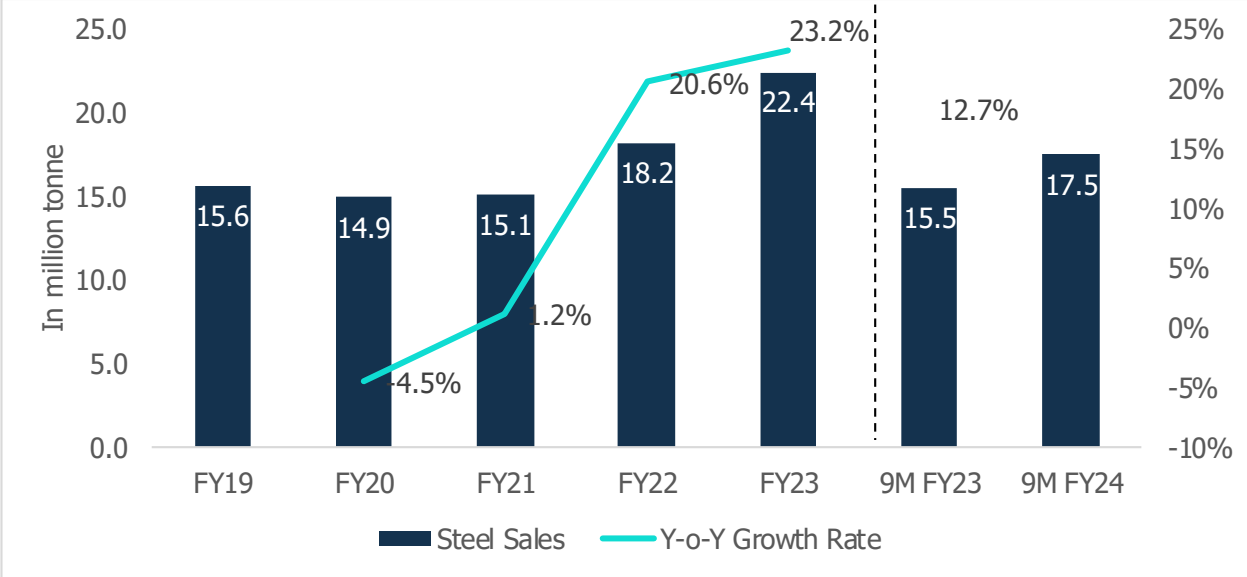
Source: Company Reports, CareEdge Research

Chart 52: JSW Steel: Finishing/Downstream Capacity Break-up as on March 31, 2023



Source: Company Reports, CareEdge Research

Chart 53: JSW Steel: Trend in Steel Sales (Consolidated)



Source: Company Reports, CareEdge Research

Table 12: JSW Steel – Consolidated Financials (in Rs. crore)

	FY19	FY20	FY21	FY22	FY23	9M FY23	9M FY24
Revenue	84,757	72,610	79,839	1,46,371	1,65,960	1,18,998	1,28,737
EBITDA	18,922	10,932	20,059	39,183	19,001	11,070	22,627
EBITDA Margin	22.32%	15.06%	25.12%	26.77%	11.45%	9.30%	17.58%
PAT	7,524	3,919	7,873	20,938	4,139	398	7,651
PAT Margin	8.88%	5.40%	9.86%	14.30%	2.49%	0.33%	5.94%

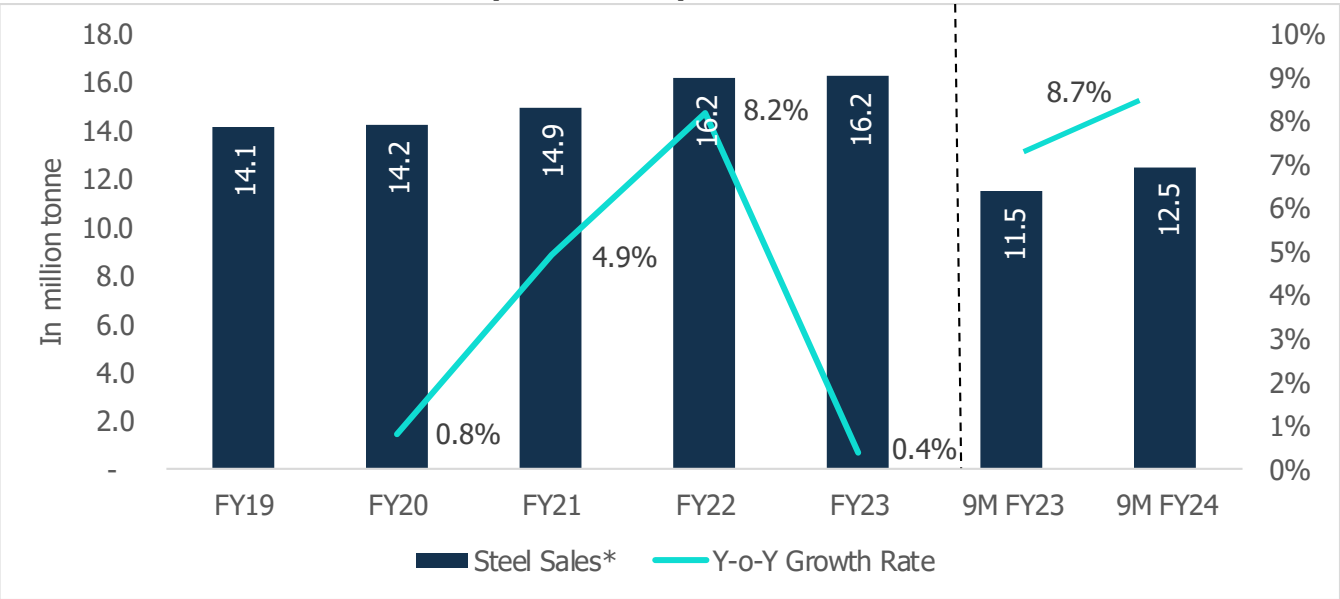
Source: Company Reports, CareEdge Research

5.1.3 Steel Authority of India Limited (SAIL)

SAIL is a central public sector undertaking under the ownership of the Ministry of Steel, Government of India. The company's crude steel production capacity is 20.63 MTPA. Primarily based in the eastern and central areas of India, SAIL produces iron and steel in five integrated plants and three special steel plants. The company's product line includes a wide range of items, such as PM plates, electrical steels, railway products, semis, wire rods, etc.

SAIL has iron ore mines in Jharkhand, Odisha and Chhattisgarh, collieries in Jharkhand and West Bengal, and flux mines in Jharkhand and Madhya Pradesh.

Chart 54: SAIL: Trend in Steel Sales (Consolidated)



Source: Company Reports, CareEdge Research

Table 13: SAIL – Consolidated Financials (in Rs. crore)

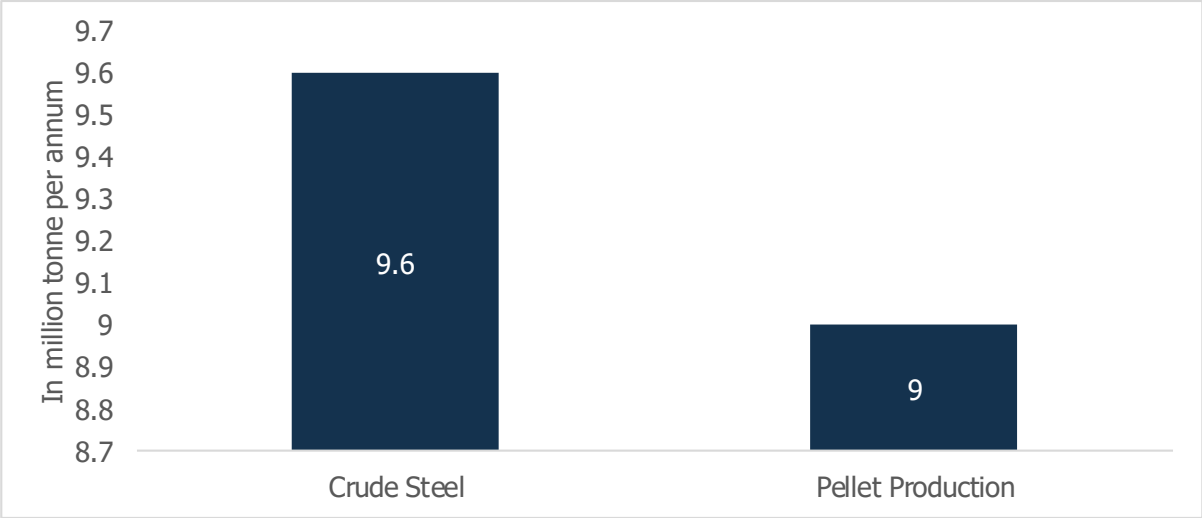
	FY19	FY20	FY21	FY22	FY23	9M FY23	9M FY24
Gross Revenue	66,974	61,664	69,114	1,03,477	1,04,448	75,317	77,420
EBITDA	9,595	9,638	13,265	21,406	8,943	5,786	7,622
EBITDA Margin	14.33%	15.63%	19.19%	20.69%	8.56%	7.68%	9.84%
PAT	2,349	2,121	4,148	12,243	2,177	1,017	1,941
PAT Margin	3.51%	3.44%	6.00%	11.83%	2.08%	1.35%	2.51%

Source: Company Reports, CareEdge Research

5.1.4 Jindal Steel and Power Limited (JSPL)

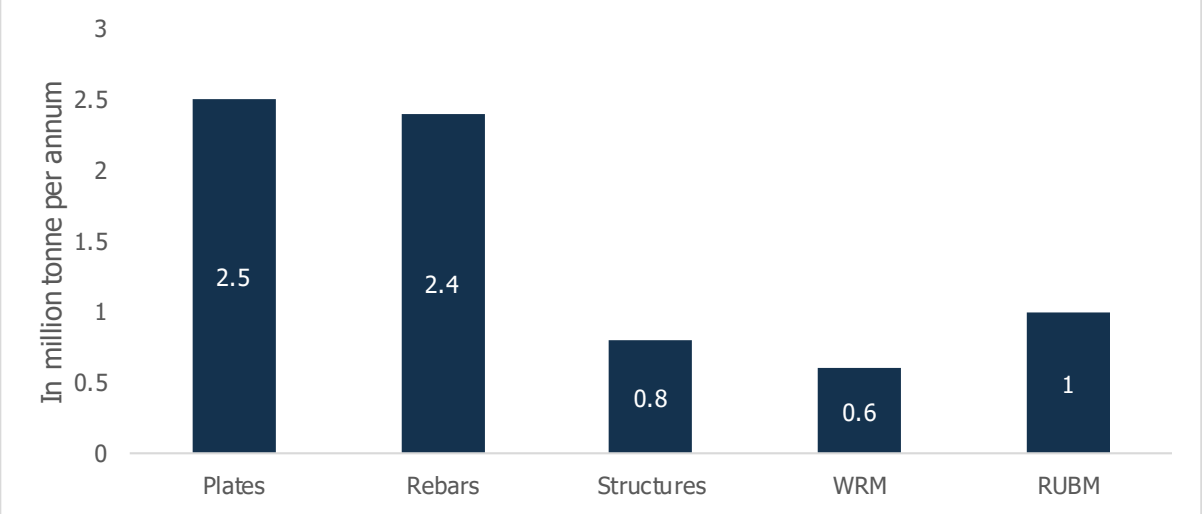
JSPL is a domestic steel manufacturer with a crude steel capacity of 9.6 MTPA as of March 31, 2023 and a 1,634 MW operational captive power plant (CPP) capacity. The company operates two iron ore and three coal mines in India. It also has iron ore assets in Namibia and South Africa and coal assets in Mozambique, Botswana, South Africa, and Australia.

Chart 55: JSPL: Crude Steel & Pellet Capacity as on March 31, 2023



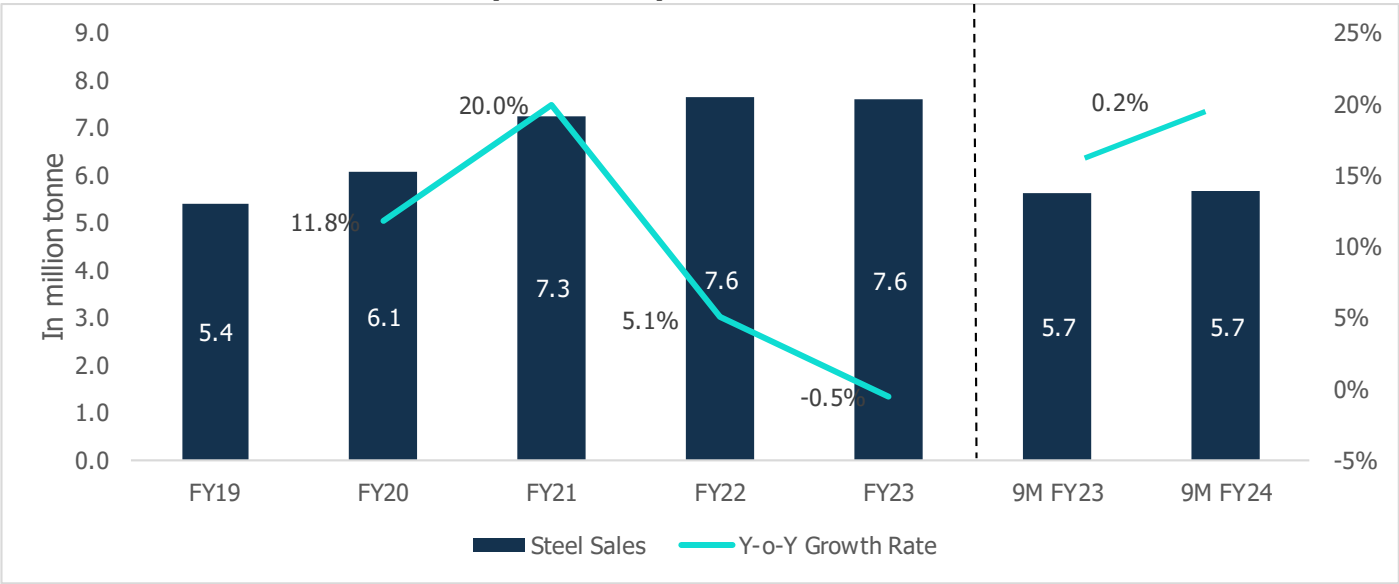
Source: Company Reports, CareEdge Research

Chart 56: JSPL: Finished Steel Capacity as on March 31, 2023



Source: Company Reports, CareEdge Research

Chart 57: JSPL: Trend in Steel Sales (Standalone)



Source: Company Reports, CareEdge Research

Table 14: JSPL – Consolidated Financials (in Rs. crore)

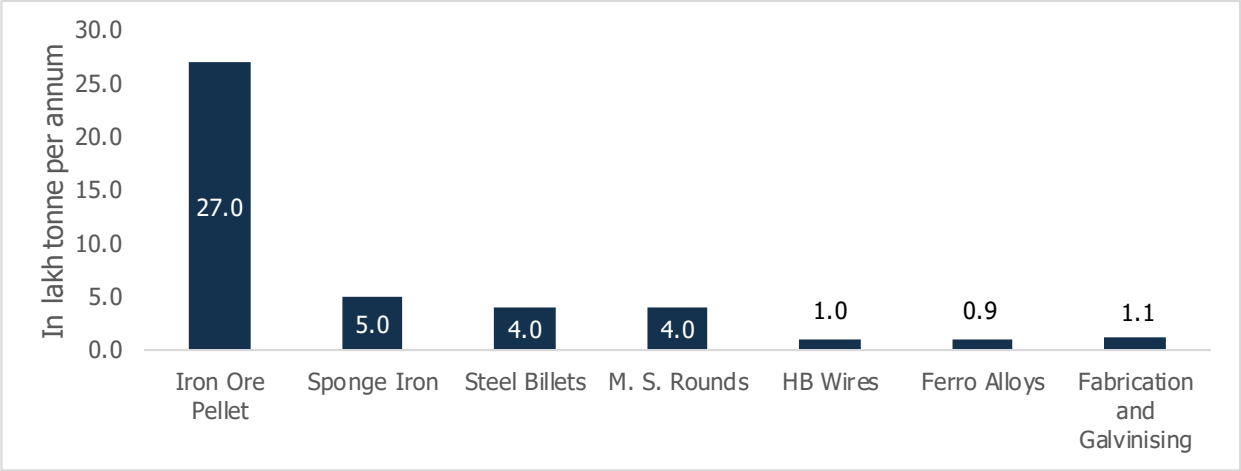
	FY19	FY20	FY21	FY22	FY23	9M FY23	9M FY24
Gross Revenue	43,602	34,360	38,322	56,921	61,005	45,213	42,501
EBITDA	6,927	7,636	12,887	15,107	8,565	6,532	7,756
EBITDA Margin	21.33%	21.27%	37.90%	30.37%	18.85%	14.45%	18.25%
PAT	-2,412	-574	4,267	6,766	3,974	3,508	5,010
PAT Margin	-5.53%	-1.67%	11.13%	11.89%	6.51%	7.76%	11.79%

Source: Company Reports, CareEdge Research

5.1.5 Godawari Power and ISPAT Limited (GPIL)

Godawari Power & Ispat Ltd. (formerly known as Ispat Godawari Ltd), a public limited company, is a member of the HIRA Group of Industries, located in Raipur. The company is a vertically integrated steel manufacturer with a pellet plant and steel plant in Raipur. The steel plant manufactures sponge iron, billets, MS rounds, HB wires, ferroalloys, and pre-fab structures. Moreover, the company manufactures ferro alloys under its subsidiaries and operates wind & solar power plants with an aggregate capacity of 236 MW. GPIL operates two captive iron ore mines in Chhattisgarh.

Chart 58: GPIL: Capacity as of March 31, 2023



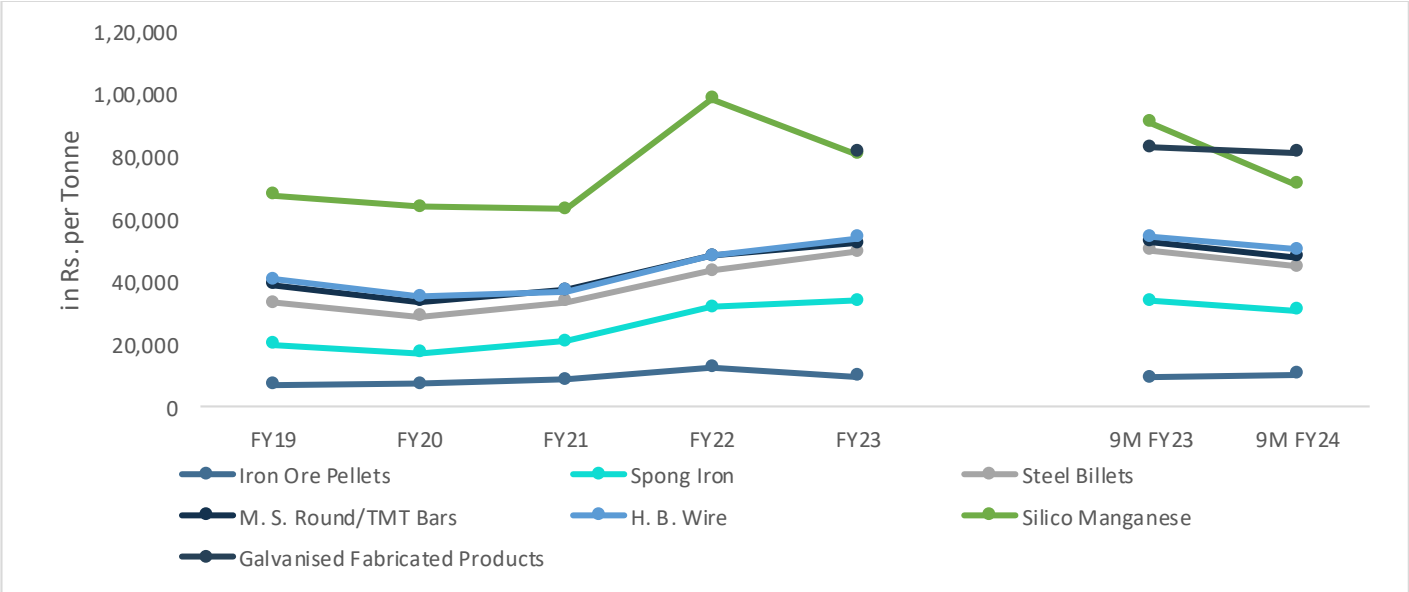
Source: Company Reports, CareEdge Research

Table 15: GPIL – Product-wise Sales Volume Trend (in Tonnes)

	FY19	FY20	FY21	FY22	FY23	9M FY23	9M FY24
Iron Ore Pellets - GPIL	14,52,549	13,62,296	16,07,881	16,64,030	19,79,415	10,97,722	14,06,137
Sponge Iron	1,40,218	1,31,419	1,04,289	1,26,371	1,25,575	54,837	1,17,973
Steel Billets	1,21,632	1,63,381	1,37,136	91,486	1,45,186	1,64,302	1,22,190
M. S. Round/TMT Bars	79,099	80,297	1,65,434	1,92,942	1,16,736	1,20,284	1,00,065
H. B. Wire	1,34,558	1,29,015	1,01,017	36,572	52,940	57,190	41,437
Ferro Alloys/Silico Manganese	7,664	7,210	47,168	72,628	57,795	44,162	44,064
Galvanised Fabricated Product	26,240	31,858	28,128	52,722	72,882	56,839	47,598

Source: Company Reports, CareEdge Research

Chart 59: GPIL: Trend in Realization



Source: Company Reports, CareEdge Research

Table 16: GPIL – Consolidated Financials (in Rs. crore)

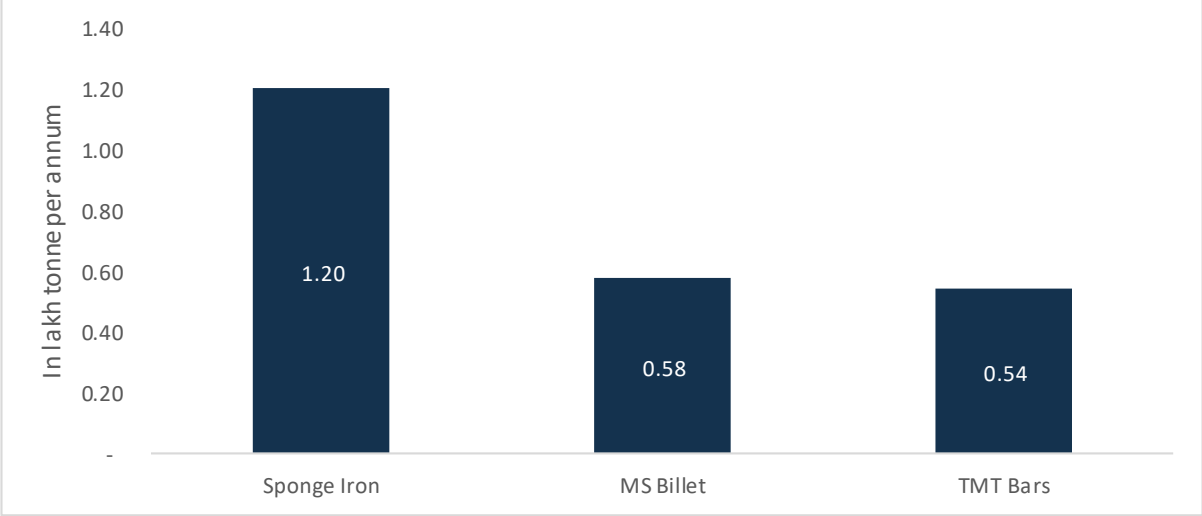
	FY19	FY20	FY21	FY22	FY23	9M FY23	9M FY24
Gross Revenue	3,322	3,289	3,958	5,399	5,753	4,436	3,926
EBITDA	789	624	1,134	1,835	1,029	889	1,029
EBITDA Margin	24%	19%	29%	35%	20%	20%	26%
PAT	261	174	627	1,481	793	624	717
PAT Margin	7.86%	5.29%	15.84%	27.43%	13.79%	14.06%	18.26%

Source: Company Reports, CareEdge Research

5.1.6 Vraj Iron and Steel Private Limited (VISL)

Incorporated in 2004, VISL is engaged in manufacturing sponge iron, M.S. Billets, and TMT bars along with waste heat recovery based captive power plant of 5 MW. The majority stake in the company is held by Gopal Sponge and Power Private Limited, a Raipur-based manufacturer of sponge iron and ingots. The manufacturing operation of the group is semi-integrated in nature with sponge iron plants, ingots/billets, and rolled products facilities derived from sponge iron & billets.

Chart 60: VISL: Capacity as on March 31, 2023



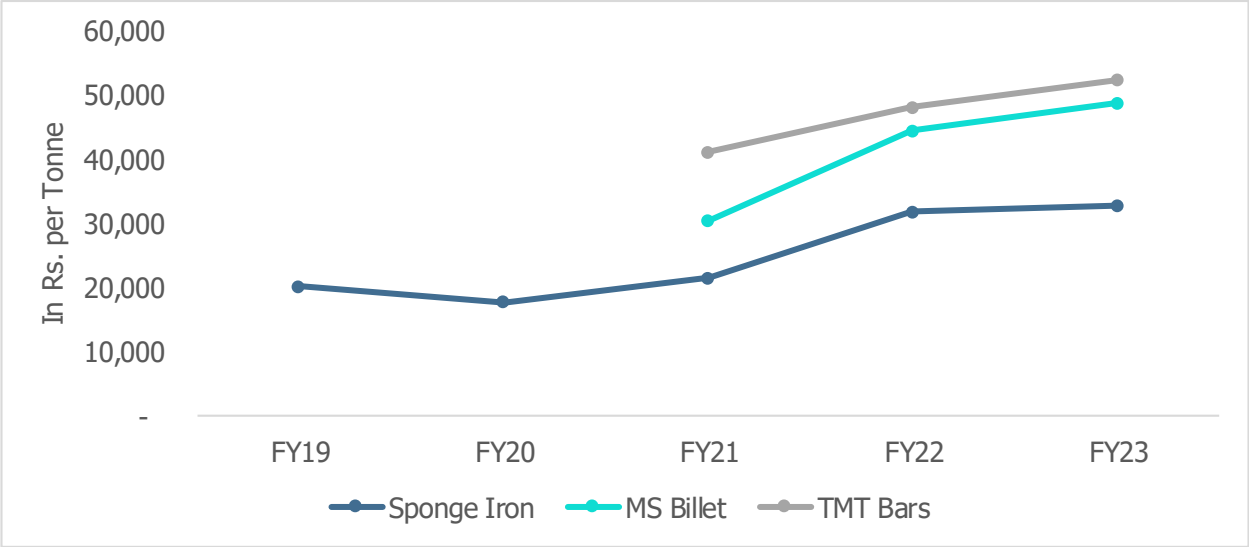
Source: Company Reports, CareEdge Research

Table 17: VISL – Product-wise Sales Volume Trend (in Tonnes)

	FY19	FY20	FY21	FY22	FY23
Sponge Iron	58,558	52,937	70,651	75,967	82,269
MS Billet	-	-	27,801	11,787	10,510
TMT Bars	-	-	10,879	21,071	34,431

Source: Company Reports, CareEdge Research

Chart 61: VISL : Trend in Realization



Source: Company Reports, CareEdge Research

Table 18: VISL – Consolidated Financials (in Rs. crore)

	FY19	FY20	FY21	FY22	FY23	9MFY24
Gross Revenue	123	121	291	414	516	301
EBITDA	18	12	29	49	80	62
EBITDA Margin	14.9%	9.8%	9.9%	11.9%	15.4%	20.5%
PAT	12	6	11	29	54	45
PAT Margin	9.4%	4.8%	3.8%	6.9%	10.5%	14.8%

Source: Company Reports, CareEdge Research

5.1.7 ESL Steel Limited (ESL)

ESL, a part of the Vedanta Group, is an integrated steel company. The company currently has a capacity of 1.7 MTPA hot metal production. ESL has a captive iron ore mine in Odisha. Its product range includes wire rods, billets, TMT bars, ductile iron pipes, and pig iron.

Chart 62: ESL – Saleable Volumes Trend

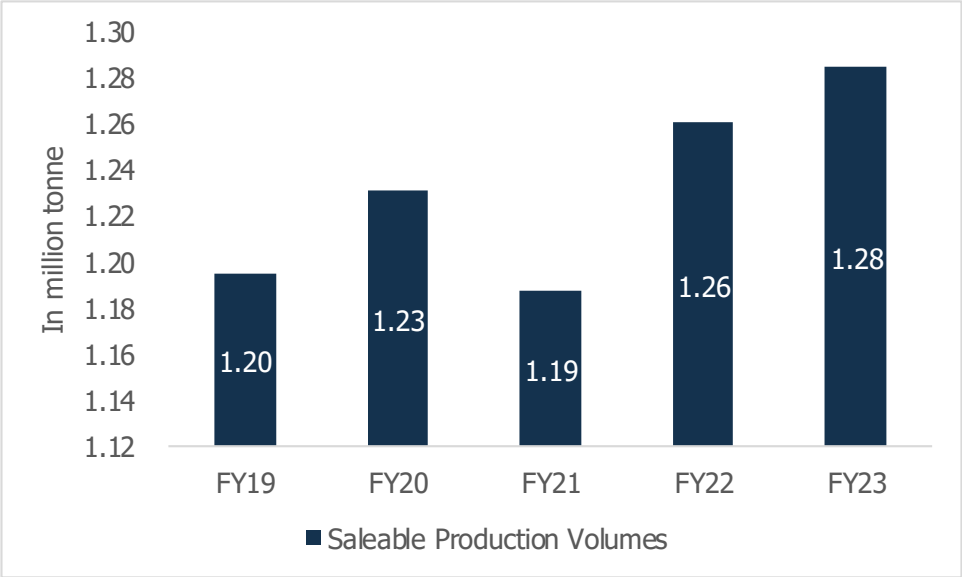


Table 19: ESL – Consolidated Financials (in Rs. crore)

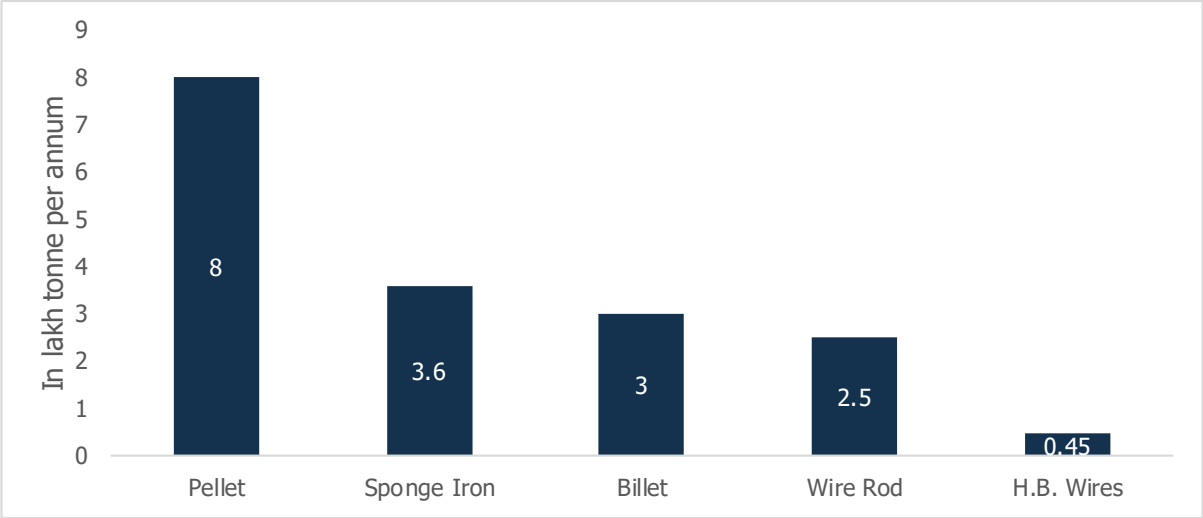
	FY19	FY20	FY21	FY22	FY23
Gross Revenue	4,871	4,294	4,668	6,474	7,852
EBITDA	1,758	565	573	504	1,216
EBITDA Margin	36.1%	13.2%	12.3%	7.8%	15.5%
PAT	1,187	-22	2,732	-95	-558
PAT Margin	24.4%	-0.5%	58.5%	-1.5%	-7.1%

Source: Company Reports, CareEdge Research

5.1.8 Sarda Energy & Minerals Limited (SEML)

Sarda Energy & Minerals Limited, part of the Sarda Group, is a manufacturer of steel products such as sponge iron, billets, ferroalloys, pellets, wire rod millet, etc. It has waste, heat, and coal-based power plants and an interest in hydropower assets through its SPVs. The company also has iron ore and manganese mines in India.

Chart 63: SEML: Capacity as of March 31, 2023



Source: Company Reports, CareEdge Research
Note: The company also has a ferro alloys manufacturing capacity of 147 MVA

Table 20: SEML – Product-wise Sales Volume Trend (in '000 Tonnes)

	FY19	FY20	FY21	FY22	FY23	9M FY23	9M FY24
Sponge Iron	148	161	131	121	82	54	73
Steel Billets	33	30	26	26	33	25	25
Wire Rod	97	118	121	127	151	109	114
H.B. Wires	20	21	27	32	40	29	29
Ferro Alloys	139	123	135	158	157	105	149

Source: Company Reports, CareEdge Research

Table 21: SEML – Consolidated Financials (in Rs. crore)

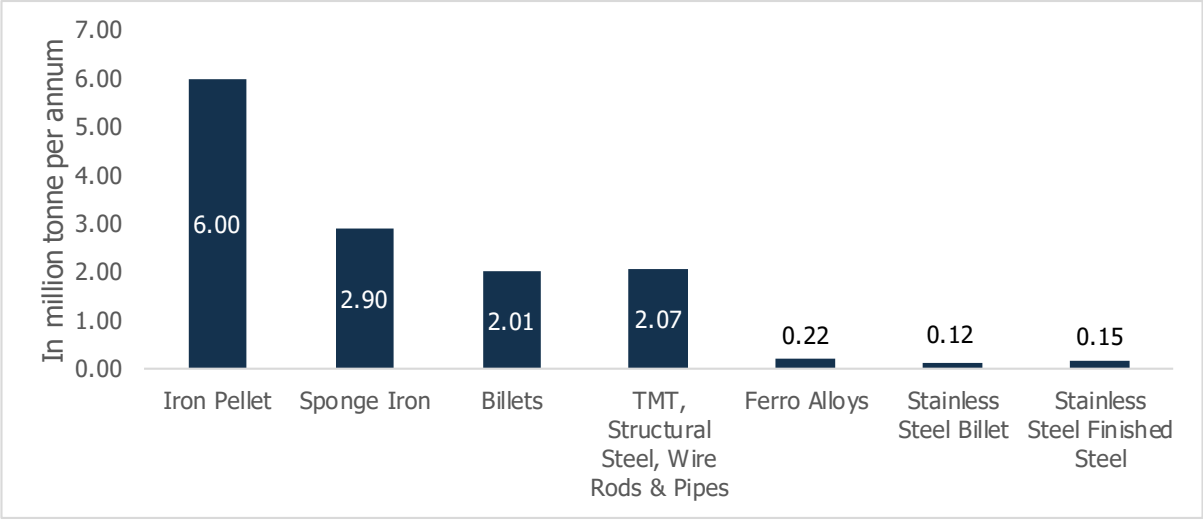
	FY19	FY20	FY21	FY22	FY23	9M FY23	9M FY24
Gross Revenue	2,324	2,000	2,199	3,914	4,212	3,136	2,979
EBITDA	482	322	505	1,348	1,060	846	644
EBITDA Margin	20.8%	16.1%	23.0%	34.4%	25.2%	27.0%	21.6%
PAT	207	128	376	807	604	489	436
PAT Margin	8.9%	6.4%	17.1%	20.6%	14.3%	15.6%	14.6%

Source: Company Reports, CareEdge Research

5.1.9 Shyam Metalics and Energy Limited (SMEL)

SMEL's products include iron pellets, sponge iron, steel billets, TMT wire rod & structural mills, and ferroalloy. The company's aggregate metal production capacity is 13.2 MTPA. Currently, it has captive power plants with a capacity of 597 MW and a renewable power generation capacity of 109 MW.

Chart 64: SMEL: Product-wise Capacity



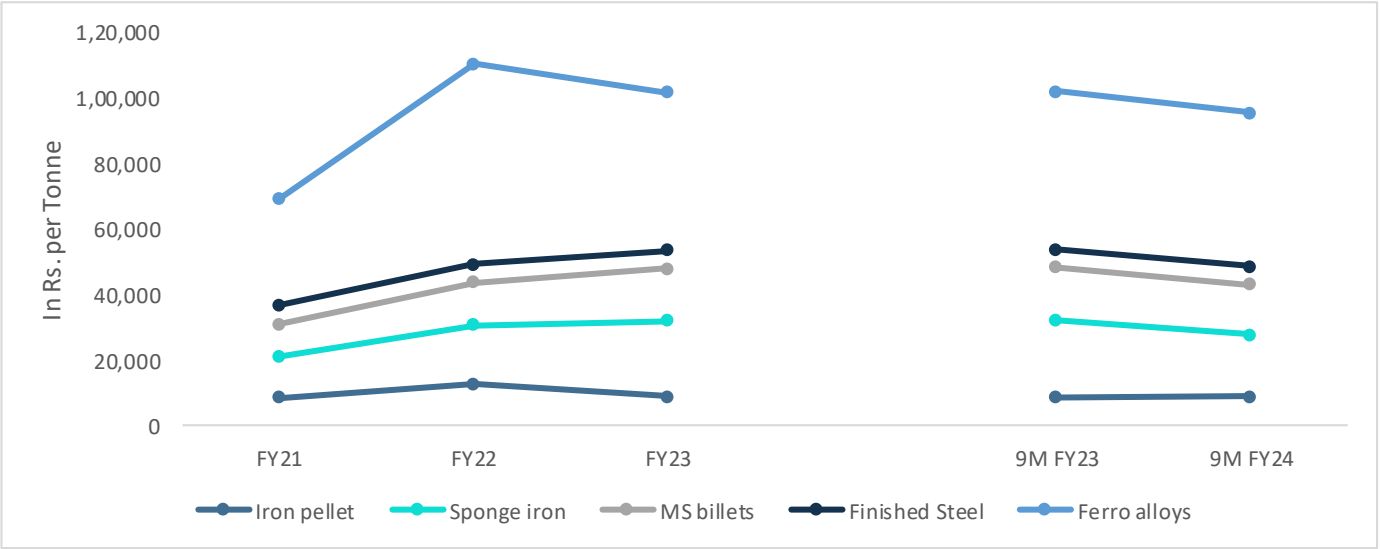
Source: Company Reports, CareEdge Research

Table 22: SMEL – Product-wise Sales Volume Trend (in Lakh Tonnes)

_	FY19	FY20	FY21	FY22	FY23	9M FY23	9M FY24
Finished Steel	1.9	2.9	6.1	7.6	11.2	7.8	9.5
Intermediaries	10.2	8.8	5.7	8.1	8.1	6.3	7.2
Ferro Products	1.5	1.5	1.7	1.6	1.8	1.3	1.3
Iron Pellet	7.3	9.9	17.7	14.7	12.1	9	8.2

Source: Company Reports, CareEdge Research

Chart 65: SMEL: Product-wise Realization Trend



Source: Company Reports, CareEdge Research

Table 23: SMEL – Consolidated Financials (in Rs. crore)

	FY20	FY21	FY22	FY23	9MFY23	9MFY24
Gross Revenue	4,376	6,297	10,394	12,610	9,589	9,230
EBITDA	666	1,394	2,600	1,486	1,128	1,073
EBITDA Margin	15.22%	22.14%	25.01%	11.78%	11.77%	11.62%
PAT	340	844	1,724	848	810	590
PAT Margin	7.8%	13.4%	16.6%	6.7%	8.4%	6.4%

Source: Company Reports, CareEdge Research

5.2 Comparison of Key Operational & Financial Parameters

5.2.1 Financial Parameters

a. EBITDA Margin

The tables below show the last 5 years and the H1FY23 trend of consolidated EBITDA and PAT margin for the key players in the steel industry. In FY23, increase in coking coal cost resulted in increase in the production cost per tonne, which led to a decline in EBITDA and PAT margin.

Table 24: EBITDA Margin (Consolidated)

	FY19	FY20	FY21	FY22	FY23	9M FY23	9M FY24
Tata Steel*#	18.9%	12.2%	19.8%	26.2%	13.4%	14.1%	4.9%
JSW Steel#	22.4%	16.2%	25.2%	26.6%	11.2%	9.3%	17.6%
SAIL	14.3%	15.6%	19.2%	20.7%	8.6%	7.7%	9.8%
JSPL#	21.3%	21.3%	37.9%	30.4%	18.9%	14.4%	18.2%
GPIL	24.0%	19.0%	29.0%	35.0%	20.0%	20.0%	26.2%
PIPL	14.8%	9.9%	9.9%	11.9%	15.4%	NA	20.5%
ESL	36.1%	13.2%	12.3%	7.8%	15.5%	NA	NA
SEML	20.8%	16.1%	23.0%	34.4%	25.2%	27.0%	21.6%
SMEL#	20.3%	14.6%	22.1%	25.0%	11.8%	11.6%	11.8%

Source: Company Reports, CareEdge Research

Note: (#) stands for reported figures.

b. PAT Margin

Table 25: PAT Margin

	FY19	FY20	FY21	FY22	FY23	9M FY23	9M FY24
Tata Steel*	5.8%	0.8%	5.2%	17.1%	3.3%	3.6%	-3.2%
JSW Steel	8.9%	5.4%	9.9%	14.3%	2.5%	0.3%	5.9%
SAIL	3.5%	3.4%	6.0%	11.8%	2.1%	1.4%	2.5%
JSPL	-5.5%	-1.7%	11.1%	11.9%	6.5%	7.8%	11.8%
GPIL	7.9%	5.3%	15.8%	27.4%	13.8%	14.1%	18.3%
PIPL	9.4%	4.8%	3.8%	6.9%	10.5%	NA	14.8%
ESL	24.4%	-0.5%	58.5%	-1.5%	-7.1%	NA	NA
SEML	8.9%	6.4%	17.1%	20.6%	14.3%	15.6%	14.6%
SMEL	NA	7.8%	13.4%	16.6%	6.7%	6.4%	8.4%

Source: Company Reports, CareEdge Research

c. Leverage Ratios

1) Net-Debt to EBITDA

The steel manufacturing business is a CapEx-intensive business, wherein steel players expand their capacity through a mix of debt and equity.

The trend in leverage ratios of key steel players in India is given below-

Table 26: Net- Debt to EBITDA

	FY19	FY20	FY21	FY22	FY23	H1FY24
Tata Steel#	3.19	5.91	2.44	0.80	2.07	3.53
JSW Steel#	2.40	4.50	2.61	1.45	3.20	2.51
SAIL	4.31	5.29	2.65	0.62	2.86	2.41
JSPL#	4.66	4.57	1.24	0.57	0.70	0.77
GPIL	2.26	2.60	0.78	0.23	-0.19	-0.10
VISL	2.29	4.12	1.57	0.86	0.28	NA
ESL	1.83	5.56	5.58	5.55	1.95	NA
SEML	2.67	4.60	3.30	1.01	1.32	1.26
SMEL#	0.48	1.51	0.18	-0.18	0.30	0.74

Source: Company Reports, CareEdge Research

Note: (#) stands for reported figures

2) Net-Debt to Equity

Table 27: Net- Debt to Equity

	FY19	FY20	FY21	FY22	FY23	9MFY23	9MFY24
Tata Steel#	1.43	1.42	0.98	0.52	0.61	0.65	0.78
JSW Steel#	1.34	1.48	1.17	0.83	0.89	1.23	1.17
SAIL	1.04	1.23	0.77	0.24	0.47	NA	NA
JSPL*#	1.23	1.15	0.92	0.35	0.32	NA	NA
GPIL	1.33	1.08	0.42	0.12	-0.05	NA	NA
VISL	0.31	0.30	0.81	0.50	0.17	NA	0.27
ESL	0.89	0.90	0.51	0.46	0.43	NA	NA
SEML	0.69	0.75	0.72	0.44	0.40	NA	NA
SMEL#	0.18	0.34	0.07	-0.08	0.07	NA	NA

Source: Company Reports, CareEdge Research

Note: (#) stands for reported figures. * Denotes debt to equity

d. Consolidated Financial metrics- Comparison for 9MFY24

Table 28: FY23 Company-Wise Financials Comparison

	Revenue	PAT	Gross Profit Margin	EBITDA Margin	PAT Margin
Tata Steel	1,70,483	-5,464	57%	4.9%	-3.2%
JSW Steel	1,28,737	7,651	60%	17.6%	5.9%
SAIL	77,420	1,941	49%	9.8%	2.5%
JSPL	42,501	5,010	63%	18.2%	11.8%
GPIL	3,926	716.74	46%	27.7%	18.3%
PIPL	301	45	34%	20.5%	14.8%
ESL	NA	NA	NA	NA	NA
SEML	2,979	436.05	38%	21.6%	14.6%
SMEL	9,589	809.66	28%	11.8%	8.4%

Note: (#) stands for reported figures

e. Crude Steel Capacity for FY23

Table 29: Crude Steel Capacity & Utilization for FY23

	Capacity Installed (MTPA)	Capacity Utilized
Tata Steel	21.00	95%
JSW Steel	27.70	79%
SAIL	20.63	89%
JSPL	9.60	82%

Source: Company Reports

Note: Capacity mentioned above is for India

Table 30: Steel Product- Wise Capacity for FY23

(MTPA)	Iron Pellet	Sponge Iron	Billets	TMT / Structural Steel/ Wire Rods & Pipes	Ferro Alloys	H. B. Wires	M.S Rounds	Fabrication & Galvanising
GPIL	2.70	0.50	0.4	NA	0.09	0.1	0.4	0.11
VISL	NA	0.12	0.06	0.05	NA	NA	NA	NA
SEML	0.8	0.36	0.3	0.25	NA	0.045	NA	NA
SMEL	4.8	2.54	1.69	1.97	0.22	NA	NA	NA

Source: Company Reports

Table 31: Product- Wise Capacity Utilization for FY23

	Iron Pellet	Sponge Iron	Billets	TMT, Structural Steel, Wire Rods & Pipes	Ferro Alloys	H. B. Wires	M.S Rounds
GPIL	85%	99.99%	81%	NA	99.95%	54%	43%
VISL	NA	95%	79%	63%	NA	NA	NA
SEML	100%	81%	76%	76%	NA	87%	NA
SMEL	25%	NA	NA	NA	98%	NA	NA

Source: Company Reports

6 Minimum Economic Size and Capex – Sponge Iron, Billets and TMT Bars/Rods Plants

Typically, players who have integrated plants install billets and TMT bars capacities in line with their crude steel manufacturing capacities. The minimum economic size for the sponge iron, billet, and TMT bars manufacturing plants is summarized in the following table along with the CapEx required.

Table 32: Minimum Economic Size (MES) and Capex Requirement

Product	Minimum Economic Size	Capex cost
Sponge Iron	350 tonnes per day	Rs. 70-80 crore
Billets	180-200 tonnes per day	Rs. 20-25 crore
TMT Bars	1 lakh tonnes per annum	Rs. 45-50 crore

Source: Industry Sources, CareEdge Research

Note: Above capex cost estimates exclude land cost, soft cost etc.

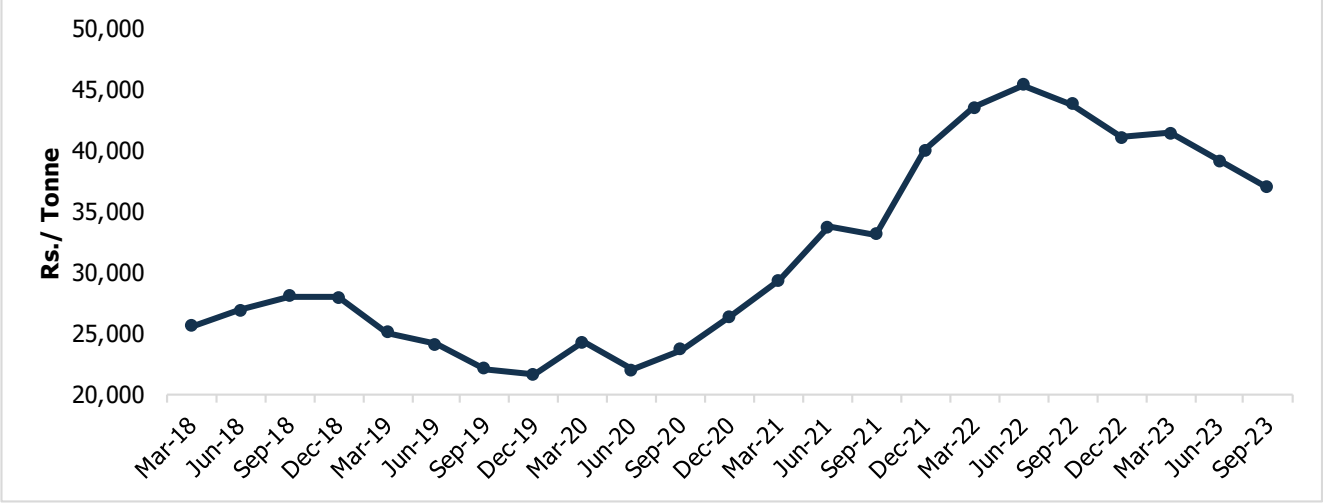
7 Pricing Assessment

7.1 Average Pricing of Sponge Iron and TMT Bars

Sponge Iron

Domestic sponge iron prices were around an average of Rs, 25,000 per tonne between March 2018 and December 2020. Subsequently, the prices started to spike from March 2021 in line with steel prices to reach a high of Rs 45,303 per tonne in the quarter ended June 2022. The average price of sponge iron fell to Rs. 43,803 per tonne in the September 2022 quarter and further to Rs. 41,077 per tonne in the December 2022 quarter. Whereas the average price of sponge iron marginally increased in the March 2023 quarter. However, subsequently, the prices have corrected to Rs. 39,128 per tonne in the June 2023 quarter and Rs. 36,939 per tonne in the September 2023 quarter.

Chart 66: Trend in Prices of Sponge Iron (HBI) in Domestic Market

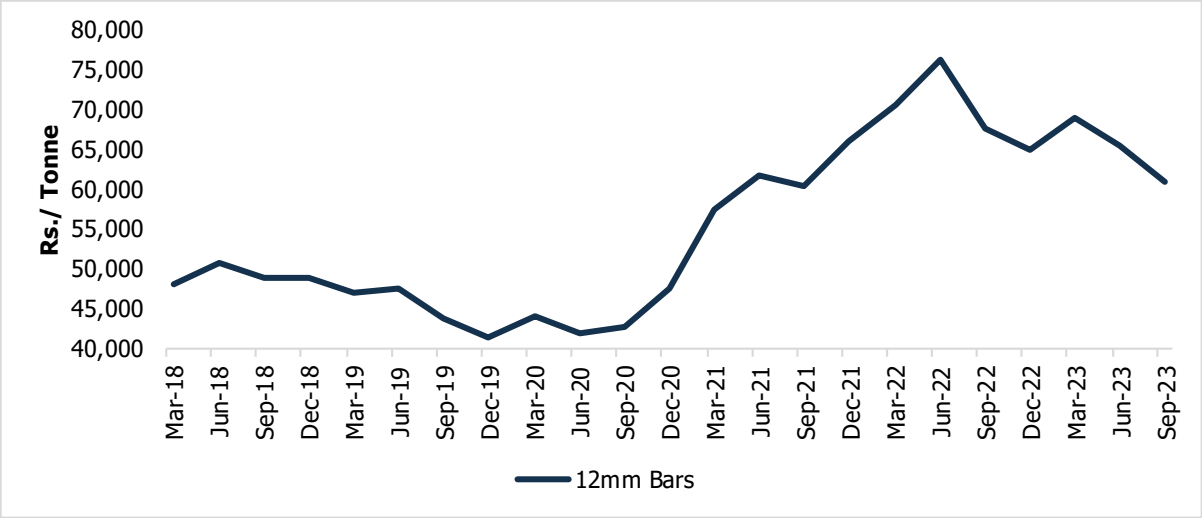


Source: CMIE

TMT Bars/ Rods

TMT bar prices averaged around Rs 46,000 per tonne between the March 2018 to September 2020 quarters. Subsequently, the prices started to rise in line with steel prices to reach a high of Rs. 76,277 per tonne in the June 2022 quarter. Prices of TMT bars have corrected from thereon to Rs 61,054 per tonne in the September 2023 quarter.

Chart 67: Trend in Prices of TMT Bars



Source: CMIE

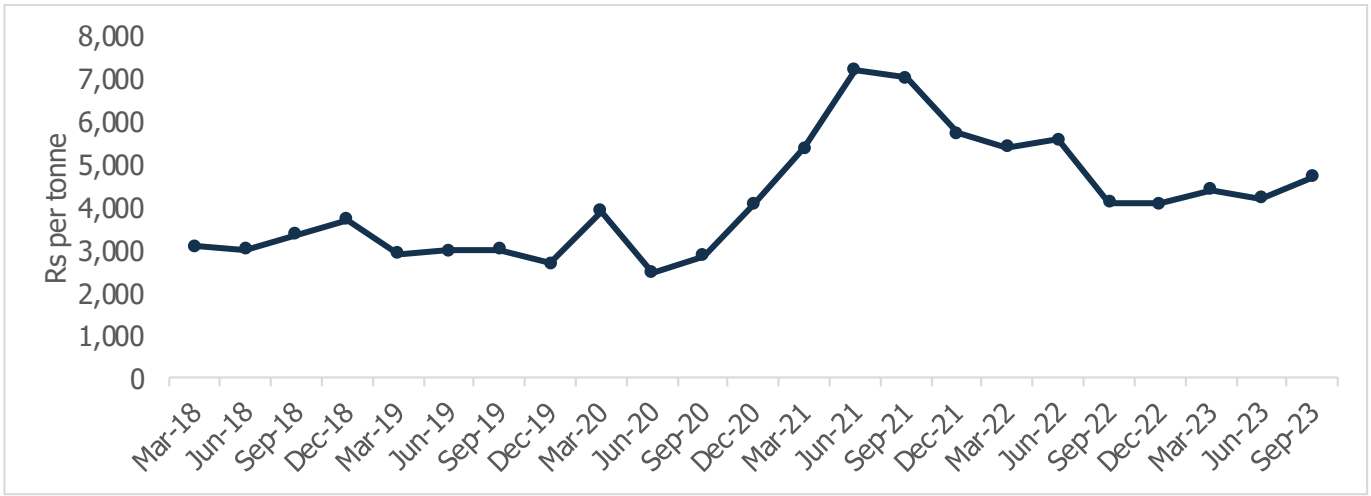
Note: Prices are average of Mumbai, Delhi, Chennai and Kolkata prices

7.2 Historical Pricing of Key Raw Materials

Trend in Iron Ore Prices

After the reduced export duty on iron ore in November 2022, domestic prices began to rise. In January 2023, NMDC increased the prices for iron ore lumps and fines, which further boosted the prices. As of the quarter ended March 2023, iron ore prices stood at Rs. 4,383 per tonne, a growth of 8% as compared to the quarter ended December 2022. However, the prices of iron ore observed a fall of 4.5% q-o-q in the quarter ending June 2023 due to weak global demands, especially from China (the largest consumer of iron ore) as the recovery was slower than expected. The prices have exhibited an increase in trend during the quarter ended September 2023 with a growth rate of 11.4% q-o-q and 14.5% y-o-y.

Chart 68: Domestic Iron Ore Prices



Source: CMIE

Trend in Coking Coal Prices

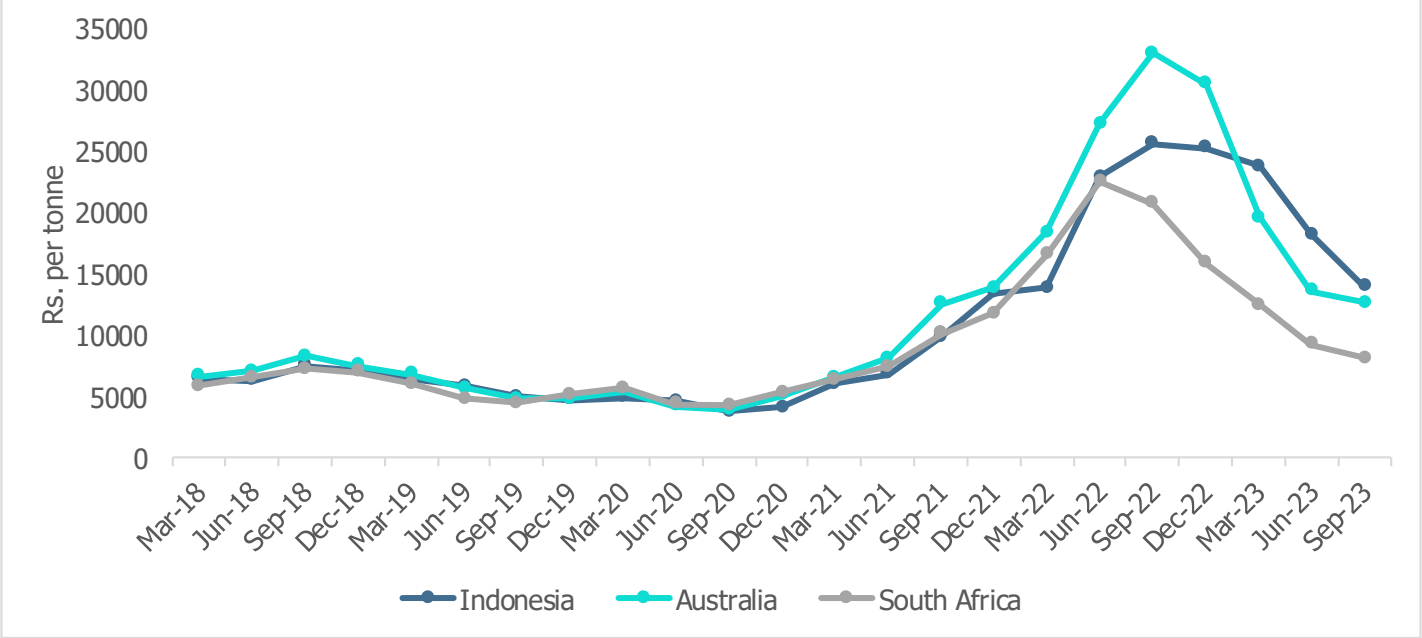
The international coal prices remained fairly range-bound during March 2018 to September 2019. However, prices declined sharply and fell to Rs. 3,734 per tonne by August 2020 as coal demand was impacted due to COVID-19.

The coal prices started rising in CY21 due to the production cutbacks and supply disruptions. The coal prices also found tailwinds in the Russia-Ukraine war which commenced in February 2022, and resulted in the disruption of coal supplies to Europe. Whereas during FY23, the average coal prices for Indonesian coal, South African coal, and Australian coal were 122%, 56%, and 109% higher, respectively, as compared to prices during the previous year.

Coal prices have been softening since November 2022 as the increased supplies from South Africa and Columbia have alleviated the demand crunch in European countries caused by the reduction of coal imports from Russia. These factors have led to a reduction in international coal prices. As of the quarter ended September 2023, the average coal prices for Indonesian coal, South African, coal and Australian coal were 46%, 61% and 62% lower, respectively, as compared to prices during the same time period in FY23.

Furthermore, international coal prices of major global benchmarks are expected to be lower in FY24 compared to FY23. However, they will continue to be higher than pre-COVID years' averages as the global demand continues to remain high owing to increased demands, especially in China and India.

Chart 69: Prices of Coal

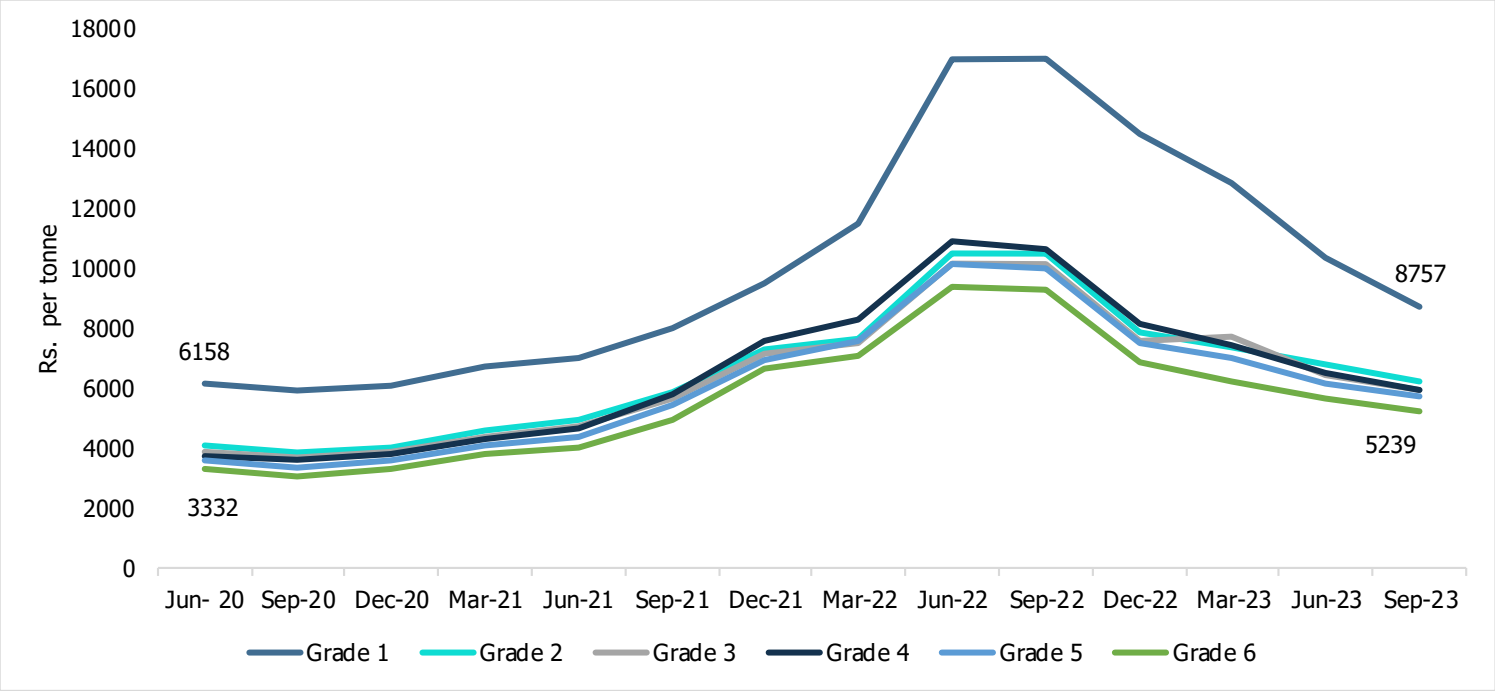


Source: World Bank

Note: Average currency rate for the respective quarter has been taken for the conversion.

Chart 70: Prices of Different Grades of Coal

The historical data of different types of grades (in Rs. / tonne) is depicted below:



Source: Ministry of Coal
Note: Prices for June, 2023 and Sep, 2023 are provisional

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