Industry Report

Structural Steel

21st March 2025

Disclaimer

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Dun & Bradstreet has prepared this study in an independent and objective manner, and it has taken all reasonable care to ensure its accuracy and completeness. We believe that this study presents a true and fair view of the industry within the limitations of, among others, secondary statistics, and research, and it does not purport to be exhaustive. The results that can be or are derived from these findings are based on certain assumptions and parameters/conditions. As such, a blanket, generic use of the derived results or the methodology is not encouraged.

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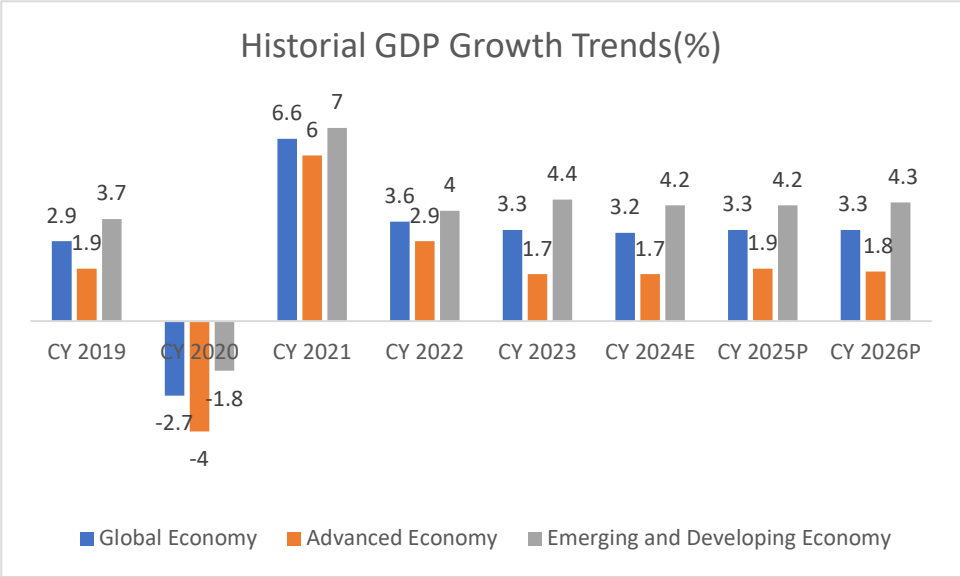
Global Economic Overview

The global economy, which grew by 3.3% in 2023, is expected to record a sluggish growth of 3.2% in 2024 before rising modestly to 3.3% in 2025. Between 2021-2022, global banks were carrying a historically high debt burden after COVID-19. Central banks took tight monetary measures to control inflation and spike in commodity prices. Russia's war with Ukraine further affected the global supply chains and inflated the prices of energy and other food items. These factors coupled with war-related economic sanctions impacted the economic activities in Europe. Any further escalation in the war may further affect the rebound of the economy in Europe.

While China, the largest manufacturing hub of world, was facing a crisis in the real estate sector and prices of properties were declining between 2020 - 2023, with the reopening of the economy, consumer demand is picking up again. The Chinese Government took several steps to help the real estate sector including cracking down on debt-ridden developers, announcing stimulus for the sector and measures to encourage the completion and delivery of unfinished real estate projects. The sector is now witnessing investments from developers and demand from buyers.

The year 2024 continued to remain a challenging year marked by uncertainties and transformative shifts. Numerous factors such as high inflation in many economies despite central bank effort to curb inflation, continuing energy market volatility driven by geopolitical tensions particularly in Ukraine and Middle East, and the re-election of Donald Trump as US President extended uncertainty around the trade policies as well as overall global economic growth. High inflation and rising borrowing costs affected the private consumption on one hand while fiscal consolidation impacted the government consumption on the other hand. As a result, global GDP growth is estimated to grow by 3.2% in CY 2024 as compared to 3.3% in CY 2023.

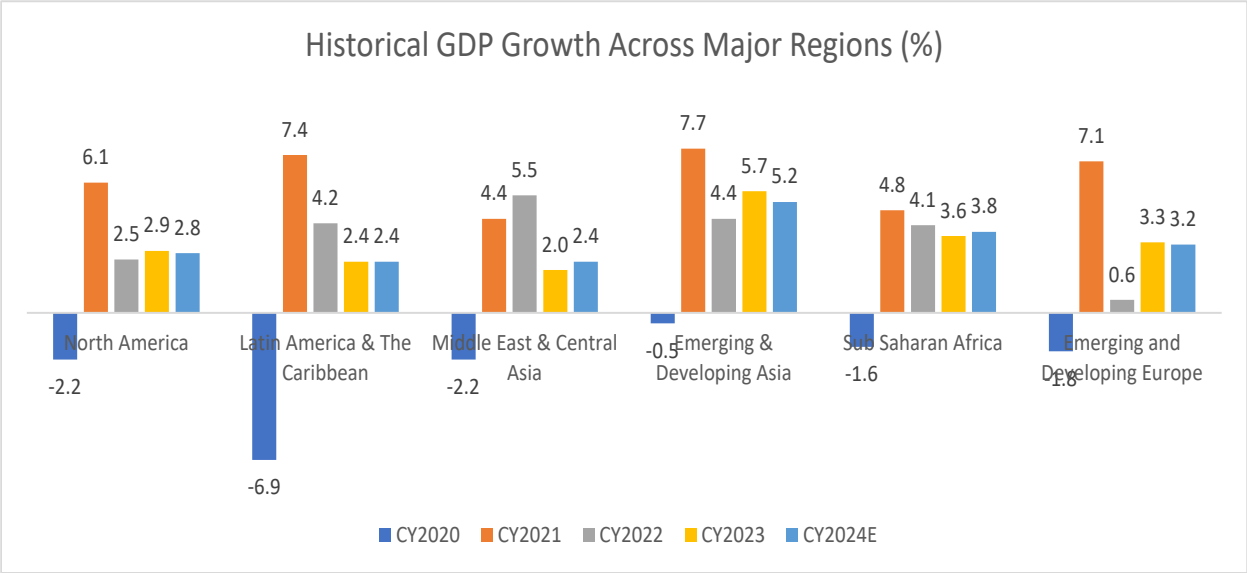


Source – IMF Global GDP Forecast Release January 2025

Note: Advanced Economies and Emerging & Developing Economies are as per the classification of the World Economic Outlook (WEO). This classification is not based on strict criteria, economic or otherwise, and it has evolved over time. It comprises of 40 countries under the Advanced Economies including the G7 (the United States, Japan, Germany, France, Italy, the United Kingdom, and Canada) and selected countries from the Euro Zone (Germany, Italy, France etc.). The group of emerging market and developing economies (156) includes all those that are not classified as Advanced Economies (India, China, Brazil, Malaysia etc.)

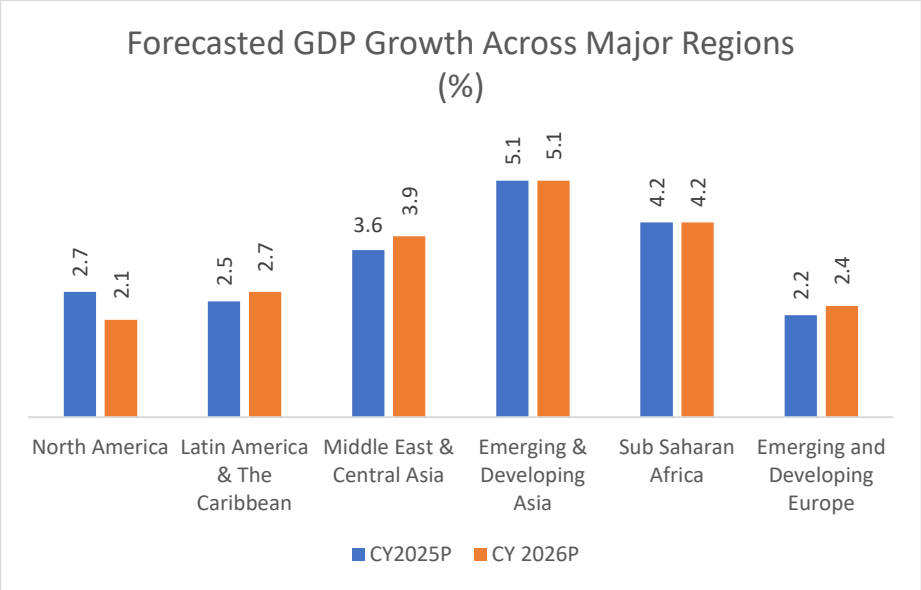
GDP Growth Across Major Regions

GDP growth of major regions including Emerging and Developing Europe, Latin America & The Caribbean, Middle East & Central Asia, and Sub-Saharan Africa, were showing signs of slow growth and recession between 2020 – 2023, but leaving Latin America & The Caribbean, 2024 is expected to show resilience and growth. Meanwhile, GDP growth in Emerging and Developing Asia (India, China, Indonesia, Malaysia, etc.) is expected to decrease from 5.2% in CY 2024 to 5.1% in CY 2025, while in the North America, it is expected to decrease from 2.8% in CY 2024 to 2.7% in CY 2025.



Source-IMF World Economic Outlook January 2025 update.

Except for Emerging and Developing Asia, Emerging and Developing Europe and North America, all other regions are expected to record an increase in GDP growth rate in CY 2025 as compared to CY 2024. Further, growth in the United States is expected to come down at 2.7% in CY 2025 due to lagged effects of monetary policy tightening, gradual fiscal tightening, and a softening in labour markets slowing aggregate demand. India and China saw greater-than-anticipated growth in 2023 due to heightened government spending and robust domestic demand, respectively. Sub-Saharan Africa's expected growth in 2024 is attributed to the diminishing negative impacts of previous weather shocks and gradual improvements in supply issues.



Source-IMF, OECD, and World Bank, D&B Estimates

Global Economic Outlook

As 2025 begins, there is some uncertainty due to the likely shift in policy following numerous elections around the world. New policies could lead to new trajectories for inflation, borrowing costs, and currency values, as well as trade flows, capital flows, and costs of production. Meanwhile, governments and central banks continue to navigate a balance between a desire to suppress inflation and a goal to boost growth.

Real GDP in advanced economies is projected to grow 1.9% in 2025, up from 1.7% in 2024. In the US, economic activity is expected to remain robust, supported by solid income and productivity, even as real GDP growth slips from 2.8% in 2024 to 2.1% in 2025. In Europe, steady income growth and falling interest rates should drive stronger consumer spending growth and a modest recovery in investment. Real GDP growth in Japan is likely to rebound toward 1.1% driven by a gradual acceleration in real wages and consumer spending. Additionally, real GDP growth in mainland China slowing to 4.6% in 2025 as structural property sector and demographic challenges will restrain economic activity despite fiscal and monetary policy support. India should remain a bright spot, with real GDP growth expected at 6.5%, driven by public investment and strong domestic demand. Latin America is expected to see a mildly stronger expansion, despite a notable slowdown in growth in Brazil.

The emerging markets that have advantageous locations and preferential trade agreements across major blocs will grow. India, Saudi Arabia, Mexico, Brazil, the United Arab Emirates and Southeast Asian economies will benefit from maintaining or developing strong trade and investment relations across geopolitical blocs. India will continue to foster trade and investment ties across geopolitical divides while being a critical driver of South-South trade. Southeast Asia is likely to remain the top destination for foreign investment among emerging markets. In the US, protectionist measures will be used in a transactional manner to extract trade, immigration, drug traffic control, defense spending and other political concessions from trading partners. We anticipate targeted tariffs on trading partners. However, we note that a scenario factoring 60% tariffs on Chinese imports and a 10% universal tariff on all imports from other US trading partners (assuming proportional retaliation against US exports) would reduce global GDP by 1.4% after two years, with GDP in the US, mainland China, Mexico and Canada reduced by 2.0% to 3.0%.

In Europe, the European Commission will also make increasing use of trade-defensive tools such as tariffs and step up scrutiny of foreign direct investments in strategic sectors. And, in emerging countries, this trend will increasingly manifest in resource nationalism, as governments from Mexico to Indonesia seek greater state involvement in the resources sector or higher value-added process to occur domestically.

Global inflation is expected to decline steadily, to 4.2% in 2025 and to 3.5% in 2026 still somewhat higher than the 3.1% pace in 2019. In advanced economies, where inflation surged to multidecade highs following the pandemic, price pressures are expected to moderate but remain uneven. Wage cost pressures, potential tariffs and limited innovation undermining global competitiveness in some sectors are likely to persist across European economies and the UK. In the US, we expect the moderating trend in inflation will remain in place through early 2025, though it could then change as deregulation, potential immigration restrictions and tariffs lead to a renewed inflation impulse. In contrast to President-elect Trump's first term, these inflationary pressures would come in a new paradigm defined by fragile supply conditions, elevated geopolitical tensions and structural upside risks to inflation. Geopolitical tensions such as the wars in Ukraine and the Middle East could further exacerbate inflation volatility, particularly in energy and agricultural commodities.

Mainland China will face a different macroeconomic challenge: the risk of deflation due to subdued consumer spending trends, cautious business investment and ongoing deleveraging in the property sector. This has prompted authorities to announce stimulus measures to prevent exacerbating deflationary pressures. Indeed, deflation could slow the economic recovery by delaying consumer purchases, eroding corporate revenues and worsening real debt burdens, particularly if property sector weakness and slowing exports continue to weigh on private sector confidence. Emerging markets will grapple with the challenge of curbing inflation while contending with fragile supply chains, volatile commodity prices and foreign exchange fluctuations. Several Asian emerging economies, including India and Indonesia, are better positioned to maintain price stability due to proactive fiscal measures and monetary prudence. The combination of a diversified supply base that mitigates reliance on external inputs and importing deflation from China should further support disinflation.

India Macroeconomic Analysis

In India, growth is expected to decelerate to 6.5% in FY 2024 from 8.2% in FY 2023, reflecting a slowdown in investment and weak manufacturing growth. However, services activity has been steady, while growth in the agricultural sector has recovered. Private consumption growth has remained resilient, primarily driven by improved rural incomes accompanied by a recovery of agricultural output. In contrast, higher inflation and slower credit growth have curbed consumption in urban areas

Country	Real GDP Growth (CY 2023)	Estimated GDP Growth (CY 2024)	Projected GDP Growth (CY 2025)	Projected GDP Growth (CY 2026)
India	8.2%	6.5%	6.5%	6.5%
China	5.2%	4.8%	4.6%	4.5%
Russia	3.6%	3.8%	1.4%	1.2%
Brazil	3.2%	3.7%	2.2%	2.2%
United States	2.9%	2.8%	2.7%	2.1%
Japan	1.5%	-0.2%	1.1%	0.8%
Canada	1.5%	1.3%	2.0%	2.0%
France	1.1%	1.1%	0.8%	1.1%
Italy	0.7%	0.6%	0.7%	0.9%
South Africa	0.7%	0.8%	1.5%	1.6%
United Kingdom	0.3%	0.9%	1.6%	1.5%
Germany	-0.3%	-0.2%	0.3%	1.1%

Source-IMF World Economic Outlook January 2025 update.

Countries considered include - Largest Developed Economies and BRICS (Brazil, Russia, India, China, and South)

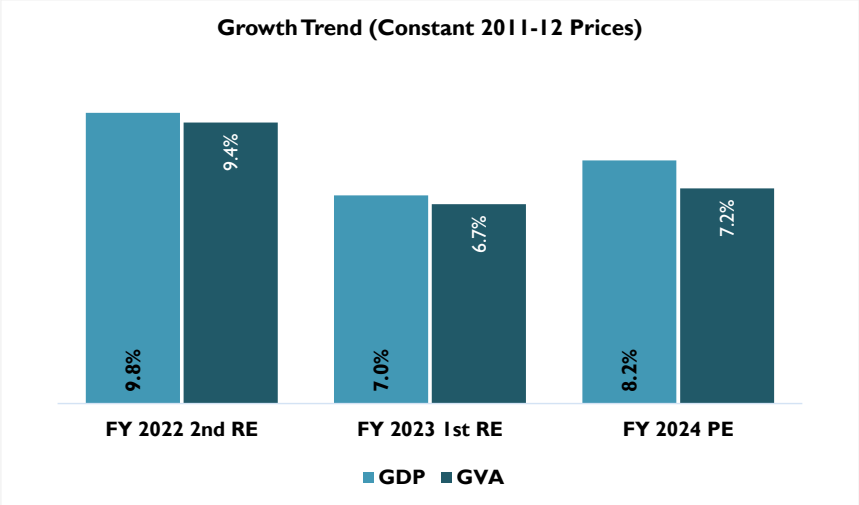
Countries have been arranged in descending order of GDP growth in 2023).

There are few factors aiding India's economic recovery – notably its resilience to external shocks and rebound in private consumption. This rebound in private consumption is bringing back the focus on improvements in domestic demand, which together with revival in export demand is a precursor to higher industrial activity. Already the capacity utilization rates in Indian manufacturing sector are recovering as industries have stepped up their production volumes. As this momentum sustains, the country may enter a new capex (capital expenditure) cycle. The universal vaccination program by the Government has played a big part in reinstating confidence among the population, in turn helped to revive private consumption.

Realizing the need to impart external stimuli, the Government stepped up its spending on infrastructure projects which in turn had a positive impact on economic growth. The capital expenditure of the central government increased by 11.1% increase in capital expenditure (budget estimates), to the tune of INR 11.11 trillion in the Union Budget 2024-2025 constituting 3.4% of the GDP. The improvement was accentuated further as the Budget 2025-2026 announced an 10% increase in capital expenditure, coupled with INR 1.5 trillion in interest-free loans to states. This has provided much-needed confidence to the private sector, and in turn, expected to attract the private investment.

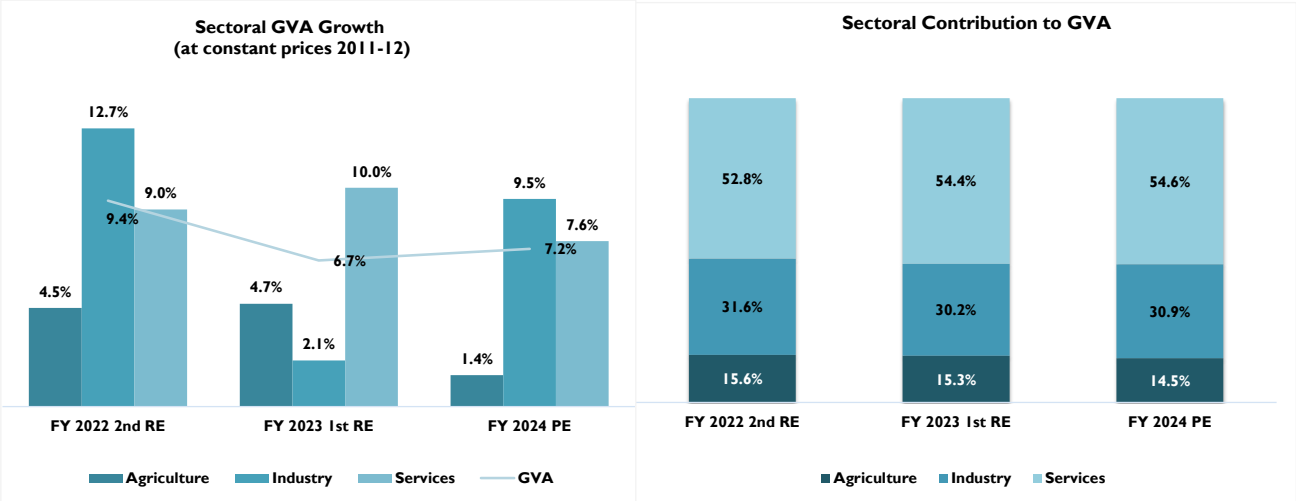
Historical GDP and GVA Growth trend

As per the provisional estimates 2023-24, India's GDP in FY 2024 grew by 8.2% compared to 7.0% in the previous fiscal on the back of solid performances in manufacturing, mining, and construction sectors. The year-on-year increase in growth rate is also partly due to by a strong growth in investment demand led by public capital expenditure.



Source: Ministry of Statistics & Programme Implementation (MOSPI), National Account Statistics, 2023-24

Sectoral Contribution to GVA and annual growth trend



Source: Ministry of Statistics & Programme Implementation (MOSPI)

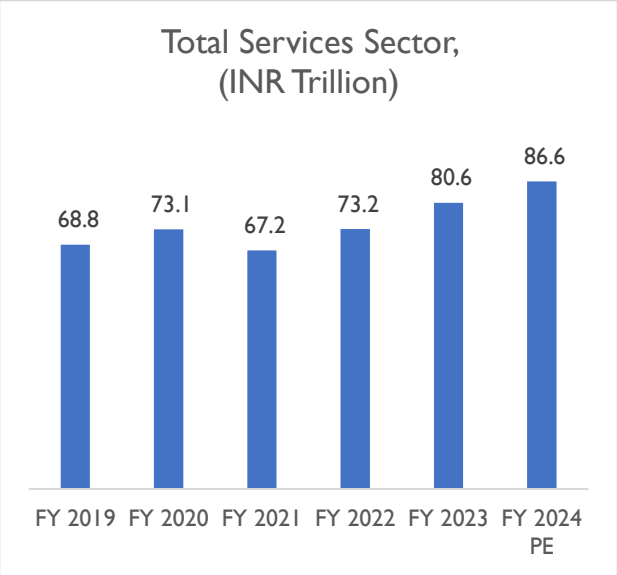
Sectoral analysis of GVA reveals industrial sector recovered sharply registering 9.5% y-o-y increase in FY 2024 against 2.1% in the previous fiscal. In the industrial sector, growth across major economic activity such as mining, manufacturing and construction sector rose significantly and it registered a growth of 7.1%, 9.9% and 9.9% in FY 2024 against a y-o-y change of 1.9%, -2.20%, and 9.44% in FY 2023, respectively. Utilities sector observed a marginal moderation in y-o-y growth to 7.5% against 9.44% in the previous years.

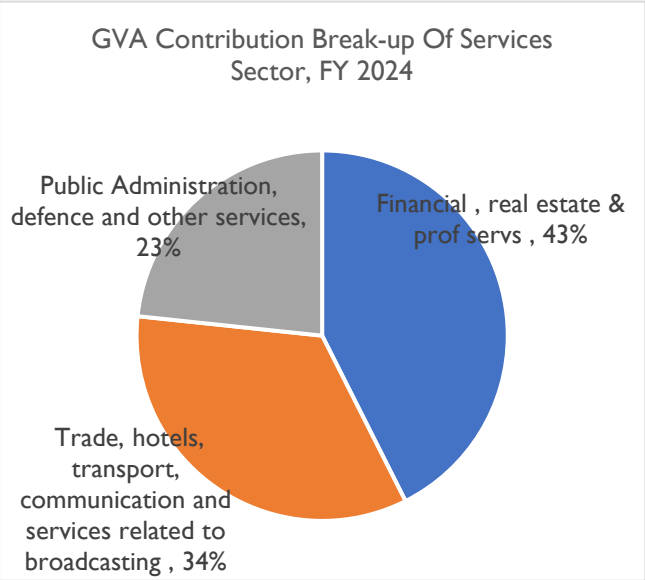
Talking about the services sector's performance, with major relaxation in covid restriction, progress on COVID-19 vaccination and living with virus attitude, business in the service sector gradually returned to normalcy in FY 2023. Economic recovery was supported by the service sector as individual mobility returned to the pre-pandemic level. The trade, hotel, transport, communication, and broadcasting segment continued to strengthen in FY 2023 and grow in FY 2024, although the growth hasn't shown substantial increases. In FY 2024, services sector grew by 7.6% against 10% y-o-y growth in the previous year.

Expansion in Service Sector

Services sector is a major contributor to the country's overall economic growth. In absolute terms, services sector GVA has increased from INR 68.78 trillion in FY 2019 to INR 86.6 trillion in FY 2024 (as per the provisional estimated), registering a CAGR of nearly 5%. Within Services sector, the GVA by financial, real estate and professional services-the largest contributing segment observed 6.3% CAGR while

Public Administration, defence and other services[1] observed 4.5% CAGR and Trade, hotels, transport, communication, and services related to broadcasting witnessed 3.1% CAGR between FY 2019-24.





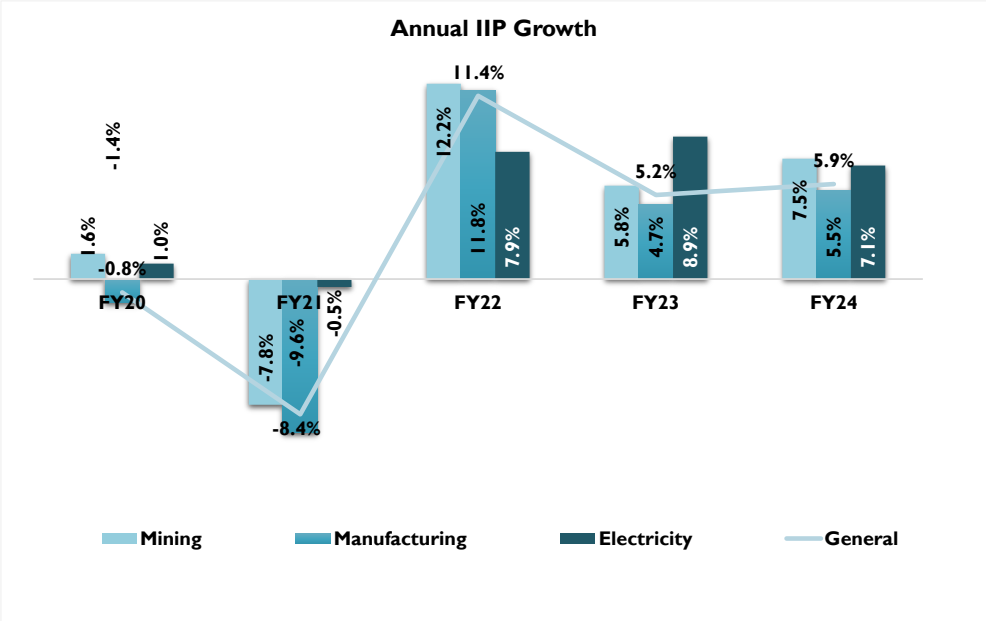
Sources: MOSPI, CMIE Economic Outlook and Dun & Bradstreet Research Estimates2F[2]

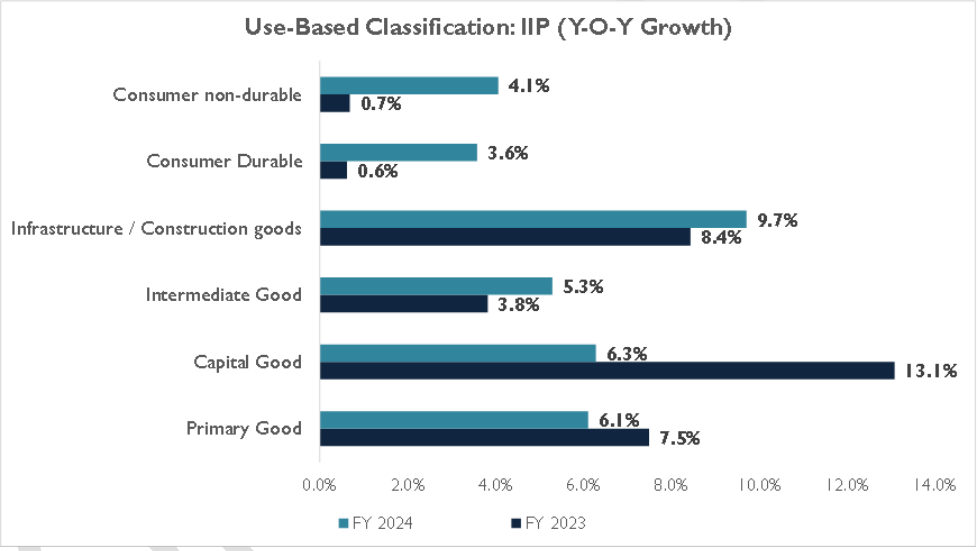
India's HSBC Services Purchasing Managers' Index**,** an important indicator to track service sector performance, measured 60.3 in July 2024 against 60.5 in the previous month. Since August 2021, the services sector has consistently remained above the threshold of 50, which distinguishes growth from contraction.

IIP Growth

Industrial sector performance as measured by IIP index; in FY 2024 it is growing at 5.9% (against 5.2% in FY 2023). Previously IIP index exhibited temporary recovery in FY 2022 from the low of Covid induced slowdown in industrial growth during FY 2020 and FY 2021. Manufacturing index, with 77.6% weightage in overall index, grew by 5.5% in FY 2024 against 4.7% y-o-y growth in FY 2023 while mining sector index too grew by 7.5% in FY 2024 against 5.8% in the previous years. Mining & manufacturing both shown improvement according to previous except the Electricity sector Index, witnessed an improvement of 7.1% in FY 2024 against 8.9% in the previous year.

[1] Other services include Education, Health, Recreation, and other personal services.
[2] Projection as Based on CMIE Growth rate till FY 2029 and FY 2030 is based on Dun & Bradstreet assumption.

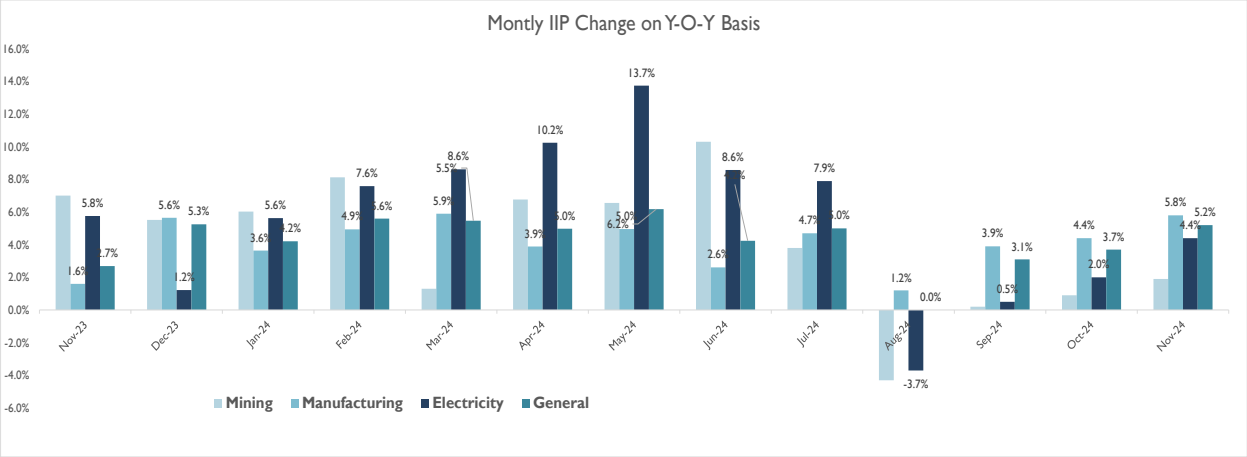




Source: Ministry of Statistics & Programme Implementation (MOSPI)

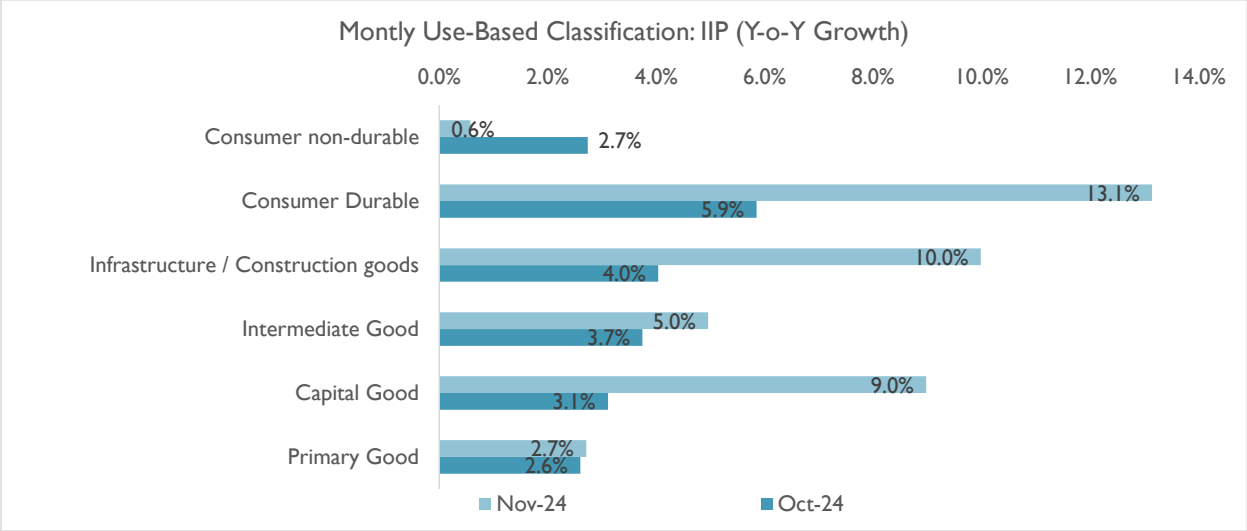
As per the use-based classification, most segments have shown growth for FY 2024 compared to FY 2023. Capital good and primary goods were segments which faced less growth as compared to previous year. The contracting IIP data points towards adverse operating business climate as global headwinds, high inflation, and monetary tightening cumulatively impacted the broader industrial sector performance. In contrast all the segments except the above two have shown growth.

Monthly IIP Growth Trend



Source: Ministry of Statistics & Programme Implementation (MOSPI)

In the current fiscal FY 2025, the monthly IIP measured index has reported steady improvement over the last fiscal. Overall IIP index grew by 5.2% in November 2024 against 2.3% y-o-y growth observed in November 2023. However, the mining sector index growth slowed to 1.9% in November 2024, against 7.0% y-o-y growth in November 2023 while the manufacturing sector index exhibited substantial improvement and they grew by 5.8% in November 2024 against 1.6% in November 2023, respectively.



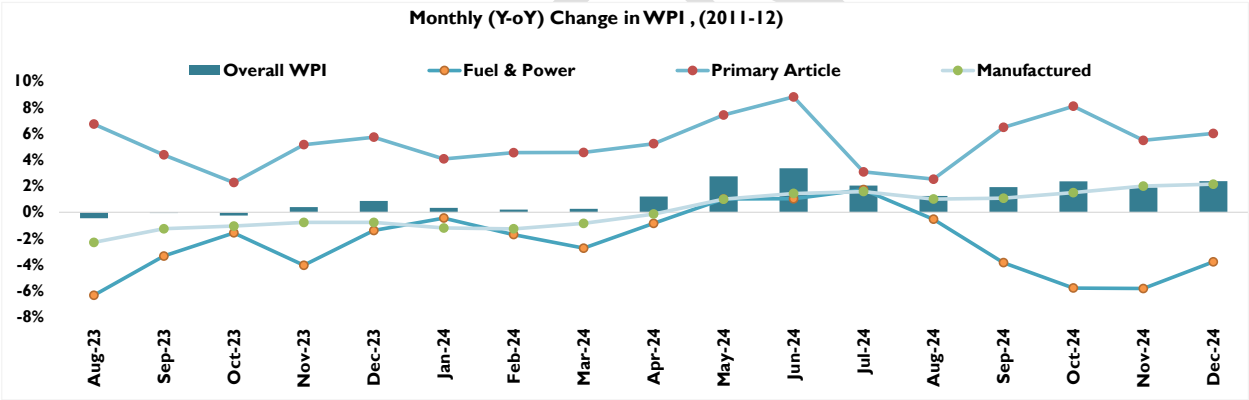
Sources: MOSPI

As per the use-based classification, growth in all segments excluding consumer non- durable increased in November 2024 as compared to the previous month. Growth in consumer non-durable segment slowed in November 2024 to 0.6% as against 2.7% in October 2024.

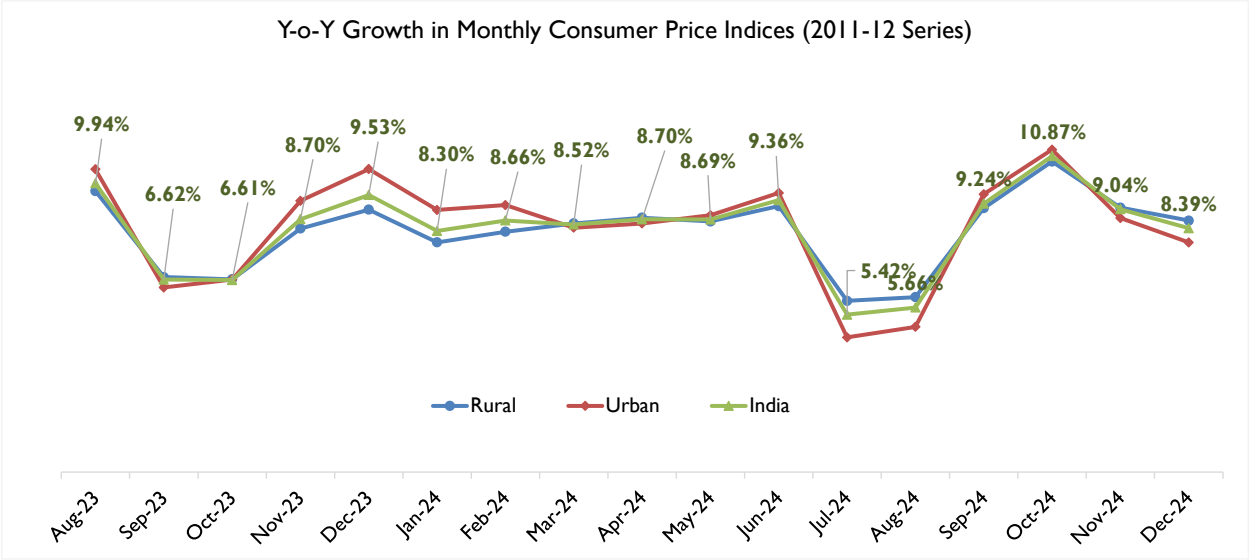
Inflation Scenario

The inflation rate based on India's Wholesale Price Index (WPI) exhibited significant fluctuations across different sectors from August 2023 to December 2024. Overall WPI number measured 2.4% in December 2024. Positive rate of inflation in December 2024 is primarily due to increase in prices of food articles, manufacture of food products, other manufacturing, manufacture of textiles and non-food articles etc. By December 2024, Primary Articles WPI inflation moderated compared to October prices level but increase marginally compared to the previous month and measured 6.0%. The Price of food articles (-3.08%) and crude petroleum & natural gas (- 2.87%) decreased in December 2024 compared to the previous month i.e. November 2024. However, the Price of non-food articles grew by 2.53% and minerals by 0.48% in December 2024 as compared to November 2024.

Moreover, power & fuel, the index for this major group increased by 1.90% to 149.9 in December 2024 from 147.1 in the month of November 2024. Price of electricity (8.81%) and coal (0.07%) increased in December 2024. The price of mineral oils (-0.06%) decreased in December 2024 as compared to November 2024.



Source: MOSPI, Office of Economic Advisor.



Source: MOSPI, Office of Economic Advisor

Retail inflation rate (as measured by the Consumer Price Index) in India showed notable fluctuations between August 2023 and December 2024. Rural CPI inflation peaked at 9.67% in August 2023, declining to 8.65 % in December 2024. Urban CPI inflation followed a similar trend, rising to 10.42% in August 2023 and then dropping to 7.90% in December 2024. Overall, the national CPI inflation rate increased to 9.94% in August 2023 but moderated to 8.39% by December 2024, indicating a gradual easing of inflationary pressures across both rural and urban areas. CPI measured above 6% tolerance limit of the central bank since July 2023. As a part of an anti-inflationary measure, the RBI has hiked the repo rate by 250 bps since May 2022 to the current 6.5% while it has been holding the rate at 6.5% since 8 Feb 2023.

Growth Outlook

India's H1 FY2024-25 GDP slowdown is cyclical, driven by credit tightening and delayed fiscal spending, but strong fundamentals should support growth in the second half of the fiscal year. Politically, the continuation of the National Democratic Alliance (NDA) government signals sustained reforms, with optimism around labour and land reforms. The government is also taking steps to control retail inflation by managing food prices and import duties. Retail inflation eased to 5.2% y/y in December, down from 5.5% in November as vegetable prices moderated following a bumper summer harvest and favorable monsoon. Still-high food prices and geopolitical tensions continue to pose risks to inflation and growth. High retail credit and rising unsecured loans signal consumption-driven borrowing, yet urban demand remains under pressure. Rural demand has shown resilience, benefitting from favorable monsoons, robust agricultural output and elevated food prices. The RBI's September economic review highlighted a contrasting trend in rural and urban consumption demand in H1 FY2024- 25, with rural demand remaining robust, while urban demand showed weakness.

On external front, the global business environment remains cautious, with geopolitical tensions, particularly in Gaza, posing potential risks to global stability. In mid-January 2025, the Indian rupee dropped below INR 86.6 USD, due to strong dollar demand from foreign banks, likely due to outflows from equities and the weakness in regional peers as the dollar strengthened. Rupee continued to face pressure due to sustained foreign fund outflows and the broad strength of the American currency in the overseas markets due to unabated dollar demand from oil importers and weak risk appetite

Looking ahead to 2025, India's projected GDP growth of 6.5% stands out as the fastest among major emerging markets, significantly outpacing China's 4.6%, and Brazil's 2.2%. This robust growth trajectory is expected to sustain at 6.5% annually from 2025 to 2026, reflecting strong economic fundamentals and continued momentum.

This decent growth momentum in near term CY 2025 is accompanied by a slowdown in inflation, as well as various other factors in the medium to long term that will support the economy. These include enhancements in physical infrastructure, advancements in digital and payment technology, improvements in the ease of doing business and a higher quality of fiscal expenditure to foster sustained growth.

On the demand side, improving employment conditions and moderating inflation are expected to stimulate household consumption. Further, the investment cycle is gaining traction, propelled by sustained government capital expenditure, increased capacity utilization and rising credit flow.

From uplifting the underprivileged to energizing the nation's infrastructure development, the Government has outlined its vision to propel India's advancement and achieve a 'Viksit Bharat' by 2047 in the interim budget announced on 1st Feb 2024. The Union Budget for FY26, which takes a balanced approach to sustaining economic momentum. With a focus on stimulating demand, driving investment and ensuring inclusive development, the budget introduces measures such as tax relief, increased infrastructure spending and incentives for manufacturing and clean energy. These initiatives aim to accelerate growth while maintaining fiscal discipline, reinforcing India’s long-term economic resilience. The expansion of tax relief i.e zero tax liability for individuals earning up to INR 12 lacs annually under the new tax regime is expected to strengthen household finances and, consequently, boost consumption.

Industry Overview: Structural Steel Industry

The primary force behind industrialization in India is the usage of metals. Steel has traditionally occupied one of the top spots among metals. Steel production and consumption are frequently seen as measures of a country's economic development because it is both a raw material and an intermediary product. Steel sector has always been at the forefront of industrial progression and that is the foundation for any economy.

India is the world's second-largest producer of crude steel after China. The domestic availability of raw materials such as iron ore and cost-effective labor has led to a rapid growth of the Indian steel sector. Consequently, the steel sector has been a major contributor to India's manufacturing & consuming output. The Indian steel industry is classified into three categories - major producers, main producers, and secondary producers. The Indian steel industry is modern, with state-of-the-art steel mills. Always strive for continuous modernization of older plants and upgrade to higher energy efficiency levels for better development.

In the previous, 10–12 years, India's steel sector has expanded significantly. Production has gained by 75% since 2008, while domestic steel needs have increased by almost 80%. Also, the capacity for producing steel has grown concurrently, and the rise has been largely organic.

The structural steel industry in India serves as a cornerstone of the nation's economic and infrastructural growth, playing a critical role across sectors like buildings, bridges, and large-scale construction. With over one lakh people employed and more than 5,000 predominantly SME fabricators, the industry boasts strong backward linkages to the steel sector. Significant technological advancements, such as automated cutting and welding, 3D modeling, and laser cutting, have enhanced efficiency, precision, and cost-effectiveness. The outlook is promising, driven by government initiatives like "Make in India," the adoption of green technologies, and Industry 4.0 integration. Additionally, the rising demand for pre-engineered buildings (PEBs) underscores the need for cost-efficient and rapid construction solutions, further propelling the industry's growth. As a dynamic and evolving sector, structural steel is poised to remain integral to India's progress.

Overview of Structural Steel Engineering

Structural steel is a high-performance construction material specifically designed for use in the construction of buildings, bridges, and various other infrastructure projects where high strength-to-weight ratio is desired. It comes in various shapes such as I-beams, angles, channels, hollow structural sections (HSS), and plates, all of which are standardized to ensure uniformity in size, shape, chemical composition, and mechanical properties.

Structural steel is renowned for its strength-to-weight ratio, making it both strong and lightweight, a crucial characteristic for supporting large structures with minimal material use. It also exhibits excellent ductility, which allows it to bend and deform under stress without breaking, making it capable of withstanding bending, stretching, and other dynamic forces during construction and use.

This versatility makes structural steel indispensable in the construction of infrastructure, commercial buildings, and industrial facilities, offering strength, durability, and flexibility across diverse applications. The widespread use of steel is driven by its exceptional resilience, corrosion resistance, and ability to withstand dynamic forces such as wind, earthquakes, and heavy loads.

Structural Steel Products and Material used for Structural Steel

Structural steel products include plates, sheets, coils, I-beams, H-beams, angles, and hollow sections. Coatings such as galvanization and epoxy or polyurethane are applied to enhance durability and corrosion resistance.

STRUCTURAL STEEL PRODUCT	TYPES	USES
Beams	I Beams, Wide Flange Beams, HP Shaped Beams	Used in constructing bridges and steel-framed buildings to provide strong structural support.
Channels	J Channels, Hat Channels, U Channels, C Channels, Hemmed Channels	Used in construction, appliances, transportation, making signposts, and installing and fabricating windows and doors.Angles
Angles		Used in framing, trims, brackets, transmission towers, bridges, reactors, vessels, warehouses, and lifting & transportation machinery.
Flats		Applied in railway parts, hand tools, auto components, tin cans, press working, office goods, engineering industries, and white goods products.

Structural steel in India involves producing and assembling steel components for construction and industrial use, following Bureau of Indian Standards (BIS) guidelines for quality and safety. Common materials include IS 2062 grades like E250 for general construction and E350 or E410 for high-strength applications.

Categories of Structural Steel

Heavy Structural Steel: These are used in large-scale infrastructure projects, such as bridges, dams, communication towers, and power plants. These structures need to withstand significant loads, environmental stress, and dynamic forces. Steel's ability to resist corrosion and handle heavy equipment loads makes it ideal for these applications.

- **Bridges:** Steel's strength allows for long spans and can support heavy traffic loads while remaining lightweight.
- **Dams and Water Infrastructure:** Steel's strength and corrosion resistance make it perfect for withstanding the immense pressure from water.
- **Power Plants:** Steel frameworks support heavy industrial machinery and provide durability against operational stresses.

Medium Structural Steel: This category includes applications like scaffolding, shutters, and partition walls in industrial, commercial, and residential buildings. These structures typically balance strength and versatility, offering stable support for moderate loads.

Light Structural Steel: Found in smaller-scale applications such as doors, windows, roofing, and furniture, light Structural Steel are often used in residential or light commercial buildings. These structures provide essential strength and security, though they are not as heavy-duty as medium or heavy Structural Steel.

Other Specialized Structural Steel: This category encompasses structures like electrical panels, steel frames for solar panels, and decorative elements. These specialized steel items provide functional and aesthetic benefits across various industries.

Steel's Role in Sustainability

Steel is one of the most sustainable materials used in construction. Due to its recyclability, over 90% of steel produced worldwide is recycled. This contributes to reducing waste and conserving natural resources. Steel's life cycle is long, and it requires minimal maintenance when properly treated, further reducing its environmental footprint.

Technologies like electric arc furnaces (EAFs) help reduce carbon emissions in steel production by recycling scrap steel instead of using raw materials. These efforts are aligned with the construction industry's growing focus on sustainability.

Steel in Seismic and Fire-Resistant Construction

Seismic Resistance: Steel's inherent ductility allows it to absorb and dissipate the energy generated by seismic forces, making it ideal for buildings in earthquake-prone areas. Innovations like seismic dampers and base isolators enhance Structural Steel' ability to resist the effects of earthquakes.

Fire Resistance: While steel has a high melting point, it can lose its strength under prolonged exposure to high temperatures. Fireproofing coatings and insulation are applied to Structural Steel to maintain their stability in case of a fire, ensuring safety and minimizing structural damage.

Advancements in Steel Design and Technology

Steel design continues to evolve with advances in fabrication and material science:

- **Tapered and Curved Steel Sections:** Innovations in forming techniques now allow engineers to create tapered and curved steel sections, enabling more complex and aesthetically pleasing structures.
- **Smart Structural Steel:** The integration of sensors into Structural Steel allows for real-time monitoring of parameters like temperature, stress, and vibrations. This "smart" steel can provide data that helps with predictive maintenance and structural health monitoring, enhancing safety and efficiency.
- **Prefabricated and Modular Steel:** Prefabrication has revolutionized the steel construction process. Steel components can be pre-engineered and fabricated in controlled environments, reducing on-site labor and construction time. This modular approach also ensures higher quality and fewer chances for error.

Role of Structural Steel Firms

Structural Steel firms are critical in the construction industry, often working as subcontractors for larger EPC (Engineering, Procurement, and Construction) companies. They are responsible for the design, fabrication, and installation of steel components that form the backbone of a structure. These firms work closely with engineers, architects, and other construction professionals to ensure that Structural Steel meets the project's safety, performance, and aesthetics specifications.

Types of Steel Used in Structural Engineering and Different Steel Grades

In structural engineering, different types of steel are used depending on the properties required for specific applications, such as strength, flexibility, corrosion resistance, and durability. Steel can be categorized into several types, each with different grades based on their chemical composition, mechanical properties, and intended use.

Type of Steel	Carbon Content	Properties	Applications
Carbon Steel	Composed of Iron and Carbon	One of the most common types, cost-effective, and easy to fabricate. Composed of iron and carbon.	Structural components in construction, automotive industry, pipelines, shipbuilding,
- Low Carbon Steel (Mild Steel)	Up to 0.3% carbon	Good ductility, weldability, and machinability. Widely used in structural engineering.	Beams, columns, structural supports, general construction.
- Medium Carbon Steel	0.3% - 0.6% carbon	Balanced strength and ductility. Higher tensile strength than low carbon steel but less ductile.	Railway tracks, machinery parts, heavy-duty structural applications.
- High Carbon Steel	0.6% - 1.0% carbon	High hardness and tensile strength, but lower ductility, making it more brittle.	Tools, cutting tools, applications requiring wear resistance.
High-Strength Low-Alloy (HSLA) Steel		Alloyed with manganese, chromium, and nickel for improved strength, toughness, and corrosion resistance.	Structural shapes, plates, bridges.
Stainless Steel	Minimum 10.5% chromium	Highly corrosion-resistant, with various alloy compositions for different properties.	Chemical plants, food processing, marine applications.
- Austenitic Stainless Steel	Contains nickel and chromium	Corrosion-resistant and non-magnetic. Widely used.	General industrial and structural applications.

- Ferritic Stainless Steel	Contains chromium and lower carbon	Magnetic, moderately resistant to corrosion.	Less corrosive environments than austenitic steel.
- Martensitic Stainless Steel	Higher carbon content	Can be heat-treated for high strength and hardness.	Applications requiring high strength, such as turbine blades, valves, and pumps.
Alloy Steel		Enhanced with elements like manganese, molybdenum, chromium, or vanadium for improved properties.	Aerospace, automotive, high-performance machinery, and some construction applications.
Tool Steel		High-carbon steel known for hardness, wear resistance, and high temperature deformation resistance.	Tool manufacturing, molds for casting, cutting tools.
Weathering Steel (Corten Steel)		Forms a stable rust-like appearance that protects against further corrosion, self-protecting.	Outdoor sculptures, architectural facades, bridges needing rustic aesthetics and corrosion resistance.

Sources: Dun & Bradstreet Desk Research

Different Steel Grades:

Steel grades refer to the classification of steel based on its chemical composition, mechanical properties, and application. Here are some common steel grades used in structural engineering:

Steel Grade	Description	Properties	Applications
ASTM A36	A commonly used carbon steel grade for structural applications.	Good weldability and formability. Commonly used for beams, plates, and structural components.	General construction, bridges, and industrial applications.
ASTM A992	A high-strength low-alloy steel designed for structural shapes.	Excellent weldability and high strength. Typically used for rolled steel sections.	Wide-flange beams and columns in buildings and bridges.

ASTM A572	A high-strength low-alloy steel with excellent weldability and high tensile strength.	Available in several grades (Grade 42, 50, 55, 60, 65) based on strength.	Structural shapes and plates for bridges, buildings, and other heavy construction projects.
ASTM A240 (Stainless Steel)	Specifies stainless steel grades for flat-rolled products.	Resistance to corrosion and staining. Good strength and durability.	Structural components exposed to aggressive environments like chemical processing plants.
EN 10025 (European Steel Grades)	A European standard for hot-rolled structural steel.	Includes several grades: S235 (mild steel), S355 (high strength), and S460 (higher strength).	Structural steel components, from bridges to large buildings.
Weathering Steel (Corten Steel)	Typically classified under ASTM A588 or ASTM A242.	Corrosion-resistant and self-protecting, eliminating the need for painting.	Outdoor structures, sculptures, and bridges where a rustic appearance and corrosion resistance are desired.

Precision Fabricated Structural Steel

Precision Fabricated Structural Steel refers to steel frameworks or components that are carefully manufactured using advanced technologies to meet the specific requirements of structural projects. These structural steel components are fabricated with high precision to ensure optimal fit, strength, and durability. The manufacturing process guarantees that each steel part adheres to stringent quality standards, which is essential for large-scale construction projects, industrial facilities, and infrastructure developments.

Key Aspects of Precision Fabricated Structural Steel

Advanced Design and Engineering

In structural steel engineering, the design and engineering phase is critical to ensuring precision and functionality. Structural steel components are meticulously designed using advanced tools like Computer-Aided Design (CAD) and Building Information Modeling (BIM). These tools enable the creation of detailed 3D models that allow engineers to identify potential issues early in the design process, improving

coordination between teams. The ability to visualize the steel components and their integration ensures that each piece fits together correctly during the assembly, preventing errors that could arise on-site.

Fabrication Process

The fabrication of Structural Steel requires high levels of precision and efficiency. CNC (Computer Numerical Control) machinery is commonly used for cutting, drilling, and shaping steel components to exact specifications. Other advanced cutting methods, such as laser cutting and water jet cutting, allow for precise and intricate cuts, minimizing material waste and speeding up the fabrication process. Welding techniques, such as MIG (Metal Inert Gas) and TIG (Tungsten Inert Gas) welding, are employed to join steel parts with utmost accuracy, ensuring that welded joints are robust and reliable.

High Precision

Precision is one of the key features of fabricated Structural Steel . Every component is produced to tight tolerances, ensuring that the parts match the design specifications exactly. This high level of accuracy ensures that the steel components fit seamlessly during the assembly phase and guarantees that the entire structure will perform as intended under various loads. This precision is crucial in large-scale construction projects, where even small deviations can compromise the integrity and stability of the structure.

Quality Control

Quality control is integral to the fabrication process of structural steel. Each steel component undergoes rigorous dimensional inspections to ensure that it meets the required specifications. Additionally, non-destructive testing (NDT) methods like ultrasonic testing and magnetic particle testing are used to detect any internal flaws or weaknesses in the material. These inspections help to ensure the structural integrity of the components and prevent any potential issues that could arise during or after assembly, ultimately contributing to the safety and reliability of the finished structure.

Surface Treatment

Steel components are often subjected to surface treatments to enhance their durability and longevity, especially when exposed to harsh environmental conditions. Common surface treatments include galvanization, powder coating, and painting. These treatments offer protection against corrosion, which can weaken the material over time. For structures in harsh climates or exposed to moisture, these protective coatings are essential to ensure the steel maintains its strength and appearance throughout its lifespan.

Assembly and Construction

Once the steel components are fabricated with precision, they are transported to the construction site for assembly. The accuracy achieved during the fabrication process ensures a smoother, faster, and more efficient construction process. Since the components fit together seamlessly, fewer adjustments are required on-site, which speeds up the construction timeline and reduces the risk of errors. The precision also ensures that the final structure is stable and meets all design specifications, contributing to the overall safety and functionality of the building or infrastructure.

Overview of Structural Steel Manufacturing Process

The process of fabricating and constructing structural steel involves several stages, each critical to ensuring the steel meets the required **strength**, **functionality**, **durability and comply with safety standards**. The following is a detailed overview of the key stages involved in the manufacturing process of structural steel:

Design and Detailing

The manufacturing process begins with the design and detailing phase. Architects and engineers work together to create detailed blueprints and specifications that define the structural steel dimensions, load-bearing capacities, and alignment with safety standards. This phase involves:

- **Architectural and Structural Plans:** These plans define the overall design and layout of the structural steel, detailing aspects like floor plans, elevation views, and load analysis.
- **Computer-Aided Design (CAD) and Building Information Modeling (BIM):** Advanced CAD software and BIM tools help create 3D models, allowing for precise visualization and detection of design inconsistencies before fabrication. These tools optimize material usage and minimize errors during the construction phase.
- **Detailed Drawings:** CAD generates detailed drawings, such as shop drawings and fabrication drawings, that provide precise dimensions, material specifications, and weld or bolt placements, guiding the entire fabrication process.

Material Procurement

Once the design is finalized, the next step is material procurement. Steel types and grades are selected based on the project's specifications, such as structural load-bearing capacity, resistance to environmental factors (e.g., corrosion resistance), and overall durability. This stage includes:

- **Material Selection:** The appropriate steel grades (e.g., carbon steel, alloy steel, stainless steel) are chosen based on their strength, flexibility, and corrosion resistance requirements for the project.
- **Supplier Coordination:** Materials are sourced from certified steel suppliers and manufacturers. Advanced software tools, like material management systems, ensure that the right materials are ordered in the correct quantities and are available on time.
- **Quality Control of Raw Materials:** Before procurement, each batch of steel is inspected for chemical composition and mechanical properties. This ensures that the material meets regulatory standards and the project's specifications.

Cutting and Shaping

The steel components are fabricated into the required shapes and sizes using advanced machinery. The cutting and shaping process typically involves:

- **Cutting Methods:** Modern CNC (Computer Numerical Control) machines, such as laser cutting, plasma cutting, and waterjet cutting, are used for precise and efficient cutting of steel into required dimensions. These technologies offer high accuracy and are capable of handling complex shapes.
- **Drilling and Notching:** Holes are drilled into the steel to allow for bolting and assembly during the structure's construction. Notches and slots are cut where required, based on the design specifications.
- **Shape Formation:** Steel plates and sections are also formed into specific shapes like beams, columns, and braces. This is done using automated machinery that allows for complex profiles to be formed with high precision.

Bending and Shaping

After the initial cutting, some steel components require bending to achieve the desired structural shape:

- **Bending Methods:** Steel is bent using specialized equipment such as press brakes or rolling machines. These processes allow the steel to be formed into curves or angular shapes to match design requirements.

- **Precision Bending:** The bending process must be highly accurate to ensure that components fit together precisely when assembled. Even slight misalignments can affect the overall structural integrity.

Welding and Assembly

Once the steel components are cut, shaped, and bent, they are assembled into larger units:

- **Welding:** Various welding techniques such as MIG (Metal Inert Gas), TIG (Tungsten Inert Gas), and stick welding are used to join steel components. The choice of welding technique depends on factors like material thickness, structural requirements, and environmental conditions. Quality of welding is critical for ensuring strong, durable joints.
- **Bolting and Fastening:** Bolting may also be used to secure steel components, particularly in large Structural Steel where fast and reliable connections are needed. Bolted joints can be more easily adjusted during assembly compared to welded joints.
- **Assembly Process:** The components are assembled in sections or sub-assemblies in the fabrication shop. These sections are then pre-assembled into larger modules that will eventually be assembled on-site. In some cases, complex structural elements are prefabricated in the shop and only require minimal adjustments on-site.

Quality Control and Inspection

Throughout the fabrication process, stringent quality control (QC) measures are followed to ensure that every component meets the specified standards:

- **Dimensional Inspections:** The dimensions of the fabricated steel components are carefully checked to ensure accuracy. Any discrepancies in size or shape can lead to issues during assembly or structural instability.
- **Weld Testing:** Non-destructive testing (NDT) methods like ultrasonic testing, magnetic particle testing, or X-ray inspections are performed to assess the quality of welds. These methods detect any hidden defects or weaknesses in the joints.
- **Material Testing:** Steel samples are tested for strength, hardness, and other mechanical properties to verify that they meet the requirements outlined in the design and material specifications.

- **Compliance with Codes:** All components must comply with relevant building codes and regulations, such as those outlined by the American Institute of Steel Construction (AISC) or the International Building Code (IBC).

Surface Treatment and Finishing

To ensure the longevity and durability of the structural steel, surface treatments are applied to protect against environmental factors such as corrosion:

- **Surface Cleaning:** Techniques such as sandblasting, shot blasting, or chemical cleaning are used to remove impurities and prepare the steel surface for coating.
- **Coating Methods:** Steel components are coated with protective finishes like galvanization (zinc coating), epoxy coatings, or paint. These coatings provide a layer of protection against rust, corrosion, and weathering, especially for structures exposed to outdoor environments or harsh chemicals.
- **Aesthetic Finishing:** For architectural or visible parts of the structure, decorative finishes may be applied to improve the visual appeal of the steel. This could include powder coating or custom paint finishes.

Transportation and Installation

Once fabrication and finishing are completed, the steel components are ready to be transported to the construction site. The logistics of this process are complex:

- **Transportation:** Steel components are carefully packed and shipped to the construction site, often requiring special transport vehicles to accommodate large and heavy loads. Components may be delivered in sections for easier handling.
- **Installation on Site:** On-site installation typically involves cranes and other lifting equipment to position the steel elements accurately. Assembly is carried out according to the design, with each component being bolted, welded, or fitted together as per the blueprints.
- **Safety and Coordination:** Installation requires careful planning and coordination, as the steel components need to be handled safely and efficiently. The installation crew works closely with engineers to ensure that the structure is erected in a controlled manner, reducing the risks associated with lifting and positioning heavy steel parts.

Software Tools and Technology Integration

Throughout the entire steel manufacturing and construction process, various software tools play a vital role in ensuring efficiency, precision, and coordination:

- **3D BIM (Building Information Modeling):** BIM tools, like Autodesk's AEC Collection, allow for the creation of detailed 3D models that streamline the design, fabrication, and installation processes. These models help detect potential issues early on, optimize material usage, and reduce errors during construction.
- **CNC Machine Integration:** Software like MSUITE and ConstruSteel integrates directly with CNC machines for efficient control and precise fabrication. These tools enable automated cutting, drilling, and shaping of steel components, reducing human error and enhancing productivity.
- **Digital Task Management:** Software platforms help manage workflow, scheduling, and material tracking, allowing the project team to stay on top of timelines and ensure that each phase of the process progresses smoothly.

Key Segments for the Structural Steel Industry

Structural steel is a versatile material used across various industries due to its strength, durability, and adaptability. Its ability to withstand extreme conditions, support heavy loads, and offer design flexibility makes it an essential material in wide range of applications. Based on its application it is segmented into structural steel for:

- **Building Construction:** Structural Steel are used for high-rise buildings, commercial spaces, and residential units. Steel offers the flexibility to create complex designs while providing the necessary strength to support multi-story buildings.
- **Infrastructure Construction:** Bridges, dams, and transportation infrastructure rely heavily on steel due to its ability to withstand heavy loads and dynamic forces like traffic, wind, and seismic activity.
- **Industrial Construction:** Steel is used in the construction of warehouses, factories, and power plants, where strength and durability are essential for supporting large machinery and heavy loads.

Key Applications for Structural Steel in Major Industries

The structural steel industry in India is a crucial part of infrastructure and industrial development. As urbanization, industrialization, and technological advancements progress, the demand for high-

performance Structural Steel continues to grow. Below is a detailed overview of the key applications for structural steel:

Construction Industry

The construction sector is the largest consumer of structural steel, covering residential, commercial, and large-scale infrastructure projects. Steel is used in high-rise buildings, metro rail networks, bridges, airport terminals, and prefabricated structures. The growing emphasis on green building practices and sustainable materials has also contributed to the demand for structural steel in eco-friendly projects.

- **Commercial Buildings**

  Structural steel plays a pivotal role in the construction of commercial buildings such as office complexes, retail centers, and high-rise skyscrapers. Steel's high strength-to-weight ratio allows for the efficient design of load-bearing frameworks, enabling the construction of taller, more resilient structures. Additionally, steel's durability makes it a suitable material for buildings requiring resistance to seismic activity and high wind loads. Its ability to support innovative architectural designs, including glass facades and open-floor concepts, makes it a preferred choice for commercial developments.

- **Residential Buildings**

  In residential construction, structural steel is used for framing, supporting foundations, and creating open floor plans in homes and multi-family units like apartments. Steel provides flexibility in design, enabling the construction of large, open spaces without the need for excessive interior columns or walls. It is also resistant to environmental factors such as termites, rot, and extreme weather conditions, ensuring the longevity and strength of the structure. Steel framing is particularly beneficial in areas prone to natural disasters like earthquakes or hurricanes, where structural integrity is critical for occupant safety. Prefabricated steel components also allow for faster and more cost-effective construction.

- **Bridges**

  Steel is a critical material in the construction of bridges due to its high tensile strength and ability to span long distances. Whether for highways, railways, or pedestrian footbridges, steel bridges can withstand heavy loads and harsh weather conditions, providing both functionality and safety. Steel allows for lighter, more efficient designs that require fewer supports, making it ideal for longer spans and more complex bridge constructions. Additionally, steel's resistance to corrosion is vital for bridges exposed to the elements, especially in coastal or industrial regions where

moisture, salt, and pollutants can accelerate material degradation. Advanced protective coatings and galvanization further enhance steel's durability in bridge construction.

- **Transportation Infrastructure**

  Steel is critical in the development of transportation infrastructure, including airports, railway stations, tunnels, and metro systems. Its ability to provide large, open spaces with minimal internal supports makes it ideal for large terminals, hangars, and transit hubs. Steel also provides the strength necessary to support bridges, overpasses, rail lines, and multi-level parking structures, contributing to the durability, safety, and longevity of transportation networks. In underground applications, steel-reinforced tunnel linings improve stability and resistance to geological pressures.

- **Sports Stadiums and Arenas**

  Steel's ability to create large, open spaces is particularly useful in the construction of sports stadiums and arenas. Structural steel is used in the framework of expansive roof structures, allowing for wide spans without the need for internal columns that could obstruct views or seating arrangements. Its durability and ability to handle high loads make it the ideal material for supporting seating areas, scoreboards, lighting systems, and retractable roof structures. The flexibility of steel construction also enables the integration of modern, dynamic designs that enhance spectator comfort and safety, while also allowing for easy expansion or modification of existing stadiums.

Shipbuilding

In the shipbuilding industry, structural steel forms the primary framework of ships, submarines, and other marine vessels. It is used to construct the hull, deck structures, and internal support frameworks, providing the strength necessary to withstand harsh marine environments. Steel's corrosion resistance is particularly important in shipbuilding, as it ensures that vessels remain durable and safe even when exposed to saltwater, humidity, and extreme weather conditions. Specialized marine-grade steel with added corrosion-resistant properties is commonly used to improve longevity and performance.

Manufacturing Sector and Industrial Facilities

The manufacturing sector is one of the largest consumers of structural steel, driven by increased automation, foreign investments, and industrial expansion. Steel is used extensively in the construction of factories, manufacturing plants, industrial sheds, machinery frames, and equipment support structures, warehouses, and distribution centers. Structural Steel are also used to construct industrial pipelines,

storage tanks, and processing units for industries such as petroleum, chemicals, and food processing. Its fire resistance, durability, and adaptability make it the preferred choice for industrial applications requiring reliability and long-term performance. Structural Steel can also be quickly assembled and modified, ensuring flexibility for evolving industrial needs. The rise of smart factories and Industry 4.0 technologies has further increased the demand for precision-engineered steel frameworks in automated production plants.

Energy and Power Plants

Steel plays a fundamental role in the construction of power generation plants, including coal, gas, nuclear, and renewable energy facilities. It is used in the fabrication of supporting structures, cooling towers, pressure vessels, and transmission towers. Steel's ability to withstand extreme temperatures, pressures, and mechanical stress makes it suitable for demanding applications in energy production. Wind turbine towers, hydroelectric dams, and solar panel mounting systems are also heavily dependent on steel due to its superior load-bearing capacity and adaptability. As India moves towards sustainable energy solutions, the need for high-quality steel components in energy infrastructure is increasing.

Military and Defense Applications

Structural steel is extensively used in military and defense infrastructure, including bunkers, hangars, naval bases, aircraft carriers, armored vehicles, and missile silos. Steel's high impact resistance and ability to be reinforced make it ideal for protective structures designed to withstand explosions, ballistics, and extreme conditions. Military-grade steel is engineered to offer enhanced durability, blast resistance, and corrosion protection, ensuring mission readiness in diverse operational environments.

Mining and Heavy Equipment Structures

Steel plays a crucial role in the mining industry, where it is used in the construction of mining equipment, structural supports, and processing plants. Structural Steel such as conveyors, crushers, loaders, and storage silos are essential for handling raw materials. Steel's toughness and ability to resist abrasion and impact make it well-suited for mining operations, which involve heavy loads and harsh working conditions.

Prefabricated and Modular Construction

Structural steel is widely used in prefabricated and modular construction, where components such as steel beams, columns, and trusses are manufactured off-site and then assembled on location. This approach

significantly reduces construction time, labor costs, and material waste while maintaining high standards of quality and precision. Prefabricated steel buildings are commonly used for commercial, industrial, and emergency response structures, offering rapid deployment and reusability.

Oil & Gas Industry

The oil and gas sector requires high-strength, corrosion-resistant steel for offshore rigs, refineries, storage tanks, and pipeline infrastructure. Steel is crucial for deep-sea drilling platforms, petrochemical plants, and LNG terminals, ensuring durability and safety under extreme operating conditions.

Logistics

Structural steel is widely used in port terminals, multi-level parking facilities, and transportation hubs. With ongoing investments in dedicated freight corridors, high-speed rail projects, and metro expansion, Structural Steel are essential for safe and efficient logistics infrastructure.

Warehousing and E-Commerce

The rapid growth of e-commerce and logistics has led to increased demand for warehousing and distribution centers. Steel is commonly used in pre-engineered buildings (PEBs), cold storage facilities, high-bay racking systems, and automated storage solutions. As India becomes a global logistics hub, the need for lightweight, high-strength Structural Steel continues to grow.

Defense and Aerospace

In the defense and aerospace sectors, steel is used for naval warships, submarines, military bunkers, missile launch platforms, and aircraft hangars. Ballistic-grade steel provides additional protection for defense infrastructure, ensuring resilience in extreme conditions.

Technological Structural Steel:

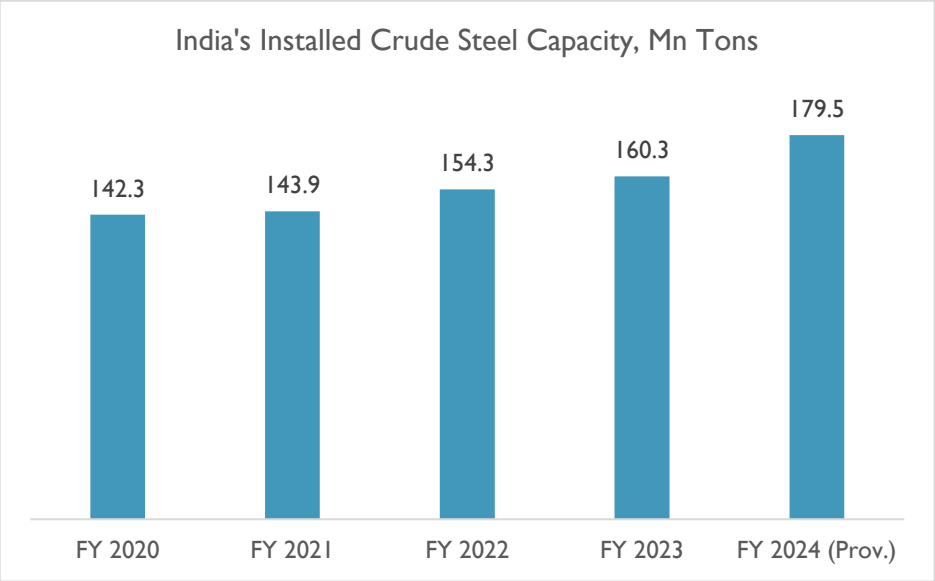
Technological structural steel refers to advanced steel materials and fabrication techniques used in the construction and engineering industries to create more efficient, durable, and innovative structural elements. It incorporates high-performance steel alloys and cutting-edge technologies, such as computer-aided design (CAD), automation, and advanced welding methods, to improve the precision, strength, and sustainability of Structural Steel . This type of steel is engineered to meet specific technological requirements, including higher resistance to environmental factors, increased load-bearing capacity, and greater flexibility in design. Structural steel is often employed in modern infrastructure projects, industrial

facilities, and large-scale architectural designs, contributing to safer, more cost-effective, and energy-efficient buildings and structures.

Sectors	Application Area
Industrial Machinery & Heavy Equipment	Technological Structural Steel reinforce manufacturing plants, supporting cranes, conveyor belts, automated robotic systems, and heavy industrial machinery. These structures ensure load-bearing efficiency, durability, and vibration resistance in high-impact environments. Production lines, machinery, and other essential equipment in factories.
Storage Tanks and Pressure Vessels	Structural Steel are used in oil and gas storage tanks, cryogenic tanks, water reservoirs, and chemical processing plants. Their ability to withstand high pressure, temperature variations, and corrosion makes them essential for industrial storage solutions.
Energy Production & Renewable Energy Structures	Power Plant(for housing turbines, reactors, or cooling towers). The renewable energy sector uses steel in wind turbine towers, solar farm structures, and battery storage enclosures. As India invests in clean energy projects, the demand for structural steel in green infrastructure continues to rise.
Infrastructure:	Bridges, tunnels, and highways, where heavy machinery or transportation systems are involved.
Smart City and Telecom Infrastructure	As India develops smart cities and 5G networks, steel is used in telecommunication towers, urban transit hubs, and modular housing solutions. Steel's lightweight yet durable properties make it an ideal material for prefabricated urban infrastructure. Steel towers and masts to support antennas and communication equipment
Warehouses Facilities	Steel frameworks to create large, open spaces for organizing and storing goodss
Automotive Industry:	Structural Steel for vehicle manufacturing plants, as well as in testing and research facilities.
Agricultural	Structural Steel for grain silos, greenhouses, and other agricultural systems that require strong and durable frameworks.

Overview of the Overall Steel Sector in India

India, the second-largest crude steel producer, has also been a key player in the global steel market. The country leverages its rich iron ore reserves and supportive government initiatives, such as the National Steel Policy 2017, to enhance its production capabilities. India's crude steel production capacity has increased from 142.3 Mn tonnes in FY 2020 to 179.5 Mn Tonnes in FY 2024 (provision as per Ministry of Steel), registering a compounded annual growth of 6%.



Sources: CMIE Industry Outlook, Ministry of Steel

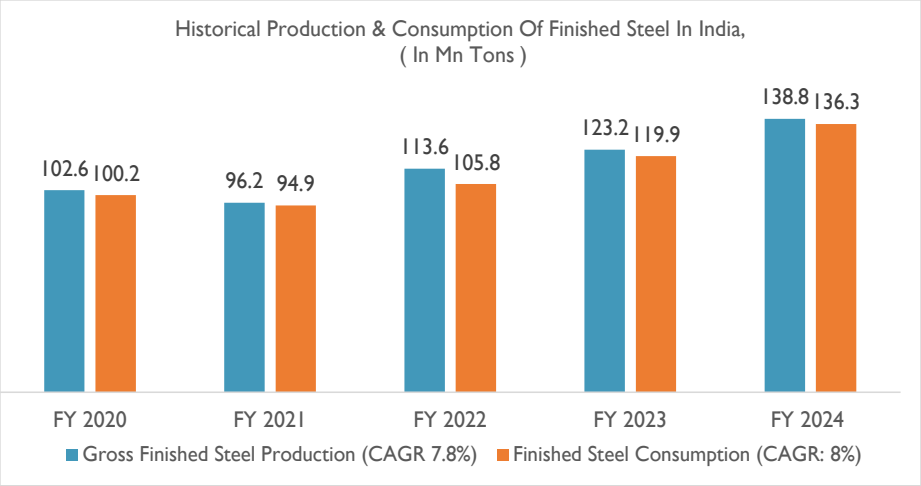
Historical Production & Consumption of Finished Steel in India

Production: India's production of finished steel stood at 139.4 million tonnes in FY 2024, marking a 12.7% increase over FY 2023. The private sector played a dominant role in this growth, contributing 85% (118.31 million tons) and witnessing a 13.5% rise in production, compared to an 8.4% increase from the public sector units (PSUs), which accounted for 15% of the total production.

Non-flat products, which include long steel used primarily in construction, comprised 55% of the total output, growing by 13.8%, while flat products, used in automotive and appliance manufacturing, made up the remaining 45%, increasing by 11.3%.

Several factors have driven the increase in crude steel production. The surge in demand from construction and infrastructure projects, fueled by government initiatives like 'Make in India' and the National Infrastructure Pipeline, has significantly boosted production. The automotive sector's recovery and expansion also played a critical role. Furthermore, technological advancements and modernization of steel manufacturing processes have improved efficiency and output. Investments in expanding steel

plant capacities, alongside a focus on sustainable practices such as the use of scrap steel and energy-efficient technologies, have enhanced production capabilities. Additionally, the global market's growing appetite for steel has spurred Indian producers to increase their output to meet both domestic and international demands. The favorable economic environment and strategic policy support have thus cemented India's position as a leading crude steel producer on the global stage.



Sources: CMIE Industry Outlook, Ministry of Steel

Consumption Growth

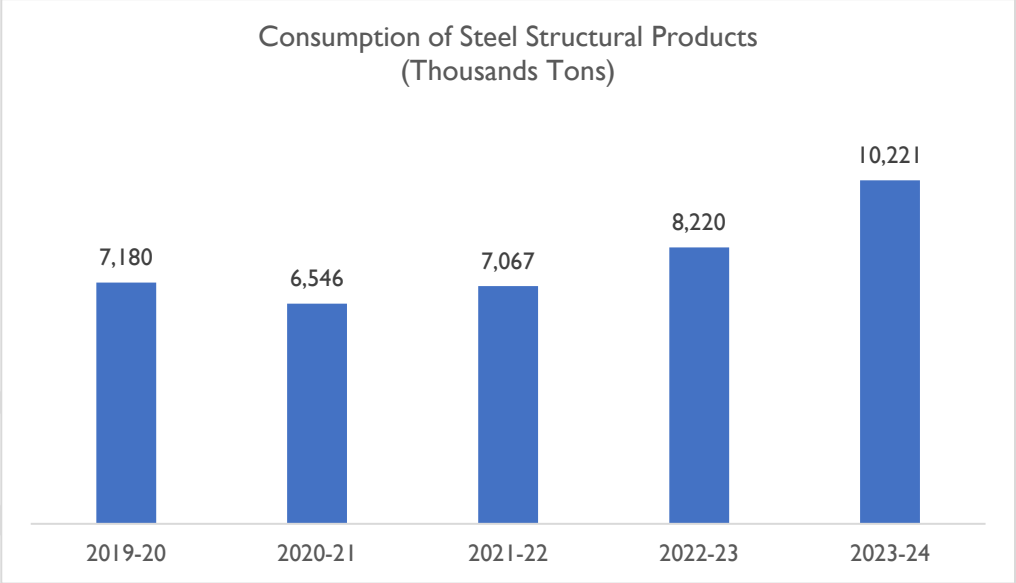
India's booming economy, with growing demand from sectors like construction, automobile manufacturing, and white goods production, further fuels its steel industry. The government's focus on infrastructure development and the 'Make in India' initiative has also contributed to increased domestic steel consumption.

Analyzing the trends in crude steel consumption over recent fiscal years reveals a pattern marked by fluctuations influenced by global economic shifts and industrial trends. Until FY2020, there was a consistent increase in crude finished consumption. However, the arrival of the COVID-19 pandemic in 2020 led to a significant downturn, with consumption dropping by 5% in FY 2021. This decline was mainly driven by the disruptions caused by the pandemic, including widespread lockdowns, supply chain interruptions, and decreased economic activity across key sectors. Despite these challenges, the steel industry recovered swiftly from the pandemic-induced slump. In the subsequent recovery phase from FY 2022 to FY 2024, there was a notable resurgence in consumption, with a robust average growth rate of 13%. This rebound was fueled by various factors, including increased investments in global infrastructure projects, the revival of the automotive and construction sectors post-pandemic, and the expansion of industrial sectors like machinery and equipment manufacturing. Additionally, governments

worldwide implemented supportive policies and incentives to revitalize manufacturing and construction, further driving the steel demand. In FY 2024, the industry witnessed 14%, yearly growth against 13% in the previous fiscal. Overall, these dynamics highlight the complex relationship between crude steel consumption patterns and broader economic trends, showcasing the industry's ability to adapt and innovate amidst challenges while paving the way for continued growth.

Current Scenario: Structural Steel in India[3]

The India Structural Steel Fabrication Market is expected to experience a steady growth driven by several key factors, including increasing demand from the manufacturing sector, the rise in preference for pre-engineered buildings (PEB), and strong government initiatives focused on infrastructure development. The manufacturing sector's boom has created a steady demand for structural steel, while the growing adoption of pre-engineered buildings—due to their cost efficiency, reduced construction time, and environmental benefits—has further bolstered the market. Additionally, government programs such as Make in India, smart cities, Production-Linked Incentive (PLI) Scheme, and green building initiatives are expected to provide substantial growth opportunities.



Sources: CMIE Industry Outlook, Ministry of Steel

The consumption of steel structures has rebounded in the post-pandemic period after witnessing a decline of 9% in FY 2021. This dip can be attributed to the economic challenges brought on by the COVID-19 pandemic, which affected industrial production and demand across various sectors. From FY 2022

[3] **Steel Structural** which is composed of structural steel elements such as beams, columns, and trusses, connected by welding, bolting, or riveting is a framework or assembly of steel components that form the skeleton of a construction. Its consumption is used as a proxy to reflect the market growth of structural steel consumption.

onwards, steel structural consumption has steadily increased from 7,067 thousand tonnes to 10,221 thousand tons in FY 2024, signaling a recovery in industrial activities. The most significant growth occurred in 2023-24, where consumption surged to 10,221 thousand tonnes recording 24% y-oy increase in FY 2024 against 16% and 8% growth in the previous two years, respectively. This data indicates a clear upward trend in the consumption of structural steel aligning with the country's ongoing infrastructure development and industrial expansion initiatives and driving the demand for structural steel industry in India.

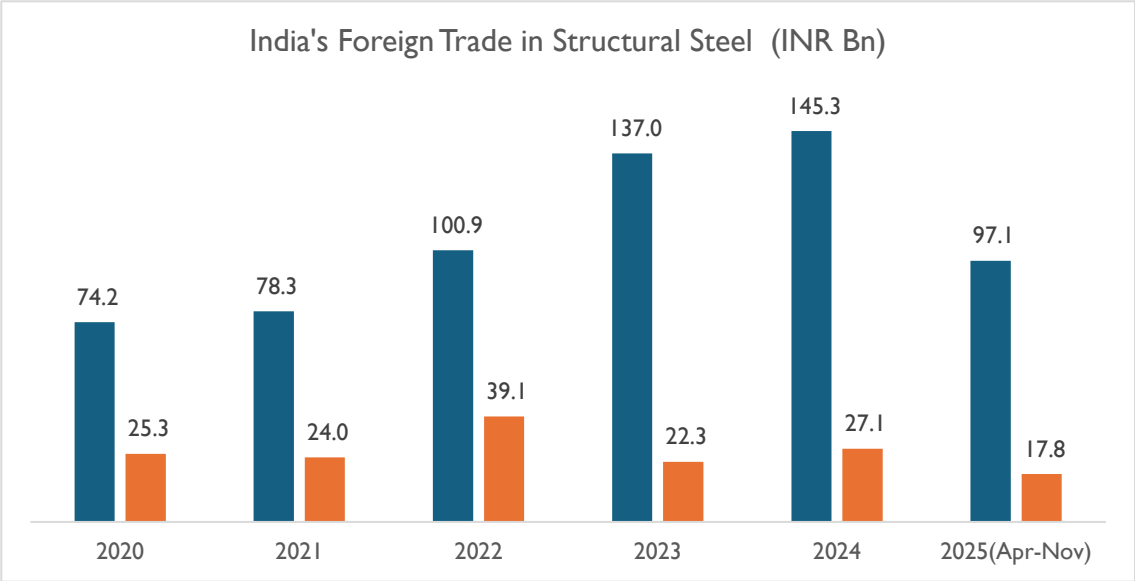
However, the market faces challenges, particularly with rising steel prices, driven by the increase in coking coal costs, and stringent environmental regulations on steel manufacturing. Despite these challenges, the increasing demand for green buildings and sustainable construction methods, where PEBs are gaining popularity due to their recyclability and lower environmental impact, offers significant opportunities for growth. On supply side, the National Steel Policy (NSP) of 2017 aims to promote the development of India's steel industry, contributing to market growth by enhancing steel production quality and capacity. Furthermore, eastern India is set to play a key role in steel production, with projected capacity increases by 2030, which will also fuel the market. Technological advancements in Structural Steel and sustainability measures are helping improve product quality and reduce emissions.

In conclusion, while challenges like raw material price fluctuations and regulatory pressures may impact the market, the overall outlook for the India structural steel fabrication market remains positive, with strong growth driven by the manufacturing sector, government initiatives, and the rising demand for pre-engineered, sustainable building solutions.

Foreign Trade

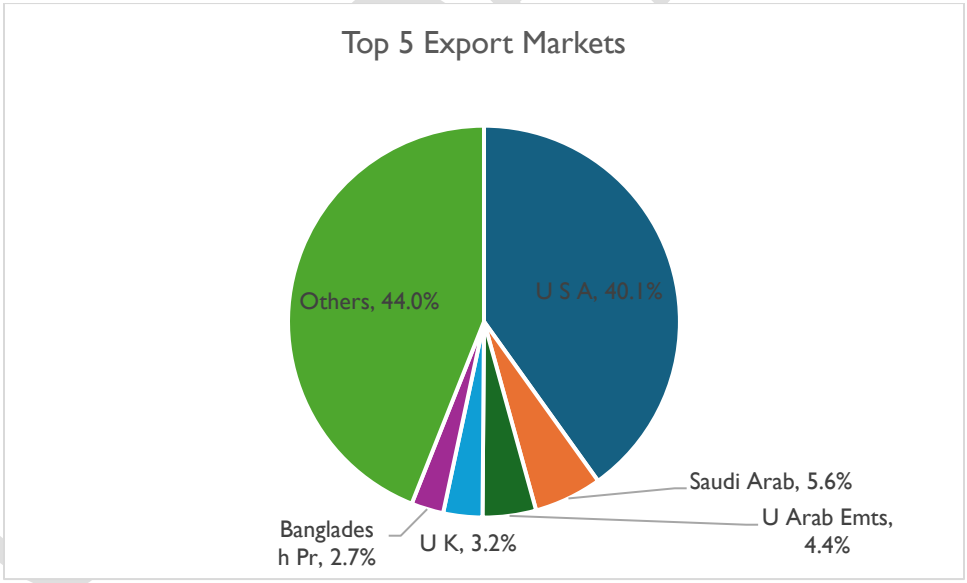
India remained a net exporter of Structural Steel while both export and import recorded a growth in FY 2024.[4] Annual exports were INR 145.3 Bn in FY 2024. For 9M FY 2025, its export amounted INR 97.1 Bn. India's export of considered product has increased at CAGR of 18.3% between FY 2020-24 while in FY 2024 it registered annual 6.1% against 35.7% y-o-y growth. On import side, he total value of considered product imported to India increased to INR 27.1 billion in FY 2024. Actual import during 9M FY 2025 stood at INR 17.8 Bn. The value of imports increased at a CAGR of 2% during the given period.

[4] HS Code 7308: Structures (Excl Prefabrictd Bldngs Of Hdg No.9406) And Parts E.G.Bridges Roofs Doors Tubes Etc Used In Structrs Of Iron.

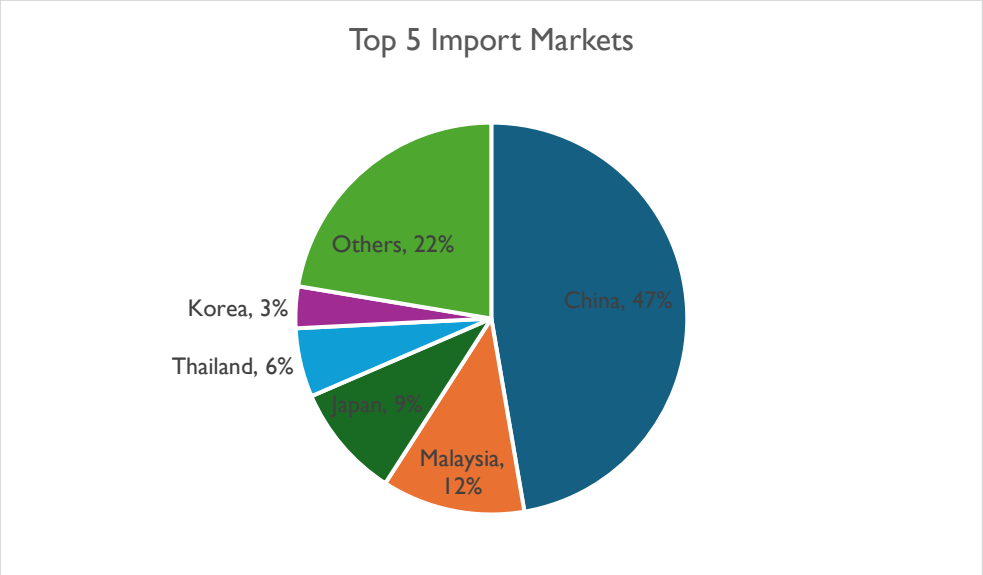


Source: Ministry of Commerce

Nearly 56% of total export in FY 2024 came from five countries: USA, Saudi Arabia, UAE, UK and Bangladesh. USA emerged as India's the largest export market, accounting for nearly 40% of total value of export of the product during FY 2024.



Source: Ministry of Commerce



Source: Ministry of Commerce

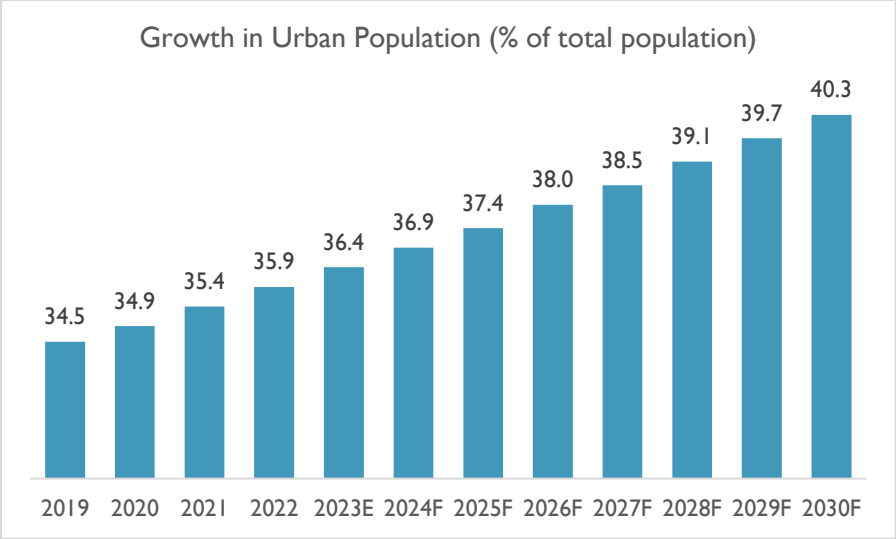
Approximately 78% of imports stemmed from the top 5 countries namely, China, Malaysia, Japan, Thailand and Korea. Other countries exporting the product to India accounted for 22% of the remaining share.

Demand Drivers

Demand for structural steel products is directly influenced by the growth in the construction sector, the largest end use sector of the product which is supported by the population growth and urbanization and government spending and policy initiative.

Increasing Urbanization

As per the handbook of urban statistics 2022, India's urban population has been on a steady rise, with urban dwellers accounting for over 469 million in 2021, is projected to soar to over 558 million by 2031 and further exceed to 600 million by 2036.



Source: World Bank,3 D&B Research and Estimates

The share of urban population in total population has been quickly escalating. In 2019, 34.5% of the total population was urban. By 2023, this is estimated to have reached to 36.4%, showing an increment of 2.1% in a span of four years. The share of urban population is further forecasted to cross 40% by 2030. This increase in urban population is set to demand drastic changes in infrastructure development. Cities are a major driver for the construction industry. With cities expanding rapidly, there will be an increased need for improved housing, water supply, sewage systems, and electricity. Urban planning will need to account for higher population densities, necessitating the development of smart cities with integrated technology for efficient management of resources and services. The Smart Cities Mission targeted at 100 cities is aimed at improving the quality of life through modernized/ technology driven urban planning. This transformation will also require significant investment in public health, education, and recreational facilities to enhance the quality of urban living. The surge in urban population will also propel demand for improvement in multimodal transport infrastructure for freight and passenger travel requirement.

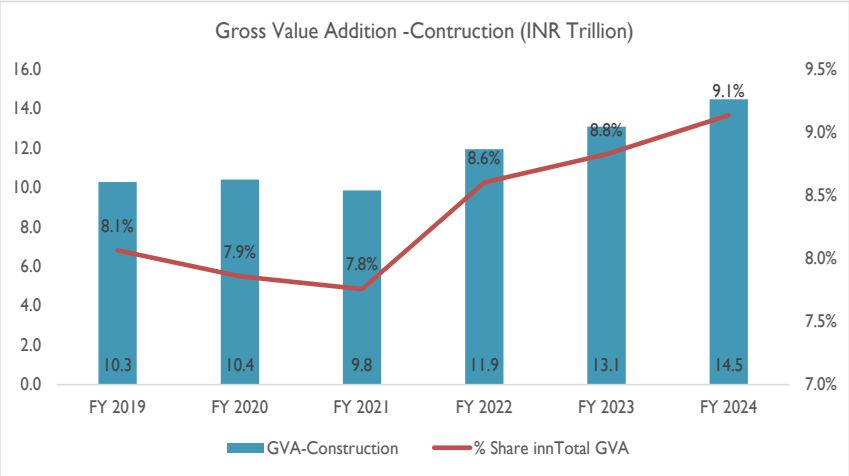
Rising Construction Activity

The construction sector uses structural steel in several products due to its strength, durability, tensile strength, and low cost. In the construction sector, structural steel products are used in industrial construction, infrastructure construction as well as building construction. The quantity of structural steel products used in building construction (residential & commercial) is quite small compared to industrial and infrastructure construction consumption. A brief performance review of Indian construction sector demand scenario is presented below:

The construction sector is a key component of the Indian economy with linkages across more than 250+ sub sectors. Construction, the second largest economic activity in India (after agriculture) contributes

around ~9.1% to the national GDP. Further, India is poised to become the third largest construction market in the next 2-3 years on the back of stable economic growth.

The construction sector's contribution to the national economy has steadily improved over the years. By FY 2024, it is estimated to account for nearly 9.1% of the national Gross Value Added (GVA). In actual terms, the GVA by the construction sector reached approximately INR 14.5 trillion in FY 2024.



Source: Ministry of Statistics & Programme Implementation (base year 2011-12)

As per National Account Statistics 2024, the output value of construction sector grew at 6.7% CAGR between FY 2018-23 while in term of contribution, other building and structures accounts which include non-residential building, road and bridges and institutional construction account for majority share contributing 82% of the total output value in FY 2023 and residential construction accounted for remaining 18% share.

Various Segment of the Construction Sector (INR Bn)	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**CAGR**
Dwellings, Other Buildings & Structures	**25,871**	**27,987**	**28,661**	**27,373**	**33,052**	**36,434**	7%
1.1 Residential (Dwellings)	**5,112**	**5,833**	**5,565**	**5,189**	**5,789**	**6,476**	5%
1.2 Other Buildings & Structures	**20,759**	**22,154**	**23,096**	**22,185**	**27,263**	**29,959**	8%
1.2.a. Non-Residential Buildings	*11,045*	*11,956*	*11,435*	*10,939*	*14,938*	*15,608*	7%
1.2 b. Roads & Bridges	*2,014*	*1,991*	*2,267*	*2,227*	*2,299*	*2,586*	5%
1.2 c. Other Structures & Land Improvements	*7,701*	*8,207*	*9,394*	*9,018*	*10,025*	*11,765*	9%
Total Output of Construction sector	**26,477**	**28,433**	**29,050**	**27,654**	**33,310**	**36,621**	6.7%

% share of Dwellings, Other Buildings & Structures in total construction output	98%	98%	99%	99%	99%	99%	-
Total GVA of Construction Sector	9,643	10,268	10,434	9,954	11,935	13,063	6.3%
Construction GVA as a % of Construction Output	36.4%	36.1%	35.9%	36.0%	35.8%	35.7%	-

Sources: National Account Statistics 2024 by MOSPI, Mineral Exploration & Plantation output has not been represented in this table as a line item while the total output value and GVA includes the same.

Increasing construction output is based on increased government spending on infrastructure. The government has identified infrastructure as a priority sector to bolster GDP growth. Various reforms have been introduced from time to time to attract investment in infrastructure. Infrastructure sector was opened to private participation post-liberalization in 1991 and currently up to 100% FDI under automatic route is allowed in most sectors/activities. Under this route, no permission from the Central Government is required for FDI inflow, but the same is subject to applicable laws/regulations, security and other conditions. However, participation was low due to high upfront capital investment, long gestation period, and uncertain returns in investment. Public Private Partnership (PPP) project mode was introduced to circumvent this hurdle.

Also, 100% FDI under automatic route is allowed in construction-development projects which would include development of townships, construction of residential/commercial premises, roads or bridges, hotels, resorts, hospitals, educational institutions, recreational facilities, city and regional level infrastructure, townships.

India has emerged as a safe investment destination in the last decade. The construction (infrastructure) activities and construction development (townships, housing, built-up infrastructure, and construction-development projects) were amongst the ten largest FDI recipient sector ranking at 6th and 7th position. Between from Apr 2000 – September2024, they cumulatively received INR 3,832.30 billion and their share in total FDI inflows stood at nearly 8.3% in the total cumulative FDI inflow in India (INR45,966 billion).

Segment	FY 2021 INR Bn	FY 2022 INR Bn	FY 2023 INR Bn	FY 2024 INR Bn	Cumulative FDI From Apr 2000-September 2024 INR Bn
Construction Development Townships, housing, built-up infrastructure, and construction-development projects	31.17	9.32	11.96	21.13	1,326.01
Construction (Infrastructure) Activities	582.40	241.78	135.88	350.76	2,506.29

Structural Steel Demand Scenario in End user Industries

Structural Steel form the backbone of construction projects in India, playing a critical role in bridges, highways, railways, buildings, high-rise structures, and industrial facilities. The Indian government actively fosters growth in this sector through initiatives like the "Smart Cities Mission" and "Make in India," which aim to boost steel demand for modern urban and industrial development. Investments in metro rail systems, highway expansions, and urban infrastructure underline this commitment. Additionally, the National Steel Policy (NSP) 2017 targets increasing domestic steel consumption to 160 kilograms per capita by 2030, further supporting the sector's expansion and its role in nation-building.

Infrastructure Construction in India

The infrastructure construction segment in India is a key driver of economic growth and national development. It encompasses the development and maintenance of essential infrastructure like roads, highways, railways, airports, ports, waterways, power plants, and irrigation systems.

Major demand generating Government Initiative in Infrastructure sector

Multiple flagship scheme focussing the development of infrastructure construction creates immense good demand growth potential for structural steel. These are discussed below:

National Infrastructure Pipeline (NIP)

If India is to become a USD 5 Trillion economy by 2027-28, as well as continue it strong economic growth, the country will have to spend close to USD 4.5 trillion on infrastructure construction by 2030. National Infrastructure Pipeline is the consolidated platform that captures the multiple infrastructure investment projects planned by the Government to propel Indian economy to USD 5 trillion mark.

In December 2019, an investment worth INR 102 trillion was announced by the government on infrastructure projects over the next five years under the National Infrastructure Pipeline (NIP). The task force on NIP increased this amount to INR.111 trillion in May 2020 from its initial projection of INR102 trillion which translate in per year spending of around INR 22 trillion. The National Infrastructure Pipeline aims to improve the ease of living for its citizen. National Infrastructure Pipeline will include projects in various sectors such as housing, safe drinking water, access to clean and affordable energy, world-class educational institutes, healthcare for all, modern railway stations, airports, bus terminals, metro and railway transportation, logistics and warehousing, irrigation projects, etc.

The projects under NIP are classified as per their size and stage of development. The Centre (39%) and state (40%) are expected to have almost equal share in implementing the NIP in India, followed by the

private sector (21%). The amount allocated under NIP will be spent on building highways, railway lines, ports and airports and other social and economic infrastructure.

Sub Sector	Amount to be invested between 2020-25 in INR Bn	% Share in Total Investment
Road	20,338	18.3%
Railway	13,676	12.3%
Aviation	1,434	1.3%
Urban Infrastructure	19,193	17.2%
Industrial Infrastructure	3,150	2.8%
Others	53,514	48.1%
Total	1,11,304	100%

Sources: NIP Presentation4F[5]

Sector-wise annual capital expenditure in key sectors.

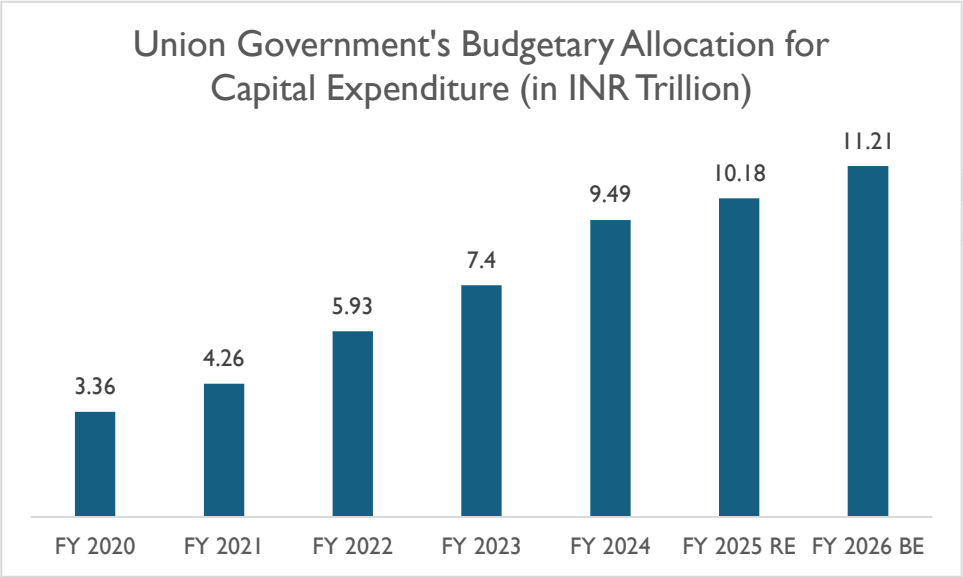
Key Sector	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2020-25
Roads	3,326	3,833	3,570	2,528	2,408	3,327	20,338.2
Railways	1,334	2,625	3,088	2,738	2,212	1,679	13,675.6
Ports	134	181	206	159	77	100	1,211.9
Airports	187	217	248	213	254	51	1,434.5
Transport Infrastructure	**4,980**	**6,855**	**7,112**	**5,638**	**4,951**	**5,157**	**366.6**
Urban Infrastructure[6]	**2,981.74**	**4,622.08**	**4,041.34**	**2,348.58**	**2171.64**	**1,598.62**	**19,192.7**
Rural infrastructure	1,035.60	1,163.10	1,099.30	270.6	270.6	270.6	4,109.6
Water and sanitation	367.6	605	1,008.80	848.2	800	-	3,629.6
Total Rural Infrastructure	1,403.10	1,768.00	2,108.10	1,118.80	1,070.60	270.6	7739.15
Irrigation	1,144.60	2,006.20	1,756.70	1,373.60	1,152.80	704.7	8,944.7
Tourism	11	15.8	20.6	18.6	12	7.2	197.8
Digital communication	783.6	618.5	545.4	387.2	381.2	380.9	3,096.7

Government Budgetary Allocation to the Infrastructure Sector

[5]https://dea.gov.in/sites/default/files/Report%20of%20the%20Task%20Force%20National%20Infrastructure%20Pipeline%20%28NIP%29%20-%20volume-i_1.pdf

[6] Atal Mission for Rejuvenation and Urban Transformation, Smart Cities, MRTS, Affordable Housing, Jal Jeevan Mission

Growing infrastructure spending is vital for overall infrastructure development as it has a multiplier effect on overall economic growth. By allocating substantial funds to the development of roads, railways, airports, and urban infrastructure, the government stimulates economic growth and improves public facilities. This investment not only enhances connectivity but also creates a ripple effect, driving demand for various allied industry including structural steel.



Union Budget, Government of India

Budgetary Allocation to Key Sectors (Amount in INR billion)

Key Sectors	FY'20	FY'21	FY'22	FY'23	FY'24	FY'25 RE	FY'26B.E.	CAGR FY 20-24	y-o-y Growth FY'26
Railway	678.42	299.26	1,172.71	1,592.56	2,426.48	2,523.77	2,520.00	37.52%	-0.1%
Road & Bridget	707.14	922.94	1,167.88	2,104.96	2,698.65	2,588.53	2,591.18	39.77%	0.1%
Energy & Power	13.74	30.19	35.20	20.83	69.99	59.77	106.46	50.23%	78.1%
Water Transport	0.00	0.00	4.68	5.44	10.11	7.08	12.55	NM	77.3%
Irrigation	2.59	1.33	1.59	1.38	1.80	2.41	4.86	-8.75%	101.5%
Urban Development	37.13	17.21	43.60	67.99	44.70	61.75	49.91	4.75%	-19.2%
Total of the above	1,439.02	1,270.92	2,425.65	3,793.17	5,251.74	5,243.31	5,284.96	38.22%	0.8%

Sources: Union Budget, Government of India, y-o-y growth in FY 2026 is B.E. over RE, B.E is Budgeted Estimate and R.E. is revised estimates

Witnessing the CAGR growth of the budgetary allocation historically, construction of the road & highway, railway, energy and power and Urban Infrastructure has remained a focused area over the period FY

2020-24. While in Union Budget 2025-26, spending towards energy and power, water transport and Irrigation increased substantially over the previous year revised estimated. Substantial budgetary allocation for the development of roads, railways, airports, and urban infrastructure, the government stimulates economic growth and improves public facilities. Consequently, the government's focus on capex not only accelerates infrastructure development but also opens a plethora of opportunities for structural steel demand growth in India.

Transport and Logistics

Logistic industry is a backbone of the economy, providing efficient and cost-effective transportation of good from the point of origin to that of consumption and a critical component to support economic growth. Initially focused on transportation, it now encompasses fleet operations, storage, warehousing, supply chain solutions, and value-added services. The sector provides livelihood to over 22 million people and improving the sector would have a cascading effect on the country's exports growth. Growth in volume of freight movement from major manufacturing segments such as cements, metals, retail, auto, textiles, pharma, and consumer goods, determine growth of logistics services.

Major Highlight

- Indian freight and logistics market is estimated reach USD 317.26 billion in 20245F7.
- India successfully ascended from the 44th to the 38th position in the World Bank's Logistics Performance Index (LPI) 2023, demonstrating notable progress.
- Logistic cost in India currently stands between 7.8-8.9% of GDP, intriguingly closer to a level seen in developed nations.

Transport Sector in India is a very extensive system comprising different modes of transport like roads, railways, aviation, inland waterways, shipping, and pipeline that facilitates easy and efficient movement of freight/cargo movement across the country. Transportation of goods takes place through various modes such as roadways, railways, waterways, airways. As per the transport in logistics, roads have the largest percentage share of 73% followed by rail (18%), water (5%), and air (5%).

Over the past nine years, the country has seen a significant expansion in its transportation infrastructure, reflecting a broader commitment to economic development. The Indian Railways has significantly upgraded its capacity, with new trains such as Vande Bharat and a dramatic increase in railway track construction from 1,452 km/year to 5,243 km/year. Air travel has also surged, with the number of airports planned to

[7] LogiMAT India.

increase to 220 airports by 2025. Additionally, the government's focus on operationalizing 23 waterways by 2030 and developing 35 Multi-Modal Logistics Parks underscores its commitment to enhancing transportation infrastructure.

The transportation sector's growth is supported by substantial investments, with the Union government allocating 3.3% of the GDP towards infrastructure in FY24. The India Investment Grid (IIG) database highlights around INR 69 trillion worth of projects, predominantly in roads and highways, followed by railways and urban public transport. This massive expansion in modern transportation facilities such as airports, railways, and logistics parks require advance and sophisticated engineering driving the demand for structural steel industry.

Bridges & Girders:

Steel plays an essential role in the construction of modern bridges, particularly in bridge girders, structural supports, and decks. Its use enables the creation of long-span, durable, and corrosion-resistant bridges, which are crucial for maintaining reliable and efficient transportation networks. The Indian government supports bridge construction through dedicated funding under national highway programs, facilitating the development of critical infrastructure across the country. Furthermore, partnerships with engineering firms help incorporate advanced fabrication techniques, ensuring bridges meet stringent standards of safety and performance. Over the past nine years, the country has seen a significant expansion in its transportation infrastructure, reflecting a broader commitment to economic development. The national highway network has expanded by 60% to 145,240 km, with ambitious plans to reach 200,000 km by 2025 which is expected to drive the structural steel consumption in the roads and highway segment.

Railways & RDSO

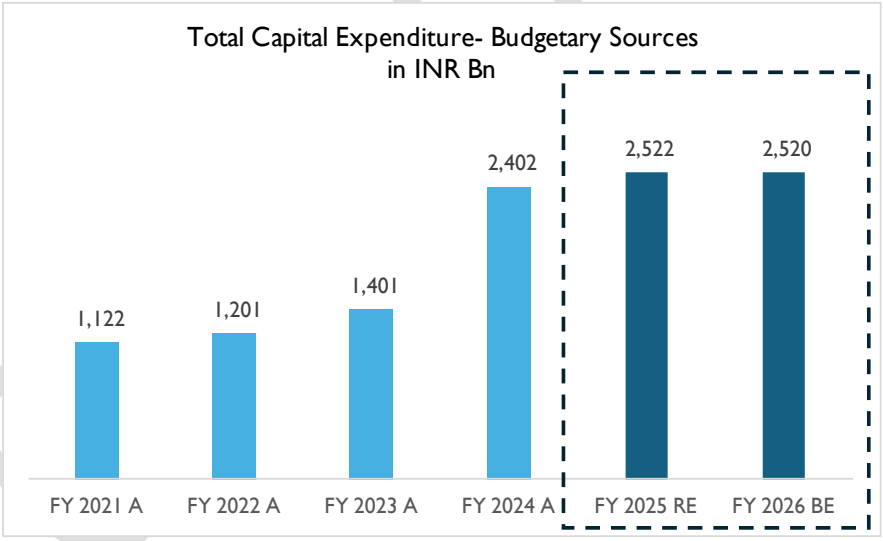
Steel is a cornerstone of railway infrastructure in India, being used in bridges, tracks, structural supports, and railway materials, with a particular emphasis on corrosion-resistant components. Structural Steel ensures the precision, quality, and durability of critical railway infrastructure, including rolling stock, facilitating the smooth operation of the national rail network. The Indian government plays an active role in the sector by collaborating with fabricators to modernize the railway system. It provides funding for network expansion, the development of high-speed corridors, and metro rail systems, further improving the efficiency and coverage of rail services.

The modernization of railway stations in India encompasses a wide range of initiatives aimed at enhancing infrastructure, amenities, and services to provide passengers with a world-class travel experience. This includes the construction of modern waiting halls, waiting rooms, restrooms, and passenger lounges

equipped with amenities such as Wi-Fi connectivity, charging points, and digital display boards providing real-time information about train schedules and arrivals. Additionally, efforts are underway to improve accessibility for passengers with disabilities by installing ramps, elevators, and other facilities to ensure equitable access to railway services.

Increase in Railway Construction and Its Impact on Structural Steel demand

From FY 2021 to FY 2026, the union budget has significantly ramped up its allocation toward railway sector. The total outlay provided for Capital Expenditure in Budget Estimate 2025-26 of INR 2,652 billion. The Gross Budgetary Support for Railways in FY 2025-26 stands at INR 2,520 billion, which has reduced in compare of previous year, however the budget has significantly rise from the level of INR 1,122 billion in FY 2021. The railway will continue to utilize the money in essential infrastructure projects like rail track expansion, rolling stock procurement, electrification, signalling improvements, and station modernisation. The Government also provided for INR 100 billion from extra budgetary resource to meet its expenses & modernize. The total outlay also includes Nirbhaya fund of INR 2 billion and INR 30 billion for internal resources.



Source: Union Budget, Expenditure Profile

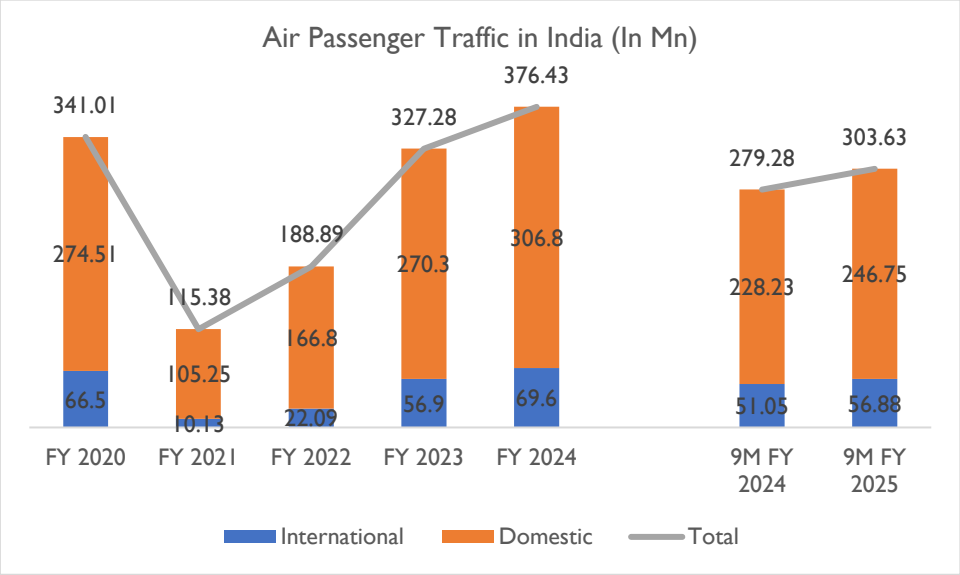
Note: A – Actual Capex over the years and BE – Budgeted figures

Railway sector improvement is a major driver of structural steel demand. The expansion of railway networks increases the structural steel demand as railway bridges and stations require substantial amounts of structural steel like beams, columns, and slabs to ensure stability and earthquake resistance. Indirectly, the growth in railway projects stimulates related sectors like logistics, warehousing, and manufacturing hubs near railway stations, further boosting the demand for structural steel. Urbanization along railway lines also leads to the development of commercial buildings, residential

complexes, and public infrastructure, all of which depend on structural steel. Furthermore, specific types of railway projects, such as high-speed rail or dedicated freight corridors, may necessitate specialized structural steel with higher strength or corrosion resistance driving the overall demand for structural steel.

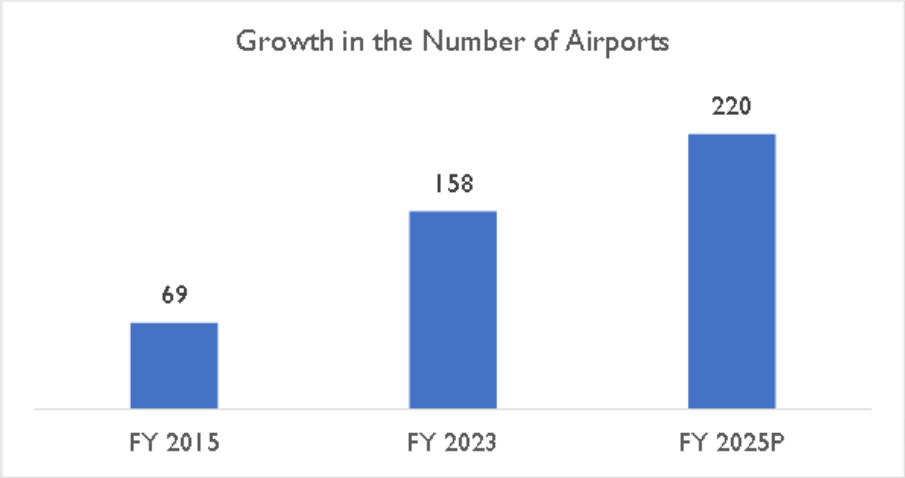
Airport Infrastructure in India

India has witnessed massive growth in air travel in the recent years, with annual rate of growth in air passengers trumping the growth rate in passengers carried by railways. India is today the third largest civil aviation market in the world, in terms of total number of air passengers carried per annum. The total passengers carried by Indian airlines has increased at CAGR of 2.5% increasing from 341.01 million in FY 2020 to 376.43 million in FY 2024 while during 9M FY 2025 it registered 8.7% y-o-y growth over the corresponding period last year (CPLY).



Source: Airports Authority of India

The air passenger traffic in India is expected witness healthy growth on the back of growing economy and expanding middle class accompanies by improving civil aviation infrastructure. The Indian government is investing heavily in the aviation sector. According to the Airports Authority of India (AAI), in the last eight years, the number of airports in the country has increased from 69 in FY 2015 to 158 in FY 2023, and it is projected that by FY 2025 the number of operational airports will increase to 220 in India.



Source: Airports Authority of India (AAI)

Government Initiatives for expanding airport infrastructure.

To address the growing demand for air travel, the Government of India is significantly expanding the nation's airport infrastructure. The vision is to increase the number of operational airports from 158 in FY 2023 to 220 by 2025. This ambitious goal is supported by the 'NABH Nirman' scheme, introduced in the 2018 Budget, which aims to quintuple airport capacity to handle up to a billion trips annually. The scheme includes plans for constructing 100 new airports over the next decade with an investment of INR 2,000 billion. Complementing this, airport operators and developers have outlined a Capital Expenditure (CAPEX) plan exceeding INR 900 billion, with the Airport Authority of India (AAI) contributing over INR 260 billion towards modernization and development by 2025.

Additionally, the government has approved INR 45 billion for reviving and developing un-served and under-served airports, heliports, and water aerodromes under the Regional Connectivity Scheme (RCS) - UDAN (Ude Desh ka Aam Naagrik). Launched in October 2016, UDAN aims to enhance regional air connectivity by making air travel more affordable and accessible in underserved areas.

Since its inception, RCS-UDAN has connected 85 unserved airports, 19 underserved airports, and 14 water aerodromes through 948 routes. As of March 31, 2023, the scheme has facilitated 117 lakh domestic passengers and operated 2.24 lakh flights. Building upon the regional connectivity scheme called Ude Desh ka Aam Naagrik (UDAN), the Union budget 2025-26 has proposed the launch of a modified UDAN scheme to enhance regional connectivity to 120 new destinations over the next 10 years. This will cover helipads and smaller airports in remote districts in the hilly regions and Northeastern states.

The ongoing initiatives are expected to significantly boost airport infrastructure by increasing capacity, improving regional connectivity, and accelerating the development of new and existing airports. This expansion will not only accommodate rising air traffic but also stimulate economic growth and enhance accessibility across the country.

Some of the major expansion plans proposed to expand the airport infrastructure in India:

Twin City Airport Project

The Ministry of Civil Aviation is proposing to develop "Twin City Airports" aimed to decongest existing major airports. True to its name, these airports would be constructed keeping in mind its ability to serve two cities / urban areas. The Ministry is proposing to develop six such twin city airports by 2030, expand it to 15 by 2040 and to 30 by 2047.

So far three locations has been identified for developing such airports – namely development of Noida International Airport at Greater Nodia (to alleviate / decongest Delhi International Airport), DB Patil International Airport in Navi Mumbai (to decongest Mumbai International Airport), and development of Manohar International Airport (to complement Dabolim airport in Goa). In additional several state Governments has approached the central Government to develop greenfield airports that fits into this programme.

Real Estate Construction

The influx of populations into urban areas necessitates new housing and infrastructure, including roads, bridges, and public amenities, all of which rely heavily on structural steel. Additionally, large-scale urban development projects, like smart city initiatives, focus on creating sustainable and efficient urban environments, using extensive structural steel in residential, commercial, and public infrastructure. The increase in new construction projects significantly boosts the demand for structural steel. Thriving real estate markets often trigger a surge in residential developments, including single-family homes, apartments, and high- rise buildings, which are major consumers of structural steel. Similarly, commercial construction projects, such as office buildings, shopping malls, and hotels, also require substantial amounts of structural steels for their steel frameworks. Increased renovation and remodeling activities during periods of real estate growth also contribute to the demand for structural steel, as homeowners and businesses invest in structural modifications and property upgrades.

Conversely, a reduction in new construction projects leads to a decrease in structural steel demand. A slowdown in the real estate market results in fewer residential projects, with developers becoming

cautious and delaying or canceling plans. Commercial real estate projects are similarly affected, often put on hold during market downturns, further reducing the need for structural steel. Decreased infrastructure development due to economic uncertainty can cause delays or reductions in urban projects, lowering structural steel consumption. Cutbacks in government spending during economic downturns also impacts the demand for structural steel used in public construction projects. Additionally, oversupply and market saturation can lead to an inventory backlog, prompting developers to halt new projects until existing units are sold, thereby decreasing the need for structural steel demand. Price reductions to clear unsold inventory can further reduce the initiation of new projects, diminishing the overall demand for structural steel.

Performance snapshot of Indian Real Estate sector

Real estate construction is one of the key economic sectors in the country driving the demand for various building materials including structural steel. The residential market continues to strengthen, with sales volumes at a ten-year high, unaffected by underlying fundamentals. Sales levels remained resilient despite concerns over growing inflation, high interest costs, and slowing economic growth. The industry is consolidating, with residential developments increasingly being managed by stronger developers who have weathered the economic challenges posed by the pandemic.

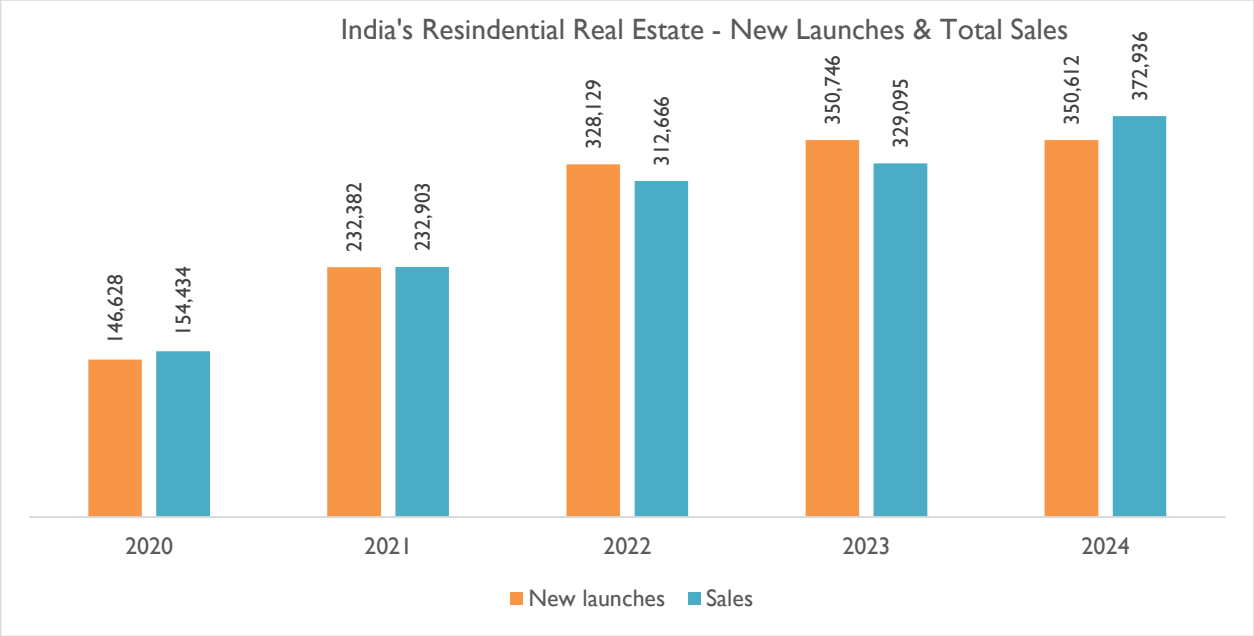
Residential Real Estate

The residential real estate market is a vital sector within the broader real estate industry that revolves around the desire for home ownership. Residential real estate markets are influenced by a range of factors such as job stability, income growth, and favorable interest rates which can create an environment where people feel confident to invest in their homes. Location also plays a significant role, as buyers seek neighborhoods that offer convenience, safety, and access to essential amenities that enhance their quality of life.

Government policies and regulations also impact residential real estate markets. Housing policies, tax incentives, and mortgage regulations can affect affordability, accessibility, and investment potential. Additionally, demographic trends, such as population growth, changes in household sizes, and shifts in lifestyle preferences, contribute to the demand and preferences within the market. As per industry sources, the Indian real estate market is projected to reach the value of USD 1 Trillion by 2030, with affordable housing segment playing an important role. Supply of houses and new launches are also expected to accelerate the growth of residential real estate sector.

Annual Sales & Launches

The Indian residential real estate sector has been witnessing a steady recovery since 2021. During 2024, 350,612 new residential units were launched across the top 8 cities, which was slightly lower (-0.04%) than the previous year level, however, sales volume continued to grow stronger to 372,936 units, registering y-o-y growth of 13.3%. Increased savings during lockdowns, minimal income disruptions for mid and high-income brackets, and a robust economic growth forecast have fueled demand in India's residential real estate market. Additionally, the upward trend in house prices since 2021 has created a positive sentiment among prospective buyers, boosting sales. Between CY 2020-24, the new launches grew at a CAGR 24.4% while sales volume by 24.7% CAGR.



Source: Knight Frank Report on Indian Real Estate Sector (Statistics for Top 8 Cities in India)

Sales & Launches by Cities

Among top 8 markets, Mumbai accounted for 27.5 % of the total sales, which is highest among all the markets. Kolkata, Ahmedabad, and Pune displayed robust growth with strong uptick in both sales and launches. Increased hiring and steady income growth dominated the new-age markets such as Ahmedabad and Pune, also buoyed homebuyer demand.

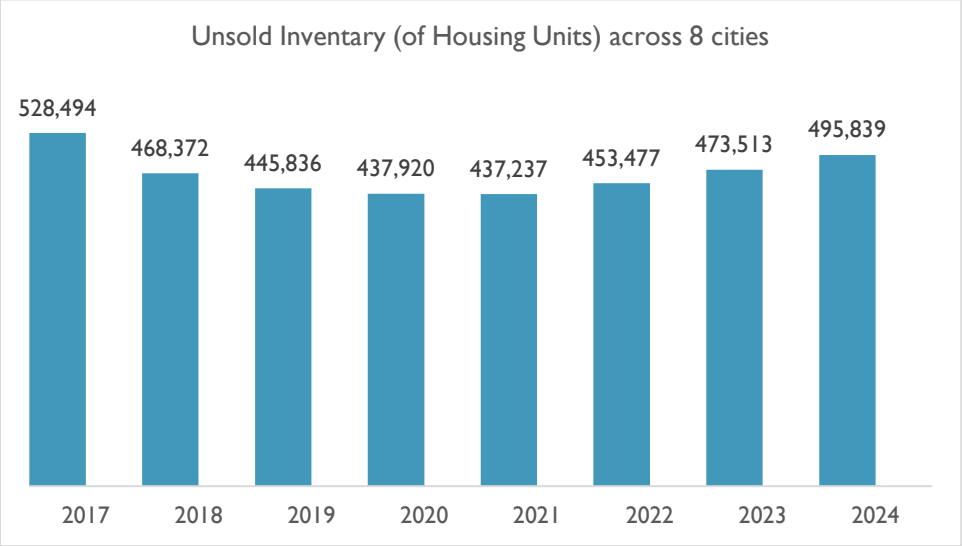
City	Launches		Sales	
	H2 2024 (YoY change)	2024 (YoY change)	H2 2024 (YoY change)	2024 (YoYchange)
Mumbai	49,485 (16%)	96,470 (4%)	48,928 (6%)	96,187 (11%)
NCR	30,119 (-8%)	60,699 (-3%)	28,656 (-4%)	57,654 (-4%)
Bengaluru	30,447 (10%)	56,014 (10%)	27,958(1%)	55,362 (2%)

Pune	31,501(49%)	59,548 (40%)	27,821 (1%)	52,346 (6%)
Hyderabad	21,713(-10%)	44,013 (-6%)	18,401(5%)	36,974 (12%)
Ahmedabad	11,805 (-1%)	22,043 (-2%)	9,085 (12%)	18,462 (15%)
Chennai	8,576 (5%)	17,431 (7%)	8,263 (6%)	16,238 (9%)
Kolkata	5,889 (-34%)	16,718 (6%)	8,259 (8%)	17,389 (16%)
All India	177,371 (3%)	350,612 (7%)	189,535 (7%)	372,936 (6%)

Source: Knight Frank Report on Indian Real Estate Sector (Statistics for Top 8 Cities in India)

Inventory Scenario

As mentioned earlier, while sales have been increasing, the volume of launches has exceeded that of sales. This has caused the unsold inventory levels to rise by 6% YoY.



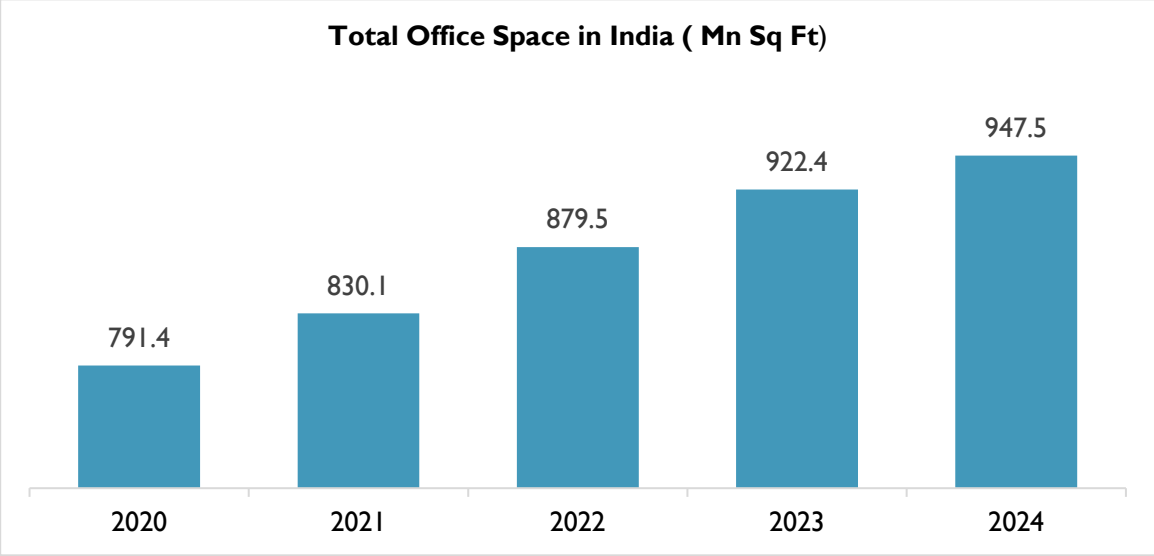
Source: Knight Frank Report on Indian Real Estate Sector (Statistics for Top 8 Cities in India)

In 2024, the unsold housing inventory across the top 8 cities has increased to 4,95,839 units from 4,73,513 units in 2023. Despite the rising inventory levels, the Quarters to Sell (QTS) metric continues to show an improving trend, indicating steady absorption rates. The QTS level, which had declined from 8.7 quarters in H2 2020 to 5.9 quarters in H2 2023, has likely further improved in 2024, reflecting sustained housing demand.

Commercial Real Estate:

India's emergence as the world's largest democracy, coupled with its promising long-term growth potential and stable market conditions across various sectors, positions it as an extremely appealing location for establishing businesses. The total office space stock in India grew by 4.6% CAGR between 2020-24. This indicates a consistent rise in demand for office space, potentially driven by factors like economic expansion and increasing urbanization. Interestingly, the latest growth rate in 2024 (2.27%) is slightly lower compared to the average annual growth. The growing acceptance of hybrid work

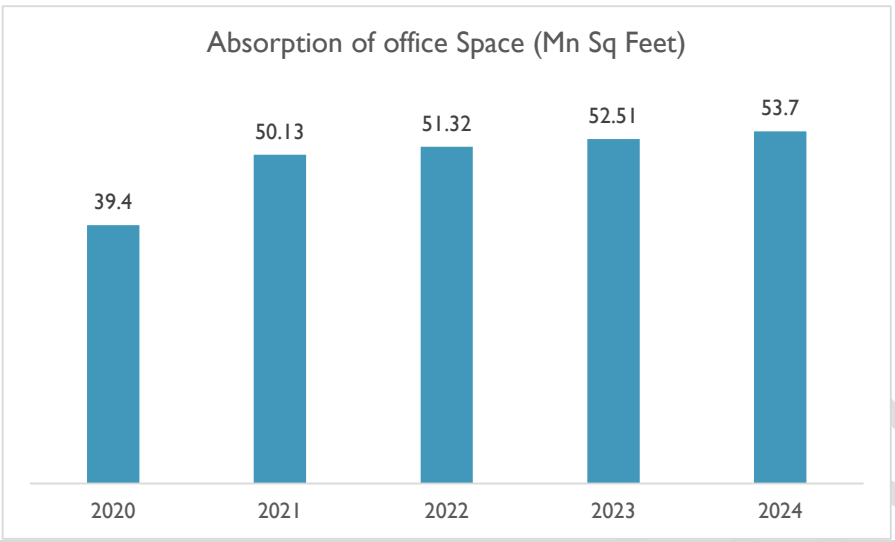
arrangements, where employees split their work time between home and office, could potentially lead to a reduced need for traditional office space requirements coupled with shifting interest of developers in residential market due to booming opportunities in this sector.

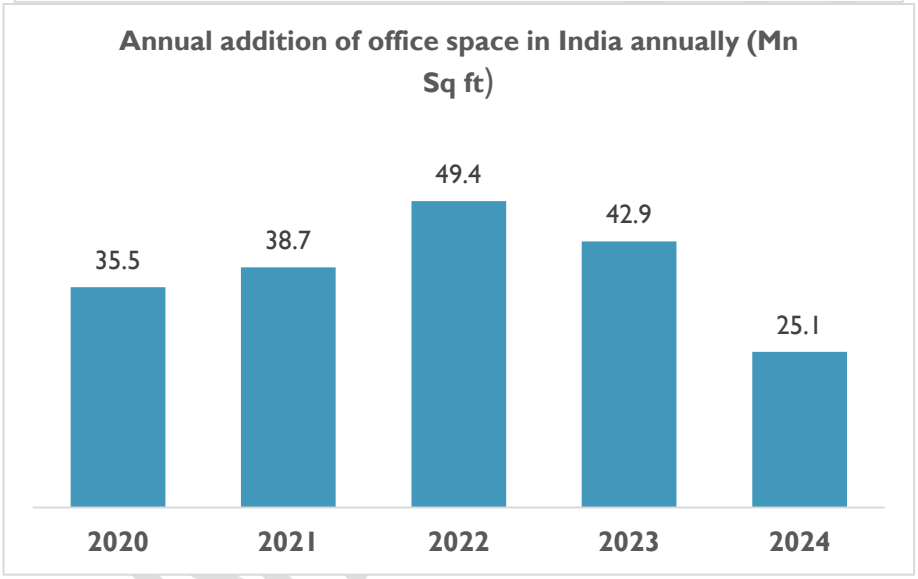


Source: Knight Frank, Industry Sources

Demand Supply Scenario

The year 2024 was a landmark year for Indian commercial office space segment, reaching record high absorption / transactions continuing the steady growth in absorption. In 2024, approximately 53.7 million sq.ft of office space was transactions – leasing / rentals. Transactions received a boost as the service industry readied for a return to office scenario. Increasing transaction in 2023 points towards improving demand presenting a favorable demand scenario for structural steel consumption in office space segment. Meanwhile, the addition of new office space declined sharply compared to previous year indication moderation. The decrease from 42.9 to 25.1 million sq ft in the year 2024 indicates a moderation in the pace of new supply. With hybrid work models gaining traction, some businesses deferred or reduced expansion plans, resulting in lower demand for new office space in 2024.





Source: Knight Frank, Industry Sources

Major Schemes in the Real Estate sector

Smart cities mission:

Launched on June 25, 2015, the Smart Cities Mission aims to develop 100 cities into sustainable, smart urban spaces, focusing on key areas such as healthcare, sanitation, infrastructure, ecology, education, safety, and economic opportunities. With an estimated cost of up to INR 7,000 billion, the mission prioritizes smart solutions such as ICT-based infrastructure, data-driven governance, and sustainable development, aiming to improve the quality of life for urban residents. It also encourages public-private partnerships to expedite the implementation of urban projects, fostering greater community participation and efficient resource use. With 100 cities leading the initiative, the mission has made significant progress, having completed 7,380 out of 8,075 projects, with an investment of INR 1,47,704 crore according to the Ministry of Housing and Urban Affairs (MoHUA). As of 13th December 2024, 91% of the total projects

have been successfully completed, reflecting significant progress in reshaping urban landscapes across India. These initiatives aim to improve urban infrastructure and citizen services. In Union Budget 2025-26, no budgetary allocation was made for this scheme since the mission deadline will end in in June 2025.

Pradhan Mantri Awas Yojana (Urban) also launched on June 25, 2015, focuses on providing affordable housing for all in urban areas by 2022. With a target of constructing 1.12 crore houses between FY 2015-22, the scheme aims to address the housing shortage in urban areas, especially for the economically weaker sections. As of recent reports, more than 1.12 crore houses have been sanctioned for construction under the scheme. The PMAY has multiple components to cater to various needs: In-situ Slum Redevelopment to improve living conditions of slum dwellers, Credit Linked Subsidy Scheme for home loans with interest subsidies, Affordable Housing in Partnership for collaboration between government and private developers, and Beneficiary-led individual house construction for marginalized individuals. Depending on the areas it serves, the scheme is divided into two sections: Pradhan Mantri Awas Yojana-Urban (PMAY-U) and Pradhan Mantri Awas Yojana Gramin (PMAY-G). Launched in November 2016, PMAY-G was designed to support 'Housing for All by 2022' by building 2.95 crore houses for the rural poor across the country by 2022.

Updates on PMAY:

Aspect	As of September 2024,
Houses Sanctioned	1.2 Crore
Houses Grounded	1.2 Crore
Houses Completed	0.9 Crore
Central Assistance Committed	INR 2trillion
Central Assistance Released	INR 1.64 trillion
Total Investment	INR 8.07 trillion

In union budget 2024, the government announced to address the housing needs of 1 crore urban poor and middle-class families in the next 5 years under the PMAY-U 2.0. Under PMAY-U 2.0, 2.95 crores more houses will be constructed. A provision of INR 35 billion towards the same in the union budget 2025-26.

Atal Mission for Rejuvenation and Urban Transformation (AMRUT scheme): The AMRUT scheme was launched in selected 500 cities — covering around 60% of the urban population — and towns in June 2015, to provide basic civic amenities and urban transport to improve the quality of life, especially for the poor and the disadvantaged. The scheme has been earmarked with INR 100 billion in the Union Budget 2025-26 against the previous budgetary allocation of INR 80 billion.

Indian Retail Sector

Source:8 Dun & Bradstreet Desk Research

The organized retail is gaining ground at a brisk pace in India where a balance is emerging across shopping format that include hypermarkets, supermarket, and other large retail format like specialty store. Major retail chains are expanding their presence beyond metros and Tier-1 cities to tier-2, tier-3 cities and even in tier- 4 cities owing to lower rental rates and operating costs. This is translating into overall increase in nation's consumer power and benefitting the growth of organized retail in India. As per AT Kearney report, the organized retailing segment was estimated to value at USD 110 Bn in 2022 and is projected to grow to USD 230 Bn by 2030,

Malls are the largest format of organized retail available today. Since it is equipped with presence of dedicated multi-level parking, multi-brand retail outlet and exclusive retail outlet, hypermarket/supermarket, large food courts, restaurants, entertainment zone and many more, it precisely offers multiple convenience to consumer all under common roof. Beyond their retail offerings, malls and high streets provide safe and secure environments for social interaction and quality time with loved ones.

India ranks among one of the best countries to invest in the retail space. Since 2020, retail demand has increased regularly across investment grade malls, well-known high streets, and independent developments. With 275 to 300 million square feet already operational in the country, the retail sector witnessed all time high leasing activity taking total leased space to 7.1 million square feet[6] during 2023,

[8] Market Size number based on report published by AT Kearney a global competitive intelligence company tracking retail sector.

registering a year-on- year rise of 47%[7]. The report further highlighted that recently completed mall contributed towards 30% share in total lease space absorption in 2023. On supply side, the sector witnessed a peak retail supply of 6 Mn sq feet, witnessing 316% y-o-y growth on the back of commencement of supply of 12 investment grade mall across the 8 cities.

As per, Deloitte India and the Shopping Centre Association of India (SCAI), malls and shopping centres play is projected to grow at 17% CAGR from 2022 to 2028, which present a conducive demand scenario for TMT bar consumption growth in India.

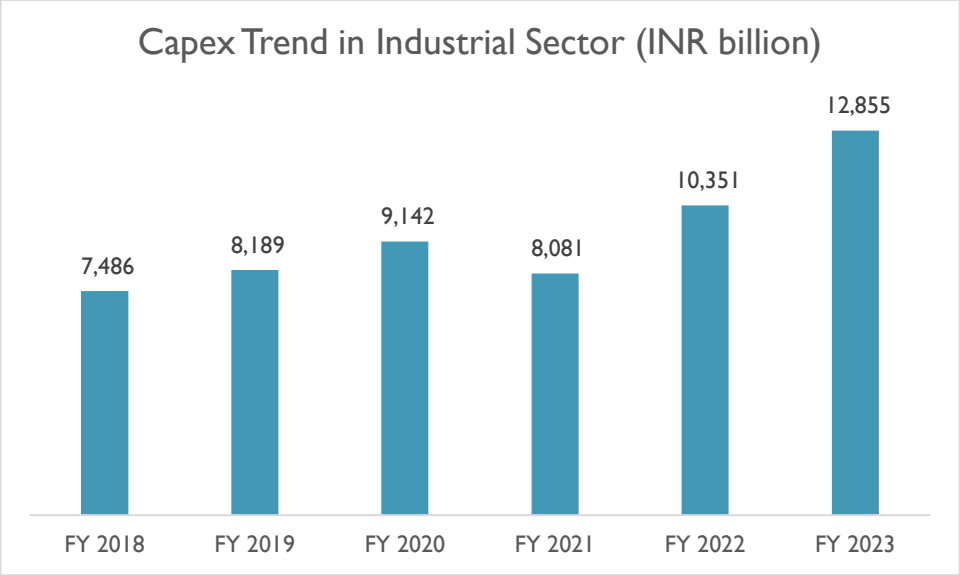
High-Rise Buildings and Data Centers

Steel is a fundamental material in constructing high-rise buildings, data centers, and industrial facilities. Its strength, flexibility, and scalability make it essential for modern, large-scale infrastructure projects. Structural Steel ensures that these buildings are not only safe and durable but also compliant with international standards. The government, through the Bureau of Indian Standards (BIS), sets guidelines for disaster-resistant and eco-friendly building designs, pushing for the use of advanced fabrication technologies in large-scale construction projects. This ensures that India's urban growth is supported by resilient, sustainable, and cutting-edge infrastructure.

India's data center market is poised for significant growth, with projections indicating an expansion from USD 4.5 billion in 2023 to USD 11.6 billion by 2032, according to the Economic Survey 2024-25. This growth represents a compound annual growth rate (CAGR) of 10.98%, underscoring the increasing demand for data storage and processing services in the country. Several factors are driving this surge, including the rapid digitization of industries, the rise of cloud computing, the expansion of e-commerce, and the growing need for secure data storage in sectors such as banking, healthcare, and government services. Additionally, the government's push for a digital economy, alongside policies like the Data Centre Policy and the recognition of data centers as critical infrastructure, is expected to further accelerate market growth. According to a report by CII-Colliers titled India's Data Centers, Oct 2023, India's data centre market, spread across 11.0 million sq ft with 819 MW of capacity is expected to double in size to 23 million sq ft by 2026 and attract nearly USD 10 billion in investment within the next three years. Factors such as growing digital public infrastructure, significant investments by large players in the sector, 5G rollout, and new applications of Artificial Intelligence (AI) coupled with data protection laws and state incentives are expected to support the growth of the data center industry in India.

Industrial Construction

India's industrial landscape is undergoing a transformative journey, fueled by ambitious government initiatives like "Make in India" and rapid economic growth. Amidst this transformation, the industrial construction segment stands as a key driver, laying the foundation for factories, power plants, logistics hubs, and other crucial infrastructure. This immense potential attracts both domestic and global players, leading to a vibrant and competitive landscape. Government spending on infrastructure development, rising automation in manufacturing, and expansion of sectors like chemicals, pharmaceuticals, and electronics fuel the demand for state-of-the-art industrial facilities are translating in rising construction activity in the industrial construction sector. The capex in industrial sector[9] measured in terms of GFCF has observed 11% CAGR growth, increasing from INR 7,486 billion to INR 12,855 billion.



Sources: National Account Statistic 2024

The China Plus One strategy is an approach adopted by companies and countries to diversify their supply chains away from excessive reliance on China as a manufacturing and sourcing hub. The strategy emerged as a response to various factors, including rising labour costs in China, geopolitical tensions, trade uncertainties, and the need to mitigate risks associated with being overly dependent on a single country for production and sourcing.

India, being one of the largest economies in the world and home to a vast workforce and diverse manufacturing capabilities, has been actively leveraging the China Plus One strategy to attract investments and businesses looking to diversify their supply chains away from China.

[9] GFCF in manufacturing taken as a proxy to reflect industrial sector contruction

India's vision of becoming 'Atmanirbhar' (self-reliant) and enhancing its manufacturing capabilities and exports has led to significant efforts and investment in the form of Production Linked Incentives (PLI) schemes. An outlay of INR 1.97 trillion (over USD 26 billion) has been announced in Union Budget 2021-22 for these schemes across 14 key manufacturing sectors from FY 2021-22. These PLI schemes are aimed at attracting companies looking to diversify their supply chains away from China. The incentives offered by the government, such as tax breaks and regulatory reforms, make India an attractive destination for businesses seeking to move their production from China to India. This proactive approach has further strengthened India's position as a preferred manufacturing base under the China Plus One strategy.

Additionally, The Indian government's commitment to creating a business-friendly environment has resulted in increased foreign direct investment (FDI) inflows in the country over the years. Since 2014-2015, when FDI inflows stood at USD 45.15 billion, now have shown consistent growth reaching a record high of USD 84.84 billion in the financial year 2021-22. The government's pro-business reforms, coupled with investment incentives offered under the PLI schemes, have played a vital role in attracting foreign investments and businesses seeking alternatives to China. Moreover, India has signed 13 Free Trade Agreements (FTAs) and six Preferential Trade Agreements (PTAs) so far, with ongoing FTA negotiations with the U.K, Canada, and the European Union expected to conclude, potentially opening up further opportunities for businesses exploring the China Plus One strategy. However, global uncertainties in FY 2023 resulted in a temporary drop in FDI inflows to USD 70.97 billion. Nevertheless, India's proactive measures, investment incentives, and access to FTAs remain valuable drivers for businesses considering the China Plus One strategy.

Other factors that India leverages include its access to domestic market, where India's large and diverse consumer base provides significant opportunities for companies exploring the China Plus One strategy. By establishing a presence in India, companies can access and serve this vast market, offering a compelling reason for incorporating India in their diversification plans. The 'Atmanirbhar' vision also emphasizes boosting domestic manufacturing to cater to local demand, making India an appealing market for businesses aiming to tap into the country's consumption potential.

Another factor adding to this is India's location in South Asia, which makes it a strategic hub for companies looking to expand their operations beyond China. Its proximity to both the Indian subcontinent and Southeast Asian markets provides a unique advantage for businesses seeking to serve a wide geographical area. In addition to the geographical advantage and manufacturing capabilities, India's growing technology and innovation sectors are another significant draw for businesses diversifying their supply chains. With India increasingly investing in research and development (R&D) and innovation-oriented operations,

companies have access to high-value opportunities to establish a presence in India and access its pool of skilled talent and cutting-edge research facilities.

Lastly, recognizing the importance of ease of doing business in attracting foreign investments, the Indian government has taken numerous steps to simplify regulations, reduce bureaucracy, and streamline approval processes. These efforts are aimed at creating a more business-friendly environment, making it easier for companies to set up and operate in India.

While significant progress has been made, challenges like inadequate infrastructure quality, skill gaps in the workforce, and limited access to financing remain concerns. The increasing integration of technologies like Building Information Modeling (BIM) and robotics is enhancing efficiency and reducing project timelines. Environmental considerations are gaining prominence, with green building practices and renewable energy solutions being incorporated into industrial construction projects.

Key Segments of the Industrial Construction

- Factory Buildings: This segment forms the backbone, catering to diverse industries with customized production spaces. Prefabricated structures and green building technologies are gaining traction for their efficiency and sustainability.
- Power Plants: The growing demand for energy necessitates the construction of new power plants across various technologies, including thermal, renewable, and nuclear. Expertise in specialized construction techniques and safety protocols is crucial in this segment.
- Chemical & Pharmaceutical Plants: Stringent safety regulations and specialized construction materials characterize this segment. Expertise in handling hazardous materials and adhering to environmental norms is essential.
- Refineries: Construction of facilities for processing crude oil into usable products like gasoline, diesel, and petrochemicals. High safety standards due to the flammable nature of materials, robust containment systems to prevent leaks, and adherence to environmental regulations.

Heavy Machinery

Structured steel is a vital material in the manufacturing of industrial girders, cutting tools, and heavy machinery used in the construction and manufacturing sectors. Structural Steel ensures precision, strength, and wear resistance, which are essential for the longevity and functionality of these industrial tools. The Indian government supports the production of heavy machinery and industrial equipment through schemes like "Atmanirbhar Bharat," which promotes self-reliance and encourages micro, small, and medium enterprises (MSMEs) to enhance production capabilities. Additionally, the promotion of

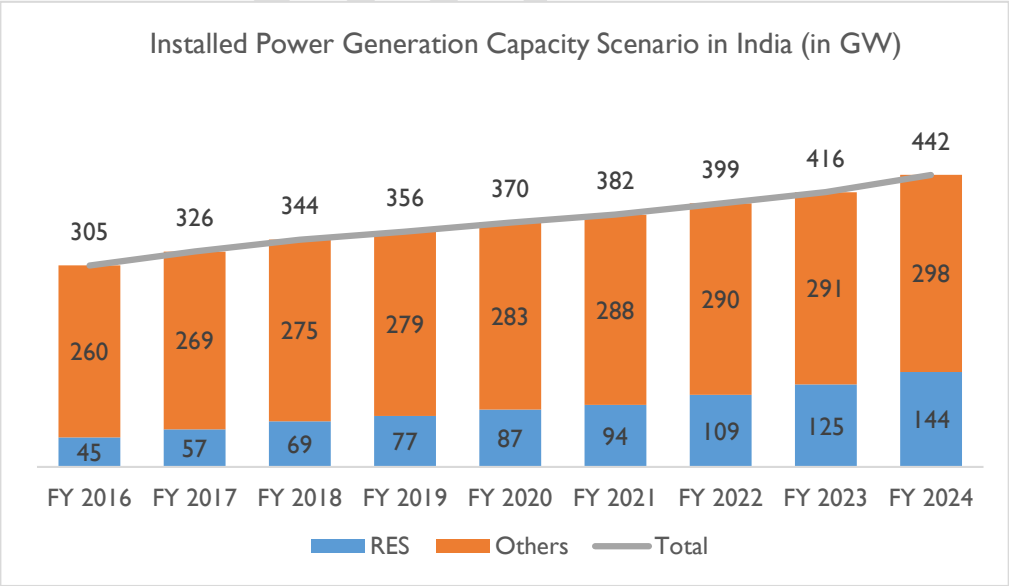
specialty steels suitable for high-stress applications ensures the resilience of machinery used in demanding industrial environments.

Energy Sector Demand Scenario: Thermal Power Plants and Renewable energy

In thermal power plants, high-temperature and high-pressure steel pipes (such as SA210, SA234, and T91) are essential for ensuring the safe and efficient operation of energy generation systems. Structural Steel supports the construction of critical components for both thermal and renewable energy plants, ensuring the structural integrity and longevity of these power plants. The government ensures compliance with ASTM and other international standards for quality, safety, and performance. Additionally, there is a growing investment in renewable energy projects that utilize steel components, promoting cleaner energy solutions.

Performance snapshot

The growth trajectory of India's power generation sector has been commendable, with the total installed generation capacity experiencing a CAGR of 5% between FY 2016 and 2024. However, the growth in renewable energy has outpaced that of other segments by a significant margin. The renewable energy segment achieved a compounded growth rate of nearly 16%, in stark contrast to the modest 2% growth seen in all other segments[10] combined over the same period.

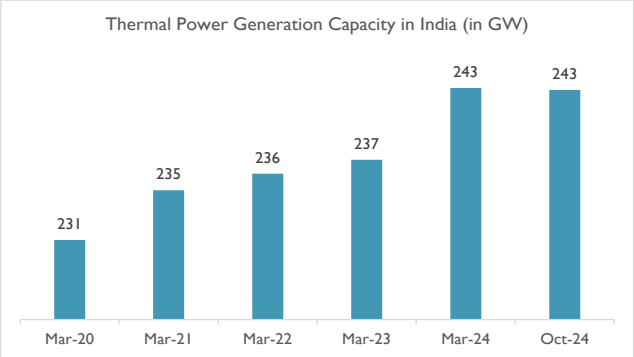


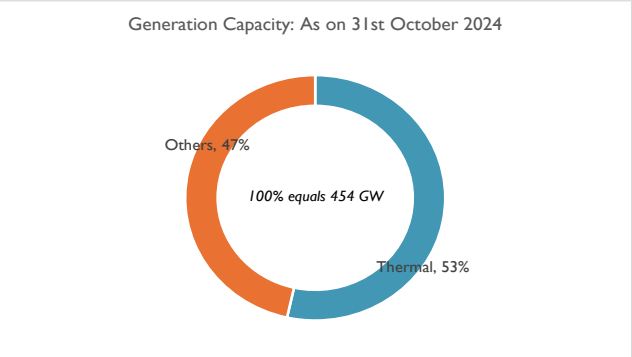
Source: Central Electricity Authority installed capacity for each year indicates the capacity as on 31st March of that year.

Thermal power capacity accounts for nearly 53% of total installed generation capacity in the country, as on 31st October 2024. Capacity addition in thermal power segment has slowed down, as the focus shifts

[10] Thermal, hydro and nuclear

to cleaner power sources like renewables. Because of this shift in focus, the rate of capacity addition in thermal power segment in India has been abysmal. Between 31st March 2020 and 31st October 2024, only 13 GW of capacity was added in the thermal segment.



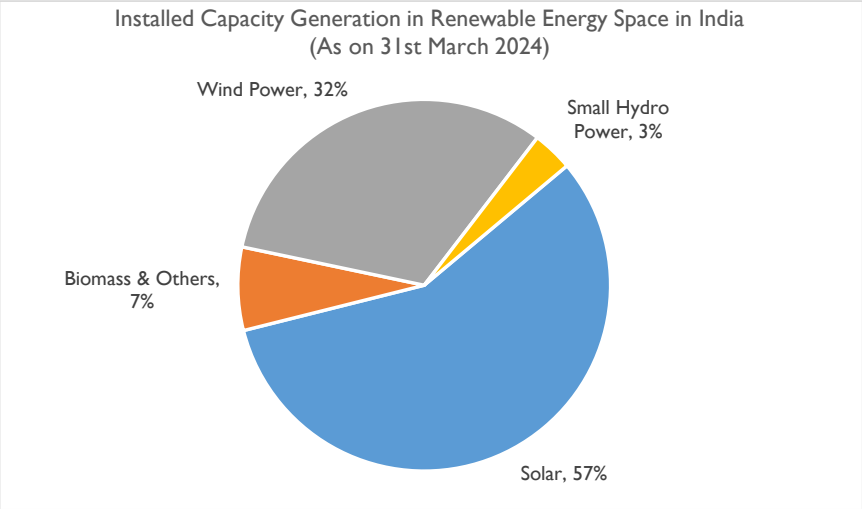


Source: Central Electricity Authority

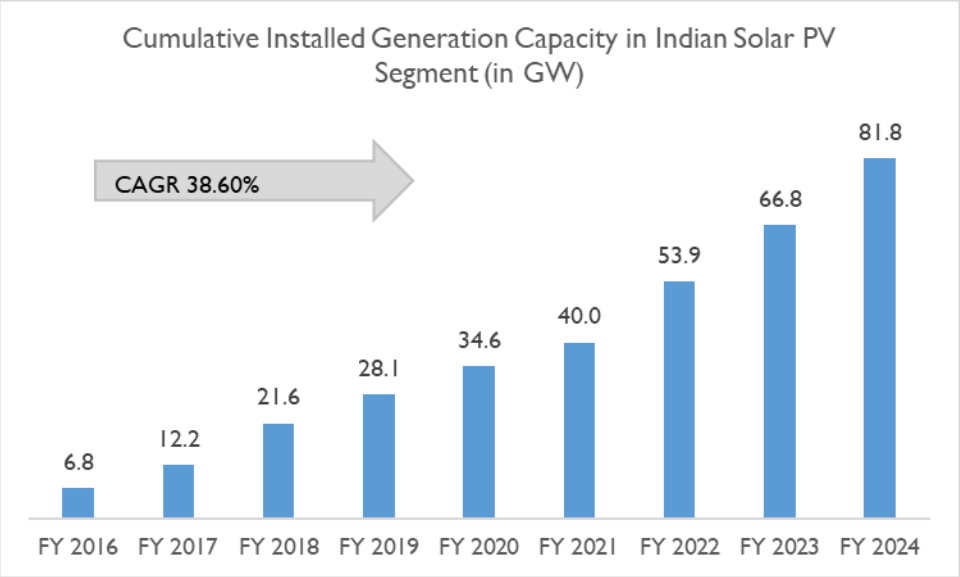
The country is witnessing steady growth in renewable energy space which is presenting new opportunities for the structural steel industry. As per International Renewable Energy Agency's 'Renewable capacity statistics 2023', India globally ranks 4th in Renewable Energy Installed Capacity, 4th in Wind Power capacity and 5th in Solar Power capacity. One of the key factors driving this growth is the increasing share of renewable energy in India's overall energy consumption.

As of March 31st, 2024, India's total installed power generation capacity reached approximately 442 GW[11], with renewable energy sources (excluding large Hydro) accounting for a notable 33% of this total capacity. Furthermore, renewable sources contributed to almost one-fifth of the country's total power generation output. Within India's renewable energy sector, solar power stands out as the predominant segment. As of March 2024, solar power generation capacity constituted approximately 57% of the total renewable generation capacity in the country.

[11] Central Electricity Authority, Ministry of Power



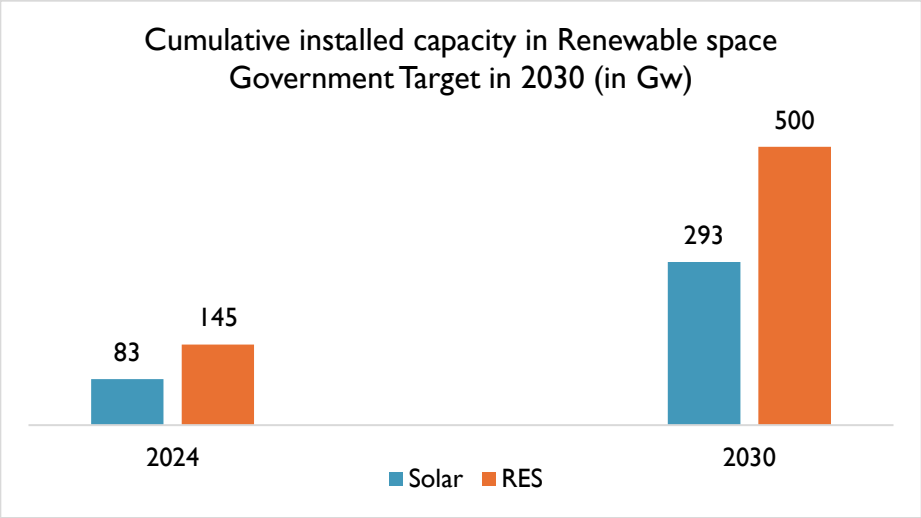
Source: Central Electricity Authority



Source: Ministry of New and Renewable Energy (MNRE)

Over the period spanning from FY 2016 to FY 2024, the cumulative installed solar PV power generation capacity in India witnessed a CAGR of 36.47%. This growth trajectory can be attributed to the proactive stance of the government, which has positioned solar power as a cornerstone of the Indian renewable energy sector. Through aggressive policy measures and initiatives, the government has played a pivotal role in fostering the expansion and adoption of solar energy, thus driving the nation towards sustainable energy development and independence.

Government Sets Ambitious Renewable Energy Targets for 2030



Source: MNRE, Government of India

In a strategic move towards sustainable energy, the government has set ambitious targets to significantly increase the country's renewable energy capacity by 2030. According to the newly released data, solar energy capacity is projected to rise from 83 GW in 2024 to an impressive 293 GW by 2030. Similarly, other renewable energy sources (RES) are expected to expand from 145 GW to 500 GW within the same period.

This planned increase represents approximately a 253% growth in solar capacity and a 245% growth in RES capacity over the next six years. The cumulative renewable energy capacity is slated to soar from 228 GW in 2024 to 793 GW by 2030. These targets indicate a significant expansion in renewable space driving the structural steel demand for solar module mounting structure and wind turbine tower.

Oil & Gas Industry

The oil and gas industry relies heavily on structured steel for building robust infrastructure essential for exploration, production, and distribution. Key applications include offshore platforms, drilling rigs, pipelines, storage tanks, and structural supports. High-strength steel is particularly vital for fabricating equipment such as pressure vessels, heat exchangers, and drilling tools, as these components must endure harsh environmental conditions and high operational stresses. Structural Steel plays a critical role in delivering durable and reliable products like steel pipes, tanks, and offshore platform components that meet the demanding requirements of this sector. The Indian government actively supports this industry through various initiatives, including policies promoting the use of domestically manufactured steel in oil and gas projects, fostering strategic partnerships with global companies to enhance production capabilities, and ensuring self-reliance in steel through the National Steel Policy (NSP) 2017. These efforts are pivotal in strengthening the industry's foundation and aligning it with national objectives.

According to IEA's report under the stated policy scenario, India's oil consumption is projected to rise significantly by 50% by 2030, compared to a global demand increase of only 7%. India's oil consumption is expected to grow from 4.8 million barrels per day (mbd) in 2019 to 7.2 mbd in 2030, and further to 9.2 mbd by 2050. India will continue to be the third largest consumer of oil in 2030. For natural gas, the country's consumption is projected to double from 64 billion cubic meters (BCM) in 2019 to 133 BCM in 2030, in contrast to a 12% rise in global gas demand. As of April 1, 2024, India holds the position of the fourth-largest refining capacity globally, following the United States, China, and Russia. The country's total refining capacity stands at 257 million metric tons per annum (MMTPA), with a daily refining capacity of 5 million barrels. Indian Oil Corporation (IOC), a leading Indian refiner, has indicated that the country needs to add 2 million barrels per day to its refining capacity by 2030 to support its economic expansion.

	Crude Oil Average price (India basket) USD/bbl.	Total Imports (MMT)	Domestic Production (MMT)	Total	% share of Imports	% share of Domestic Production
2019-20	60.47	226.95	32.2	259.12	87.59%	12.14%
2020-21	44.82	198.11	30.5	228.61	86.70%	13.34%
2021-22	79.18	212.4	29.7	242.1	85.50%	14.60%
2022-23	93.15	232.7	29.2	261.9	87.40%	11.15%
2023-24	90.23	233.1	29.4	261.9	87.70%	11.15%

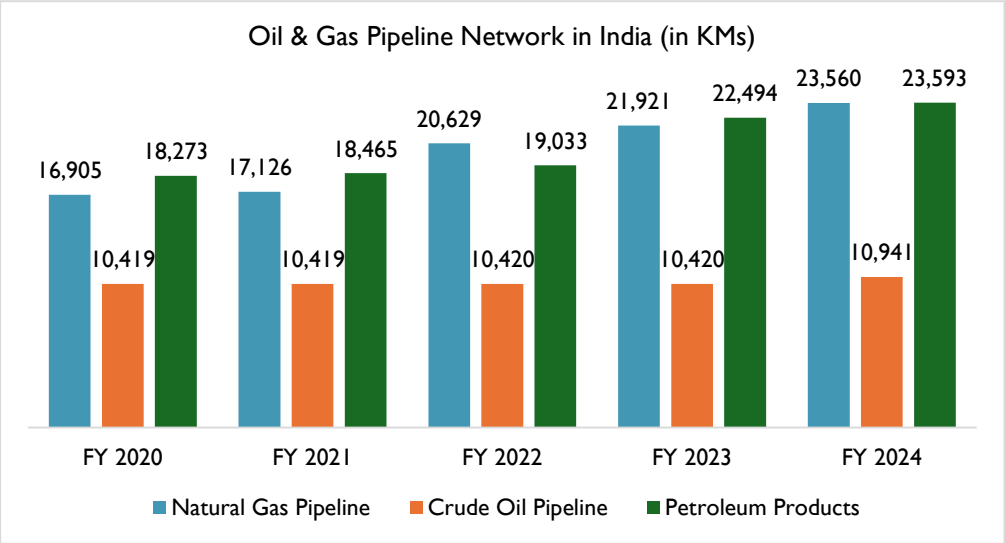
Source: Petroleum Planning & Analysis Cell

India's high import dependency renders the country's economy vulnerable to international crude oil market dynamics. Consequently, to insulate the domestic economy from external shocks and conserve forex reserves, the government is working towards increasing domestic E&P (Exploration & Production), to reduce import gradually. The government envisages to cut India's oil import dependence by 50% by 2030.

Oil & Gas pipeline network in India[12]

India's oil and gas pipeline network is a vital component of its energy infrastructure, ensuring efficient transportation of crude oil, refined petroleum products, and natural gas across the country. This network supports industrial activities and provides energy security to meet the demands of a rapidly growing economy.

[12] Ministry of Petroleum & Natural Gas



Source: Petroleum Planning & Analysis Cell

The Indian government has undertaken key projects to expand this network, including the Pradhan Mantri Urja Ganga Project, which aims to develop the natural gas infrastructure in eastern India, and the North-East Gas Grid, which seeks to integrate the northeastern states with the national gas grid. The broader National Gas Grid initiative aims to create a unified pipeline network, enhancing the availability of natural gas nationwide and promoting cleaner energy usage.

Prospects for India's oil and gas pipeline network are promising, driven by increasing energy demand, supportive government policies, and the push for cleaner energy sources. The expansion of this network is expected to improve energy security, reduce transportation costs, and support the country's transition to a more sustainable energy mix. Continuous investments and technological advancements will further enhance the efficiency and reliability of India's oil and gas transportation infrastructure, contributing significantly to the nation's energy sector growth and development.

Chemical and Fertilizer Industry

The chemical and fertilizer industry depends on structured steel to build durable and corrosion-resistant equipment essential for operations. Applications include storage tanks, pipelines, and specialized production equipment, particularly in fertilizer plants that produce ammonia. Structured steel ensures the creation of safe and long-lasting infrastructure capable of withstanding the corrosive environments often associated with chemical processing.

Performance Snapshot of Indian Chemical Industry

The Indian chemical industry stands as a dynamic and pivotal sector, boasting a remarkable diversity with over 80,000 commercial products. Globally, India holds the rank of being the 6th largest producer of

chemicals and the 3rd largest in Asia, showcasing its robust presence on the international stage. In terms of economic impact, the chemicals and chemical products sector have demonstrated a steady growth trajectory, contributing 1.5% to the Gross Value Added (GVA) for all economic activities in 2021-22 up from 1.42% in the previous year while to manufacturing sector it contributed 8.2% share against 8.1%, respectively. This upward trend shows the industry's resilience and significance within the broader economic landscape. Furthermore, FDI inflows into the Chemicals sector (excluding fertilizers) have soared to USD 22.9 billion from April 2000 to September 2024, reflecting robust investor confidence and global interest in India's flourishing chemical industry.

Chemical Production in India[13]

India's chemical and petrochemical industry is witnessing rapid growth, driven by rising domestic demand, policy support, and increasing global competitiveness. In 2023, India's total chemical production reached 903,002 metric tons, while petrochemical production stood at 1,877,907 metric tons, reflecting an 8.5% growth over 2022. With a 16-18% share in global dyestuff and dye intermediate production, India's exports in this segment totaled USD 1.69 billion from April to December 2023. The composition of India's chemical total production is with polymers (39%) and alkali chemicals (28%) being the dominant segments. Other key contributors include synthetic fibres (13%), organic chemicals (6%), and performance plastics (5%), while dyes & pigments, pesticides, elastomers, and inorganic chemicals hold smaller shares, indicating a balanced yet polymer-heavy industry structure. The Interim Union Budget 2024-25 allocated Rs. 192.21 crore (USD 23.13 million) to the Department of Chemicals and Petrochemicals. This investment is intended to introduce a Production-Linked Incentive (PLI) scheme for the chemical and petrochemical sector and revamp PCPIR guidelines, aiming to attract USD 284 billion (Rs. 20 lakh crore) in investments by 2035. The PCPIR framework is strategically designed to promote large-scale industrial clusters and drive exponential growth in the sector.

Additionally, India is making strides in petrochemical production. On September 14, 2023, Prime Minister Narendra Modi laid the foundation stone for development projects worth over Rs. 50,700 crore (USD 6.11 billion) in Bina, Madhya Pradesh. These refineries will produce around 1,200 Kilo-Tonnes Per Annum (KTPA) of ethylene and propylene, crucial raw materials for textiles, packaging, pharmaceuticals, and other industries.

India is also making significant moves in sustainable and green chemical production. For instance:

[13] https://www.indiaconnected.co.uk/industries/chemical-industry-india/

- **NTPC Renewable Energy Limited (NTPC REL) and Gujarat Alkalies and Chemicals Limited (GACL) signed an MoU in July 2022 to establish India's first commercial-scale Green Ammonia and Green Methanol plants.**
- **Between August 2021 and August 2022, India sold 3.27 crore bottles of nano urea, with production plans set to reach 6 crore bottles by the end of FY22-23.**

Vision for 2034: Strengthening Domestic Production

The Indian chemicals industry is poised for a period of robust growth and expansion in the coming years. With a diverse range of products, the industry is well-positioned to capitalize on increasing domestic and international demand. Factors such as favorable government policies, investments in research and development, infrastructure development, and technological advancements are expected to drive this positive trajectory. The Government of India has outlined a vision for 2034 to enhance domestic production, reduce import dependence, and attract foreign investments in the chemicals and petrochemicals sector. This roadmap includes implementing a production-linked incentive system (PLI) with 10-20% output incentives for the agrochemical sector and establishing manufacturing clusters for an end-to-end production ecosystem.

According to a report by Mckinsey, India is projected to reach a market size of USD 850-1000 billion in the chemicals sector by 2040, capturing a 10-12% share of the global market from USD 120-180 billion in 2021. The country is expected to play an increasingly prominent role in both consumption and manufacturing on the global stage. Recent shifts in geopolitical dynamics have prompted many nations to prioritize domestic self-sufficiency and localized supply chains. India's manufacturing competitiveness, when compared to other major global chemical hubs, indicates a strong foundation that could position India as a key chemical manufacturing hub in the future. The promising growth prospects for Indian chemical industry presents a favorable demand scenario for Structural Steel consumption growth.

Regulatory Landscape

The iron and steel industry plays a strategic position in the overall economic development. Therefore, the government has been taking sustained initiative every year towards the development of industry. There is no government-restricted production and sale of steel products, and this has immensely helped in the development of the domestic manufacturing sector. Foreign investment norms have helped the country attract global steel manufacturers who bought in improved manufacturing technology and processes. Currently 100% FDI under automatic route is allowed in the steel sector.

In India, the Ministry of Steel oversees policies related to steel production and usage. While specific guidelines on structural Structural Steel processes may not be detailed on their official website, the Bureau

of Indian Standards (BIS) provides standards and codes that govern Structural Steel practices in the country.

The proposal to provide additional depreciation of 20% against 10% on new plant and machinery installed by a manufacturing unit if the asset is installed after 30th Sep 2015 is a favorable move to boost investment in new plants and machinery in the steel industry.

- **Mines and Minerals (Development and Regulation) Act, 1957:** This act is pivotal in regulating the mining of raw materials such as iron ore and coal, which are essential for steel production. It establishes rules for the allocation of mining leases, ensures sustainable extraction practices, and aims to prevent illegal mining activities. The act also outlines guidelines for environmental protection and rehabilitation of mined areas.
- **Indian Steel Policy of 2017:** This policy is a comprehensive roadmap for the development of the steel industry in India. It focuses on increasing the domestic production of steel, reducing imports, and enhancing the sector's global competitiveness. The policy aims to achieve these goals by promoting investment in infrastructure, technology modernization, and research and development. It also emphasizes the importance of skill development and job creation in the sector.
- **Environmental Regulations:** Environmental protection is a crucial aspect of the regulatory framework for the iron and steel industry. The Environment Protection Act, 1986, along with other environmental laws and regulations, sets stringent standards for air and water pollution control, waste management, and conservation of natural resources. Steel plants are required to obtain environmental clearances and comply with emission norms to minimize their environmental footprint.
- **Quality Standards and Certification:** The Bureau of Indian Standards (BIS) is responsible for setting quality standards for steel products in India. These standards cover various parameters such as composition, strength, and durability to ensure the safety and reliability of steel used in construction, manufacturing, and infrastructure projects. Compliance with BIS standards are mandatory for steel manufacturers, and certification is often required for products to enter the market.
- **Government Oversight and Support:** The Ministry of Steel plays a central role in coordinating and implementing policies and programs for the steel industry. It collaborates with other government agencies, industry associations, and stakeholders to address challenges and promote growth. Additionally, the government provides various incentives, subsidies, and tax benefits to encourage investment, innovation, and technology adoption in the sector.

National Steel Policy 2017

This policy was initiated with the intention to create a technologically advanced and globally competitive steel industry that promotes economic growth. Its mission is to provide environment for attaining self-sufficiency in steel production in India. It is an updated version of National Steel Policy 2005.

Objective: The goal of the National Steel Policy is to foster a steel industry that can compete on a global scale. By 2030-31, it aims to boost per capita steel consumption to 160 kgs from the current level of about 63 kgs. Additionally, the policy seeks to fulfill all domestic demands for high-grade automotive steel, electrical steel, special steels, and alloys for strategic purposes by 2030-31. It also aims to enhance the availability of domestically washed coking coal to decrease reliance on imported coking coal from 85% to 65% by 2030-31.

Key Features of National Steel Policy:

- **Steel Demand:** The current GDP growth rate suggests that steel demand is projected to accelerate, reaching 230 million metric tons by 2030-31. To boost this demand, the Ministry has pinpointed construction and manufacturing sectors such as rural development, urban infrastructure, roads & highways, and railways as the primary areas of focus.
- **Steel Capacity:** It is anticipated that a crude steel capacity of 300 million metric tons will be needed by 2030. Achieving this will require a substantial capital investment of approximately Rs. 10 lakh crores by 2030-31 and is expected to generate significant employment, increasing from the current 2.5 million jobs to around 3.6 million jobs by 2030-31, depending on the level of automation and the adoption of various technologies.
- **Raw Material, Land, Water, and Power:** The Policy outlines several measures to ensure the availability of raw materials such as iron ore, coking coal, non-coking coal, natural gas, ferroalloys, and nickel at competitive rates. To achieve the target, an estimated 91,000 acres of additional land will be required for greenfield expansion. The Ministry will ensure the timely provision of litigation-free land, water, and power to the industries. Additionally, water conservation at all levels will be promoted, and the industry's efforts in this area will be supported.
- **Infrastructure and Logistics:** To meet the growing industry needs, adequate and timely infrastructure development must be pursued in Odisha, Chhattisgarh, and Jharkhand. This includes enhancing railways, roadways, power generation and distribution, evacuation infrastructure, slurry pipelines, and conveyors. To foster export opportunities and enhance competitiveness, the Government of India is also considering port-led development of steel clusters under the Sagarmala program.

Steel Quality Order Control

The quality of steel in India is regulated by the Steel and Steel Products (Quality Control) Order, 2024, issued by the Ministry of Steel in February 2024. This order replaces the previous 2020 version and establishes updated standards for steel production, certification, and distribution. The primary objective is to ensure high-quality steel products in the Indian market, in line with international standards, and to protect public safety. By emphasizing quality control, this order prevents substandard steel from entering the market, thereby promoting public safety, and ensuring the reliable performance of steel products in infrastructure, construction, and various industrial applications. During 2012-2024 (till date), the Government notified 151 carbon steel, alloy steel, and stainless-steel products to make available quality steel for the sectors mainly in construction, infrastructure, automobile, and engineering applications. The order achieves this through:

- **Specified Steel Products:** The order applies to a specific list of steel products outlined in Schedule 1. These products must comply with the relevant Indian Standards for composition, mechanical properties, and dimensions.
- **BIS Certification:** The Bureau of Indian Standards (BIS) is responsible for certification under the order. Steel products must be manufactured by a BIS-certified producer and accompanied by a Test Certificate with the Standard Mark. This ensures traceability and adherence to quality standards throughout the supply chain.
- **Certification Schemes:** The order outlines various certification schemes depending on the steel product category. Some products require mandatory Standard Marks from BIS, while others might have alternative assessment procedures.

Domestically Manufactured Iron and Steel Policy

The Domestically Manufactured Iron & Steel Products (DMISP) Policy, launched by the Indian government on 8th May 2017, prefers the domestically manufactured iron & steel products in Government procurement. To align with the Government "Atmanirbhar Bharat" scheme prioritizes the use of Indian-made iron and steel products in government projects. The Ministry of Steel has extended the DMISP policy by six months, going beyond the previous deadline which was 22nd May 2024. So far (till the end of 27th March 2023), the Policy has led to the procurement of Rs 34,808 Crore worth of steel which indicates increasing usage of domestic steel in government procurement thereby contributing to creating more job opportunities and strengthening the overall economy.

Objective:

- **Aligning with Make in India:** The policy falls under the umbrella of the "Make in India" initiative, aiming to reduce dependence on imported steel and stimulate domestic manufacturing. This fosters self-reliance and boosts the Indian economy.
- **Enhancing Quality Standards:** By mandating a minimum 15% value addition in procured steel, the policy encourages the use of superior quality products. This value addition could involve processing, further manufacturing, or specific treatments to enhance the steel's properties. The Ministry of Steel holds the discretion to review this criterion for better flexibility.
- **Nation Building Through Steel**: A robust domestic steel sector contributes significantly to India's infrastructure development and overall economic growth. DMISP aims to create a thriving steel ecosystem that supports nation-building efforts.

Waivers and Exceptions:

The policy acknowledges situations where domestic production might not fulfill project requirements. Here's when waivers can be granted:

- **Unavailability of Specific Steel Grades:** If a project necessitates a particular steel grade not currently manufactured domestically, a waiver can be obtained to procure it from international sources.
- **Production Shortfalls:** When domestic steel production capacity cannot meet the project's specific quantity needs, a waiver allows for import to bridge the gap.

Implementation and Oversight:

- **Ministry of Steel's Role:** The Ministry of Steel shoulders the responsibility of overseeing the policy's effective implementation. They may issue clarifications, revise criteria, and ensure compliance across government agencies.
- **Obligations of Government Agencies:** Every government department and PSU involved in procurement is mandated to adhere to the DMISP guidelines. This ensures that preference is given to qualifying domestic steel products in their tenders**.**

Production Linked Incentive (PLI) Scheme for Specialty Steel:

The Production Linked Incentive (PLI) Scheme for Specialty Steel, launched in July 2021 and further expanded with PLI Scheme 1.1 on January 6, 2025, reflects the Indian government's commitment to self-reliance (Atmanirbharta) in specialty steel production. The initiative aims to boost domestic manufacturing of high-value steel grades, foster technological advancements, and reduce dependence on imports.

Performance of the First Phase

Under the first round, launched in 2021, 44 projects by 26 companies are operational, with a committed investment of INR 27,106 crore and the creation of 24 million tons of downstream capacity. As of November 2024, actual investments have reached INR 18,300 crore, generating 8,300 direct jobs. Incentive payouts for participants are estimated at INR 2,000 crore.

Key Features of PLI Scheme 1.1

PLI Scheme 1.1 implemented in January 2025, introduces crucial reforms to attract greater industry participation. With a budgetary allocation of INR 6,322 crore (USD 737.45 million), the scheme covers five major product categories: Coated/Plated Steel Products, High Strength/Wear-Resistant Steel, Specialty Rails, Alloy Steel Products and Steel Wires, and Electrical Steel. These categories cater to diverse sectors, including automobiles, white goods, power transformers, and niche industrial applications.

Key updates in the scheme include:

- Reduced Threshold for CRGO Production: Investment and capacity creation requirements for Cold-Rolled Grain-Oriented (CRGO) steel is reduced to INR 3,000 crore and 50,000 tonnes, respectively. This measure aims to encourage domestic production of CRGO, a critical input for power transformers.
- Carry Forward of Surplus Production: Companies can carry forward excess production to offset shortfalls in subsequent years, ensuring consistent eligibility for incentives.
- Inclusion of Existing Capacity Augmentation: Firms investing in enhancing existing facilities are eligible under the scheme, with relaxed investment thresholds at 50% of the standard requirements.
- Implementation and Expected Outcomes
- The scheme will be implemented from FY 2025-26 to FY 2029-30. Investments made after January 6, 2025, are eligible, encouraging immediate action from industry. The initiative aligns with India's objectives of reducing imports, generating employment, and positioning itself as a global steel powerhouse.

The PLI scheme for specialty steel has been pivotal in bringing attention to the need for self-reliance in specialty steel production. By reducing import dependency, driving innovation, and ensuring sustained industry growth, the scheme is set to play a transformative role in India's steel sector and broader industrial landscape.

Other Government Measures:

Trade Barriers / Protective Measures

The Indian government has implemented several trade barriers and protective measures to support the domestic steel industry. One such measure is the Steel Import Monitoring System (SIMS), which requires importers to provide advanced information about intended steel imports. This system helps gather detailed data on end-use, grade, and technical specifications. Additionally, the government has increased import duties on most steel items by 2.5% on two occasions. Furthermore, anti-dumping and safeguard duties have been imposed on steel items to protect the domestic industry from unfair trade practices. These trade barriers aim to safeguard and promote the domestic steel sector in India.

Revamped Steel Import Monitoring System (SIMS) 2.0

The launch of the revamped Steel Import Monitoring System (SIMS) 2.0 on July 25, 2024, aims to enhance the monitoring of steel imports, addressing the concerns of domestic steel producers. The upgraded SIMS provides detailed insights into the standards and grades of steel being imported, enabling data-driven policymaking to counter potential import surges. Data collected through the SIMS portal is published bi-weekly on the Ministry of Steel's website, ensuring transparency. The integration of SIMS with the ICEGATE portal of CBIC is underway to streamline import tracking further. The revamped system is expected to have a measurable impact on protecting domestic industry interests and maintaining market balance, with its effectiveness likely to be fully assessed after one year of implementation.

Government Policies & Initiatives – Boosting Steel Industry

Government schemes and initiatives such as the National Infrastructure Pipeline (NIP), Atmanirbhar Bharat, Production Linked Incentives (PLI), PM Gati Shakti - National Master Plan, and National Manufacturing Policy are creating a substantial demand for steel and steel products in the country. Moreover, the current government's emphasis on infrastructure through the Atal Mission for Rejuvenation and Urban Transformation, Smart Cities, Mass Rapid Transport System, Affordable Housing, Jal Jeevan Mission, etc., and increasing budgetary allocation towards infrastructure are also creating a significant demand for steel and stainless-steel products in the country.

Union Budget 2025-26 Announcement

The budget includes several benefits that include the removal of the 2.5% basic customs duty on ferronickel, a crucial raw material for stainless steel and specialty alloys, and introduces zero BCD on 25 critical minerals, including molybdenum, used in high-grade steel production. The exemption of BCD on ferrous scrap has been extended till March 31, 2026, encouraging recycling and reducing reliance on raw ore.

Reduction of Custom Duty in the Steel Sector	From	To (As of Union Budget 2024-2025)
Ferro Nickle	2.5%	Nill
Ferrous Scrap	Nil (till 30.09.2024)	Nil (till 31.03.2026)
Certain specified raw materials for the manufacture of CRGO steel.	Nil (till 30.09.2024)	Nil (till 31.03.2026)

Union Budget 2025-26 & Infrastructure Sector Announcement

Roads and Highways

The capital expenditure allocation for the Ministry of Road Transport and Highways remains unchanged at INR 2.72 trillion for FY26 (BE), compared with FY25 (RE)

- The allocation towards the National Highways Authority of India remains almost flat at INR 1.7 trillion for FY26 (BE), compared with FY25 (RE).
- The allocation towards Pradhan Mantri Gram Sadak Yojna has been raised to INR 190 bn for FY26 (BE), from INR 145 bn in FY25 (RE).
- The top 50 tourist destinations sites in the country will be promoted and connectivity to these destinations will be facilitated, including land acquisition for building key infrastructure such as roads.

Railways

- Capital expenditure for Indian Railways remains unchanged at INR 2.52 trillion for FY26 (BE), compared with FY25 (RE).
- The allocation towards new railway lines has been set at INR 322 billion for FY26 (BE), from INR 315 billion in FY25 (RE).

Urban Infrastructure

- In the Union Budget 2025-26, the government announced the setting up of an Urban Challenge Fund worth INR 1 trillion to implement the proposals for "cities as growth hubs", "creative redevelopment of cities", and "water and sanitation". For this, the budget allocated has proposed allocation of INR 100 Billion for the year FY 2026.
- The allocation towards Pradhan Mantri Awas Yojna (PMAY) - Urban has been raised to INR198 billion for FY26 (BE), from INR 137 billion in FY25 (RE)

- The allocation towards Pradhan Mantri Awas Yojana - Urban 2.0 (PMAY-U 2.0) has been increased to INR 35 billion for FY26 (BE), from INR 15 billion in FY25 (RE).

River and Water Infrastructure

- The total allocation for the ministry of Jal Shakti was set at INR 253 billion for FY26 (BE), compared with INR 216 billion in FY25 (RE).
- The allocation towards Interlinking of Rivers was raised to INR 24 billion for FY26 (BE), from INR 20 billion in FY25 (RE). The Union Budget has announced support for the Western Koshi Canal Project in the Mithilanchal region of Bihar. This is expected to benefit farmers cultivating over 50,000 hectares of land.
- The Union Budget has announced the promotion of infrastructure facilities for the creation of shipbuilding clusters to increase the range, categories and capacity of ships.

Digital Infrastructure

- The Union Budget has announced a substantial increase in allocation towards National Urban Digital Mission (NUDM) to INR12 billion for FY26 (BE), from just INR 1 billion in FY25 (RE).
- The allocation towards New ITI Upgradation Scheme has been increased to INR 30 billion for FY26 (BE), from just INR 3 billion in FY25 (RE).
- The Union Budget has announced the launch of a digital public infrastructure called 'BharatTradeNet' to complement the Unified Logistics Interface Platform. This will act as a unified platform for trade documentation and financing solutions.
- The Union Budget has also committed to provide broadband connectivity to all government secondary schools and primary health centres in rural areas under the 'Bharatnet' project.

Infrastructure Financing

- The allocation towards National Investment and Infrastructure Fund (NIIF) has been doubled to INR 30 billion for FY26 (BE), from INR 15 billion in FY25 (RE).
- Public-Private partnerships for infrastructure will be encouraged, and each infrastructure-related ministry is expected to come up with a 3-year pipeline of projects. States can seek support from the India Infrastructure Project Development Fund (IIPDF) to this end.
- The Union Budget has announced continued support to states for capital expenditure related to infrastructure via an outlay of INR 1.5 trillion on 50-year interest free loans.

- The Union Budget has given a five-year extension (till 31 March 2030) for infrastructure investments made by Sovereign Wealth Funds and Pension Funds in the infrastructure sector.

While the 10% increase in infrastructure might seem modest but it reflects a deliberate push to incentivize public-private partnership (PPP) models, particularly at the state level through the Infrastructure Investment Development Fund (IIDF), aimed at improving the speed and efficiency of infrastructure projects. On the physical infrastructure front, the Ministry of Roads and Highways has shifted its focus from a project-based to a corridor-based approach, aligning with the government's tourism promotion strategy. The second asset monetization plan, which spans from 2025 to 2030, further supports this effort by reinvesting proceeds from up to Rs 10 tn worth of government-owned assets into new infrastructure projects.

Threats And Challenges

The Structural Steel industry in India faces various challenges and threats that can significantly impact its growth, competitiveness, and sustainability. These challenges stem from both domestic and global factors. Below are the key threats and challenges specific to the Structural Steel sector in India:

Raw Material Supply and Price Fluctuations

The cost of key raw materials such as iron ore, coal, and steel scrap can fluctuate significantly due to changes in global supply and demand, trade policies, and geopolitical tensions. The volatility in raw material prices affects production costs and profit margins for Structural Steel fabricators. India is reliant on imports for a significant portion of steel scrap and alloying materials, which makes the industry vulnerable to international supply chain disruptions, currency fluctuations, and trade restrictions.

Competition from Low-Cost Producers

China, with its massive steel production capacity and lower manufacturing costs, is a significant threat to the Indian Structural Steel industry. The influx of cheap imports from countries like China can undercut prices in the domestic market, reducing demand for locally produced Structural Steel. The relatively higher cost of manufacturing in India, due to higher labor and energy costs, makes it challenging for Indian manufacturers to compete with global low-cost producers while maintaining quality.

Skilled Labor Shortage

The Structural Steel industry in India suffers from a shortage of skilled labor, especially in advanced fabrication techniques, machinery operations, and digital tools for structural design and production. This shortage hampers productivity and can result in lower-quality products. With a significant gap in training and development, the sector requires greater investment in workforce development programs to meet the demand for technically skilled professional's adept at operating automated machinery, robotics, and modern fabrication techniques.

Environmental Regulations and Sustainability

Structural Steel are energy-intensive and emit a substantial amount of carbon dioxide and other pollutants. As India moves towards increased environmental sustainability, the Structural Steel sector faces growing pressure to adhere to stricter environmental regulations. The transition to eco-friendly technologies, such as electric arc furnaces and low-emission production methods, necessitates significant investment, which may be difficult for smaller fabricators. Compliance with environmental standards can lead to increased operational costs, affecting the overall profitability of Structural Steel companies.

Technological Advancements and Innovation

Many Structural Steel engineering companies in India still rely on traditional production methods, limiting efficiency and product quality. The adoption of automation, robotics, and digitalization remains relatively slow in comparison to other global steel manufacturing hubs. Without sufficient investment in R&D for product innovation and process improvements, the Indian Structural Steel industry risks losing its competitiveness on the global stage. As digitalization, advanced manufacturing, and smart technologies become the standard, Indian fabricators must catch up to maintain relevance.

Infrastructure Deficiencies

Efficient transportation and logistics infrastructure are crucial for the smooth operation of the Structural Steel industry, yet India's infrastructure faces challenges. Problems like traffic congestion, inadequate road networks, and delayed shipping hinder the movement of raw materials and finished Structural Steel. The inadequate port infrastructure and rail network inefficiencies also contribute to increased costs and delivery delays, especially when dealing with bulk shipments or exporting Structural Steel abroad.

Fluctuating Domestic Demand

The demand for Structural Steel in India is highly dependent on various sectors like construction, infrastructure, and automotive. Any downturn in these industries, particularly during economic slowdowns, can lead to reduced demand for steel products. The cyclical nature of steel demand makes it difficult for manufacturers to plan production and inventory effectively. Economic recessions or unforeseen disruptions, such as the COVID-19 pandemic, can severely impact demand, disrupting both domestic and export markets for Structural Steel components.

Financial Constraints

While large steel manufacturers in India can access capital through loans or equity, smaller steel fabricators often face difficulties in securing affordable financing. Rising raw material prices, labor costs, and energy costs add additional pressure to the profit margins of fabricators. Smaller firms may struggle to raise the funds necessary to invest in modern machinery, skilled workforce development, or technological upgrades, thus limiting their ability to compete with larger, more established players in the market.

Government Policy and Regulatory Uncertainty

While the Indian government has introduced several policies to support the steel industry (such as the National Steel Policy and Make in India), inconsistent or delayed policy implementation can create uncertainty in the business environment for Structural Steel manufacturers. Changes in trade policies,

tariffs, and regulatory measures may affect the cost and availability of raw materials, as well as the export opportunities for Indian Structural Steel. Protectionist measures in other countries can also affect India's access to global markets, impacting the competitiveness of domestic manufacturers.

Geopolitical Risks

Geopolitical tensions between major steel-producing countries like China, the U.S., and the EU can have a direct impact on global steel prices and trade flows. Any shifts in trade policies or tariff increases may disrupt India's ability to compete on the global market. Additionally, political instability in key regions (such as the Middle East) or global disruptions such as pandemics or natural disasters can create significant supply chain risks and further complicate the procurement of raw materials or delivery of Structural Steel products.

Supply Chain Disruptions

The COVID-19 pandemic highlighted the vulnerability of global supply chains. Structural Steel companies in India rely on the timely delivery of raw materials and components to meet production deadlines. Any disruption in the supply chain, such as transport strikes, natural disasters, or pandemics, can delay production and delivery. Global shortages in essential materials like steel scrap or alloying agents during periods of high demand can lead to material shortages, impacting the manufacturing process and increasing overall costs.

High Energy Consumption and Costs

Steel fabrication is an energy-intensive process, and the rising energy prices place significant pressure on the industry's profitability. India's reliance on fossil fuels for energy generation increases vulnerability to rising energy costs, further impacting operational costs for Structural Steel engineering companies. The industry requires significant investment in energy-efficient technologies and the adoption of renewable energy sources to reduce costs and meet global sustainability standards. However, these steps are costly, and small players in the industry may struggle to make these transitions.

In conclusion, the steel structural industry in India faces a complex array of challenges that require a coordinated response from industry stakeholders, policymakers, and businesses themselves. Addressing these issues—particularly around raw material volatility, skilled labor shortages, and technological innovation—will be key to ensuring the sector's growth and competitiveness in the long run.

Competitive Landscape

The Indian heavy Structural Steel industry is a vital segment of the country's infrastructure and industrial development, driven by rapid urbanization, large-scale infrastructure projects, and industrial expansion. This sector plays a crucial role in supporting key industries such as construction, power, oil and gas, refineries, transportation, and manufacturing. The market is characterized by a mix of established players, emerging companies, and expansion projects, creating a highly competitive environment. While Mumbai and Kolkata remain major hubs for heavy Structural Steel businesses, Chennai and other industrial regions also contribute significantly to the industry.

Despite the strong demand, the industry faces intense competition due to low entry barriers and the presence of numerous domestic and international players. Additionally, alternative materials such as aluminum and concrete pose a challenge in certain applications, driving the need for continuous innovation and material efficiency. Companies involved in heavy Structural Steel must navigate challenges such as fluctuating raw material prices, supply chain disruptions, and evolving environmental regulations.

However, the sector also presents significant growth opportunities, supported by government initiatives such as Make in India, Smart Cities Mission, and large-scale infrastructure projects like highways, metro rail, high-speed rail corridors, and renewable energy expansion. To remain competitive in this dynamic landscape, companies specializing in heavy Structural Steel must focus on advanced engineering solutions, precision manufacturing, and the integration of high-strength materials like E250, E350, E450, and Hardox steel. Investing in modern technology, automation, and sustainable practices will be key to ensuring efficiency, cost-effectiveness, and long-term success in the evolving Indian heavy Structural Steel industry.

Key Factors Shaping the Competition

The competition in the Structural Steel market in India is influenced by several key factors, including rising demand for pre-engineered buildings, government initiatives for infrastructure development, and the increasing importance of green building construction. The competition in India's structural Structural Steel industry is influenced by several key factors:

- **Domestic Demand and Infrastructure Development:** The government's focus on infrastructure projects, including housing, electrification, and water supply, is expected to drive steel consumption. This surge in demand presents opportunities for the steel industry to expand its capacity and meet the growing needs of the construction sector. Mainly demand for pre-engineered buildings (PEB) is growing due to their cost benefits and reduced construction time compared to traditional models. PEBs are also more environmentally friendly, with steel

production methods that reduce greenhouse gas emissions and components that are highly recyclable.

- **Import Competition:** The influx of inexpensive Chinese steel imports has intensified competition for Indian manufacturers. Chinese steel, often sold at lower prices, has led to reduced capacity utilization and financial challenges for local producers, particularly small and medium-sized mills.
- **Availability of Raw Materials**: India has abundant iron ore reserves, making it competitive in the global steel market. The easy availability of low-cost manpower also contributes to the competitiveness of the industry.
- **Technological Advancements:** Adopting advanced manufacturing technologies and automation is crucial for improving productivity and efficiency. Benchmarking against global standards can help Indian manufacturers enhance their competitiveness in the global market. Advancements in technology, such as CNC (Computer Numerical Control) fabrication and pre-engineered fabrication methods, enhance precision and efficiency. These innovations allow for faster production and higher quality, giving a competitive edge to companies that adopt them.
- **Policy and Regulatory Environment:** Government policies, including trade regulations, tariffs, and safety guidelines, significantly impact the steel industry's competitiveness. Adherence to safety standards and environmental regulations is essential for sustainable growth.
- **Market Dynamics and Export Opportunities:** The ability to tap into export markets and diversify product offerings can provide a competitive advantage. However, challenges such as fluctuating global demand and trade barriers can affect export performance.

  Addressing these factors through strategic planning, technological innovation, and supportive policies is essential for enhancing the competitiveness of India's structural steel industry.

Profiling of the peer Companies

Goodluck India Limited

Goodluck India Limited, established in 1986, is a one of the prominent Indian manufacturers specializing in a diverse range of steel products. The company manufactures wide array of industrial steel products, including ERW Steel Pipes (available in black, red-painted, and galvanized finishes) for construction and industrial use, Hollow Sections for building frameworks, CR Coils and Sheets for the automotive and engineering sectors, and CDW Tubes for precision applications.

The company's engineering structure & precision fabrication manufactures wide range of products such Railway bridges & girders, Launching Girders, Technology structures for solar sector including structure for solar module installation, Structures for roads & bridges and Primary & Secondary structures for boilers & turbine generators. hey also produce Telecom Towers, Transmission Line Towers, and Road Safety Equipment, all aimed at supporting infrastructure development and ensuring safety. Additionally, Goodluck offers comprehensive Precision Forgings and Metal Forging Solutions tailored for industries such as automotive, oil and gas, aerospace, and heavy machinery.

Goodluck India Limited serves a variety of clients, including Lucknow Metro Rail Corporation, NTPC, NCC Limited, and Ashoka Buildcon Ltd, among others. The company operates with 6 manufacturing facilities are spread across India including five in Uttar Pradesh and one in Gujarat. Goodluck India Limited has a capacity of over 4,12,000 MTPA and exports it's product to over 100 countries.

Salasar Techno Engineering Limited

Salasar Techno Engineering Limited, established in 2006, is a prominent Indian infrastructure company specializing in customized steel fabrication and EPC (Engineering, Procurement, and Construction) solutions. Initially, focused on tower manufacturing, the company has expanded its offerings to address the infrastructural needs of a rapidly developing nation.

Salasar's product portfolio includes telecommunication towers, power transmission line towers, substation structures, solar module mounting structures, smart city poles, high masts, utility poles, guard rails, cable trays, and both galvanized and non-galvanized customized Structural Steel. Under the Heavy Structural Steel, the company manufactures fabricated structure for building, bridges and heavy and complex structures for industrial plants including Thermal Power plants, Steel plants, Cement plants, and Petrochemical Plants.

The company has successfully supplied over 50,000 telecom towers and has exported its products to more than 25 countries. Salasar boasts an annual production capacity of over 110,000 metric tons, along with 500+ kilometers of power transmission lines and more than 400 kilometers of railway track electrification across India.

Salasar partners with various clients, including HFCL Group, UPPTCL, Indus Tower, American Tower Corporation, and India Telecom Industries, among others. Operating in two primary segments—Structural Steel and EPC—Salasar manufactures and deploys a diverse range of Structural Steel for the telecom, transmission, solar, and railway electrification sectors.

Atmastco Limited

Atmastco Limited, founded in April 1994, is a leading Indian engineering company that specializes in the design, manufacturing, and supply of precision equipment and heavy structural fabrication for various industrial sectors. The company offers a diverse range of products, including heavy structural fabrication components such as ceiling and railway girders, columns, bracings, and pressure ducts. Atmastco also provides Turnkey Engineering, Procurement, and Construction (EPC) services, managing projects across sectors such as power, energy, steel, cement, railways, water treatment, and refineries.

The company works with numerous clients, including IRSO, BHEL, DRDO, SAIL, Tata Steel, and Adani. Additionally, Atmastco manufactures defense equipment, including bulletproof jackets and ballistic helmets, for India's defense services. Located in Durg, Chhattisgarh, Atmastco plays a significant role in contributing to the infrastructure and defense sectors in India. The company has an annual production capacity of over 24,000 metric tons and operates on more than 40 acres of land with six bays dedicated to steel fabrication, managing over 80 finished orders across its capacity.

Financial Benchmarking for Key Players:

Goodluck India Limited

Indicator (INR Millions)	FY 2022	FY 2023	FY 2024
Revenue	26,132.13	30,720.08	35,247.76
Raw material cost	19,184.92	23,215.77	23,215.77
Power & Fuel cost	885.77	1,210.00	1,200.87
Employee cost	965.99	1,258.85	1,516.38
Interest cost	511.18	596.68	681.60
EBITDA	1,806.58	2,133.18	2,858.70
EBITDA Margin	6.9%	6.9%	8.1%
PAT	750.11	878.01	1,322.68
PAT Margin	2.9%	2.8%	3.7%
Debt Equity Ratio	0.25	0.15	0.09
Interest Coverage Ratio	3.53	3.58	4.19
Return on Assets	6.0%	6.0%	6.5%
Current Ratio	1.35	1.42	1.93

Source – Annual Reports

Goodluck India Limited has demonstrated strong growth in revenue and profitability from FY 2022 to FY 2024, with revenue increasing from INR 26,132.13 million to INR 35,247.76 million, registering a y-o-y growth of 18% and 15% in FY 2023 and FY 2024, respectively. EBITDA rose significantly to INR 2,858.70 million in FY 2024, supporting a sharp increase in EBITDA margins to an impressive 8.1% in FY 2024 from 6.9% in FY 2022. PAT also increased steadily, reaching INR 1,322.68 million in FY 2024, with PAT margins improving to 3.7%.

The company successfully reduced its debt-equity ratio from 0.25 in FY 2022 to a low 0.09 in FY 2024, indicating enhanced financial stability. The interest coverage ratio improved to 4.19 in FY 2024, reflecting stronger earnings relative to interest obligations. The return on assets also improved slightly to 6.5%, reflecting better asset utilization. Additionally, the current ratio increased from 1.35 in FY 2022 to 1.93 in FY 2024, indicating stronger liquidity.

Salasar Techno Engineering Limited

Indicator (INR Million)	FY 2022	FY 2023	FY 2024
Revenue	7,188.62	10,048.95	12,084.26
Raw material cost	4,779.82	5,826.81	8,105.89
Power & Fuel cost	123.72	153.78	184.47
Employee cost	399.58	464.63	525.58
Interest cost	188.63	265.41	386.62
EBITDA	682.12	885.46	1,208.99
EBITDA Margin	9.5%	8.8%	10.0%
PAT	314.57	402.54	529.33
PAT Margin	4.4%	4.0%	4.4%
Debt Equity Ratio	0.15	0.10	0.09
Interest Coverage Ratio	3.62	3.34	3.13
Return on Assets	4.6%	4.4%	4.6%
Current Ratio	1.48	1.52	1.35

Source – Annual Reports

Salasar Techno Engineering Limited has demonstrated consistent growth in revenue and profitability from FY 2022 to FY 2024, with revenue increasing from INR 7,188.62 million to INR 12,084.26 million. EBITDA rose to INR 1,208.99 million in FY 2024, translating into EBITDA margins improving to 10.0% in FY 2024 from 9.5% in FY 2022. PAT also grew steadily, reaching INR 529.33 million in FY 2024, maintaining a PAT margin of 4.4%. The company successfully reduced its debt-equity ratio from 0.15 in FY 2022 to a low

0.09 in FY 2024, indicating enhanced financial stability. The interest coverage ratio slightly declined to 3.13 in FY 2024. The return on assets remained stable at 4.6%, reflecting consistent asset utilization. However, the current ratio decreased from 1.48 in FY 2022 to 1.35 in FY 2024, signaling a slight reduction in liquidity. Overall, the company's financial performance highlights steady growth, stable profitability, and improved financial stability.

Atmastco Limited

Indicator (INR Millions)	FY 2022	FY 2023	FY 2024
Revenue	936.12	2,419.51	2,240.06
Raw material cost	660.12	1,500.24	905.66
Power & Fuel cost	18.35	29.24	20.52
Employee cost	86.71	153.25	152.79
Interest cost	78.38	62.84	86.07
EBITDA	150.61	283.24	362.06
EBITDA Margin	16.1%	11.7%	16.2%
PAT	32.30	127.77	167.05
PAT Margin	3.4%	5.3%	7.4%
Debt Equity Ratio	0.44	0.48	0.23
Interest Coverage Ratio	1.92	4.51	4.21
Return on Assets	2.4%	5.4%	5.7%
Current Ratio	1.56	1.61	2.12

Source – Annual Reports

Atmastco Limited has demonstrated significant growth in revenue and profitability from FY 2022 to FY 2024. Revenue increased from INR 936.12 million in FY 2022 to a peak of INR 2,419.51 million in FY 2023, before stabilizing at INR 2,240.06 million in FY 2024. EBITDA reached INR 362.06 million in FY 2024, supported by the lower rate of increase in operating costs, and it improved from 16.1% in FY 2022 to 16.2% in FY 2024. Profit After Tax (PAT) also grew steadily, reaching INR 167.05 million in FY 2024, with PAT margins improving from 3.4% in FY 2022 to 7.4% in FY 2024.

The company successfully reduced its debt-to-equity ratio from 0.44 in FY 2022 to 0.23 in FY 2024, indicating enhanced financial stability. Additionally, the interest coverage ratio improved significantly from 1.92 in FY 2022 to 4.21 in FY 2024, reflecting better earnings concerning interest obligations. Return on

assets also increased from 2.4% in FY 2022 to 5.7% in FY 2024, demonstrating efficient asset utilization. Furthermore, the current ratio rose from 1.56 in FY 2022 to 2.12 in FY 2024, indicating stronger liquidity.

Financial Benchmarking of Key Players (2024):

Indicator for (INR Million)	Goodluck India Limited	Salasar Techno Engineering Limited	Atmastco Limited	Karbonsteel Engineering Limited
Revenue	35,247.76	12,084.26	2,240.06	2,183.38
Raw material cost	23,215.77	8,105.89	905.66	1,275.61
Power & Fuel cost	1,200.87	184.47	20.52	46.38
Employee cost	1,516.38	525.58	152.79	88.40
Interest cost	681.60	386.62	86.07	100.78
EBITDA	2,858.70	1,208.99	362.06	251.14
EBITDA Margin	8.1%	10.0%	16.2%	11.5%
PAT	1,322.68	529.33	167.05	94.19
PAT Margin	3.7%	4.4%	7.4%	4.3%
Debt Equity Ratio	0.09	0.09	0.23	0.45
Interest Coverage Ratio	4.19	3.13	4.21	2.49
Return on Assets	6.5%	4.6%	5.7%	5.2%
Current Ratio	1.93	1.35	2.12	1.31

Source – Annual Reports

The financial benchmarking of key players in FY 2024 highlights distinct performance metrics across the sector. Goodluck India Limited leads in revenue with INR 35,247.76 million, followed by Salasar Techno Engineering Limited at INR 12,084.26 million, Atmastco Limited at INR 2,240.06 million, and Karbonsteel Engineering Limited at INR 2,183.38 million. Goodluck India also achieves the highest EBITDA margin of 8.1%, showcasing superior operational efficiency, while Atmastco delivers a strong margin of 16.2%, followed by Karbonsteel at 11.5%.

Atmastco Limited leads in PAT margin at 7.4%, ahead of Salasar Techno's 4.4% and Karbonsteel's 4.3%, with Goodluck India at 3.7%. In terms of financial stability, both Goodluck India and Salasar Techno have the lowest debt-equity ratios of 0.09, indicating minimal leverage, while Karbonsteel has the highest ratio at 0.45, reflecting greater but comfortable reliance on debt. Atmastco has the highest interest coverage

ratio of 4.21, indicating strong earnings relative to interest obligations, followed by Salasar Techno at 3.13 and Goodluck India at 4.19.

Goodluck India shows efficient asset utilization with the highest return on assets at 6.5%, followed by Atmastco at 5.7%. Liquidity metrics reveal Atmastco with the strongest current ratio at 2.12, followed by Goodluck India at 1.93 and Karbonsteel at 1.31. Overall, Goodluck India excels in scale and operational efficiency, while Atmastco leads in profitability and liquidity.

Calculation Used:

PBT+Finance Cost+D&A	EBITDA
EBITDA/Revenue from Operation	EBITDA Margin
PAT	PAT
PAT/Total Income	PAT Margin
Long term Debt/Total Equity	Debt Equity Ratio
EBITDA/Interest Cost	Interest Coverage Ratio
PAT/Total Asset	Return on Assets
Current Assets/Current Liabilities.	Current Ratio

Growth forecast

The growth forecast for structural steel is promising, driven by increasing demand in infrastructure development, commercial construction, and industrial projects. As economies around the world continue to expand, the need for durable, high-quality steel for buildings, bridges, and industrial facilities is expected to rise. Technological advancements in fabrication methods, such as the use of CAD, BIM, and CNC machinery, are also enhancing the precision and efficiency of production, further boosting the market. Additionally, the growing trend toward sustainable construction practices, including the use of corrosion-resistant and energy-efficient steel, is likely to contribute to the continued growth of the structural steel sector.

The Indian steel structural market is growing quickly as the country's economic growth and infrastructure development are rising. The demand for metal-fabricated products in India is expected to increase further due to the government's ambitious plans for infrastructure development. The rising demand for goods and services across various sectors in India, along with the global manufacturing companies' focus on diversifying their production under China plus one strategy by setting up their plants in countries like India, is expected to drive the Indian manufacturing sector. As of 2024, the Indian manufacturing sector has shown remarkable progress toward achieving its 2025 goals, driven by robust government initiatives, and growing domestic and global demand. Valued at approximately USD 447.46 billion in annual exports, the sector contributes around 17% to the nation's GDP, demonstrating steady growth in industrial production and infrastructure development. According to the Index of Industrial Production (IIP), the manufacturing index witnessed a 4.6% growth in mid-2024 compared to the same period in 2023, reflecting its consistent expansion. Looking ahead, the sector is projected to grow at a compound annual growth rate (CAGR) of 4.8% between 2025 and 2030, with its contribution to GDP expected to rise to 21% by 2030. Additionally, India is targeting USD 1 trillion in manufacturing exports by 2030, highlighting its aspiration to become a global manufacturing hub. This growth is supported by strategic government initiatives such as "Make in India" and Production-Linked Incentive (PLI) schemes, which continue to drive investments, enhance technology adoption, and expand manufacturing capacities across various industries. This growth in the manufacturing sector in India is likely to lead to more manufacturing facilities in the country, which is expected to increase demand in the market studied.

Driven by growth in priority industries and favorable mega-strategies, the Indian manufacturing industry has expanded into new regions and market segments. Building on the advantages of a skilled labor force and low labor costs, the manufacturing industry is also benefitting from higher capital expenditure and

increased mergers and acquisitions (M&A) activity, resulting in an increase in manufacturing output and, hence, an increase in export contribution.

Considering the above development, heavy steel structural demand is expected to remain robust translating in increasing metal structured activity in the country to fulfill expanding demand from infrastructure projects and industrial projects. The expanding metal and manufacturing industries, expanding automotive and aerospace sectors, and rising R&D expenditures are expected to drive the Indian market for metal structural. The steel structural industry is also growing because of government policies that aid the industry.

Company Profile: Karbonsteel Engineering Limited

Karbonsteel Engineering Limited, incorporated in 2011 and based in Mumbai, India, is a leading provider of heavy Structural Steel engineering and fabrication solutions. The company has built a strong reputation for delivering high-quality, precision-engineered Structural Steel across infrastructure, industrial, and commercial sectors. Specializing in the fabrication of mild steel (MS), stainless steel (SS), and alloy products, Karbonsteel caters to industries such as steel manufacturing, refineries, solar energy, high-rise buildings, and more.

Karbonsteel's expertise lies in delivering engineering and fabricating solution for heavy Structural Steel and technical Structural Steel both of which are critical components in modern infrastructure and industrial applications. Karbonsteel Engineering works with a range of high-quality steel grades tailored to specific project requirements. E250, known for its moderate tensile strength and good weldability, is commonly used in general construction for beams and columns. E350 and E450, with higher tensile strength, are ideal for load-bearing structures that demand greater strength and durability. Hardox, a steel grade recognized for its exceptional wear resistance, is extensively used in industrial machinery subject to high wear and tear. Additionally, Galvanized Steel, with its zinc coating, offers long-term corrosion resistance, making it an optimal choice for outdoor structures exposed to harsh environmental conditions.

In the integration of heavy and technical Structural Steel within large-scale projects, Karbonsteel Engineering ensures that each component is tailored to meet precise specifications and design requirements. Material selection, such as using E250, E350 or Hardox is strategically determined based on the unique needs of each project to ensure optimal structural performance. For example, a bridge may incorporate E450 for its load-bearing girders while utilizing Galvanized Steel for corrosion-resistant components. Similarly, an industrial plant may use Hardox for machinery support and E350 for primary

structural frameworks. This meticulous approach allows Karbonsteel to deliver durable and high-performance structural solutions that meet industry standards and exceed client expectations.

With a deep commitment to quality, precision, and innovation, Karbonsteel continues to be a preferred choice for heavy and technical Structural Steel in India and beyond. The company's expertise in integrating advanced materials with precision engineering enables it to provide customized and high-performance solutions for some of the most demanding industrial and infrastructure projects.

Manufacturing Facilities

Karbonsteel Engineering Limited operates state-of-the-art manufacturing facilities in Umbergaon, Gujarat, and Khopoli, Maharashtra, strategically positioned to provide high-capacity production and top-notch quality control. The Umbergaon facility spans 7,60,492.12 square feet and boasts an installed capacity of 18,000 MT, with a capacity utilization of 15,458.42 MT as of March 31, 2024. This facility is equipped with advanced CNC cutting machines, including Plasma and Oxyfuel cutters, as well as cutting-edge rolling machines, enabling the precise handling of large-scale fabrication projects.

Meanwhile, the Khopoli facility covers 56,083.5 square feet, with an installed capacity of 6,000 MT and a capacity utilization of 3,909.87 MT as of March 21, 2024. It features CNC cutting (Plasma & Oxyfuel), Saw welding, FCAW, and GMAW technologies, making it ideal for efficient fabrication of complex structural steel. Additionally, this facility includes cutting areas, inspection zones, and EOT cranes to streamline its operations.

Both units are equipped with the latest machinery and rigorous testing facilities, ensuring high-quality standards and compliance with international norms. Karbonsteel's advanced manufacturing capabilities position it as a leader in the steel fabrication industry, consistently delivering precision-engineered, heavy, and technical structural steel.

Major Product profile

Karbonsteel Engineering is involved in heavy Structural Steel engineering, focusing on sequential delivery based on priority and exceptional quality, catering to diverse industrial and infrastructure needs. Karbonsteel has 65+ projects delivered and 1,00,00 MT+ delivered for fabricated Steel with having 2-unit locations such as Umbergaon (Gujarat) and Khopoli (Maharashtra) in India.

Product Offerings are as follows:

Heavy steel fabricated structures - Heavy steel fabricated structures are large steel components designed to support substantial loads and withstand operational stresses in industrial and infrastructure

projects. These structures form the core framework for various applications, including industrial plants, high-rise buildings, equipment support systems, bridges and other infrastructure projects. The common components of heavy steel fabricated structures include structural frameworks, columns, beams, crane girders, rafters, purlins, pipe racks, platforms, walkways, conveyor galleries, staircases, ladders and heavy-duty support structures. The fabrication process typically involves procurement of specific graded steel followed by cutting, drilling, bending, welding, machining, fit-up, assembly, surface treatment and protective coatings, ensuring compliance with applicable project specifications and quality standards. These structures are essential for providing the required strength, stability and durability to large-scale construction and industrial projects. The design and fabrication of such structures require engineering expertise, precision and adherence to technical standards prescribed by project consultants or end customers

Precision Fabricated Steel Structures or Technological Structures - Precision fabricated steel structures, also referred to as technological structures, are customized steel components designed for industrial plants, process units and specialized equipment installations that require strict dimensional accuracy and adherence to project-specific tolerances. These structures are manufactured to meet precise engineering specifications and are used in critical applications such as furnace support structures, accumulator towers, process platforms, equipment enclosures, galvanized tubing handrails, welded and bolted structures and other plant-specific assemblies. The fabrication process typically involves procurement of specified grades of steel followed by cutting, drilling, welding, machining, fit-up and assembly, along with surface treatments such as blasting, priming and painting. Due to the high precision requirements, these structures undergo trial assemblies, match marking and dimensional inspections to ensure they conform to design parameters before final delivery. Precision fabricated structures are essential for enabling smooth operations within process plants, ensuring proper alignment and integration of machinery and equipment and meeting the technical and operational requirements specified by end users or project consultants

Steel Bridge Structures - Steel bridge structures are fabricated steel components used in constructing railway bridges, road over bridges and other infrastructure projects requiring high load-bearing capacity and structural strength. These structures include elements such as open web girders, built-up sections, steel plate girders, pier shutters and pier cap shutters, all of which are essential for ensuring the structural integrity and stability of bridge superstructures. The fabrication process generally involves procurement of steel as per project specifications, followed by cutting, drilling, welding, machining, fit-up, trial assembly, surface treatment and protective coatings. Full-scale trial assemblies are carried out to ensure dimensional accuracy and alignment before final dispatch. Steel bridge structures are typically fabricated by the design and quality standards prescribed by organizations such as the Research Designs and Standards

Organization (RDSO) under the Ministry of Railways and are critical for ensuring safe and durable railway and road infrastructure.

PEB (Pre-Engineered Buildings)- Pre-Engineered Buildings (PEBs) are customized structural steel systems designed and fabricated to meet project-specific requirements for industrial, commercial and institutional buildings. These buildings consist of factory-fabricated components such as built-up columns, rafters, purlins, crane beams, roof panels, wall cladding, staircases and mezzanine floors, which are delivered to the site for assembly and erection. The fabrication process involves cutting, welding, drilling and surface treatment, followed by pre-assembly to ensure fitment before dispatch. PEBs are known for their faster construction timelines and cost efficiency, as components are fabricated off-site and assembled at the project location. These structures are commonly used in warehouses, manufacturing plants, logistics parks and commercial complexes, offering flexibility in design, ease of expansion and compatibility with various roofing and cladding options based on end-user requirements.

Business Process

Karbonsteel Engineering follows a structured manufacturing process, ensuring seamless execution from client engagement to project delivery.

Client Engagement & Requirement Collection: The process begins with receiving a Request for Quotation (RFQ), outlining design specifications, production volume, material requirements, technical details, and compliance standards. A Statement of Requirements (SOR) is reviewed, covering performance metrics, safety, training, warranty, and delivery timelines.

Quotation & Proposal Approval: The marketing team prepares a detailed proposal, including project scope, technical specifications, financial terms, and contract details. Upon client review and approval, a purchase order is issued, followed by initial payments, marking the formal project initiation.

Project Initiation & Coordination: A project manager is assigned, and internal teams (Design, Fabrication, Purchase, and Vendors) collaborate in a kickoff meeting to align execution strategies and ensure smooth workflow integration.

Timeline Development & Design Initiation: A project timeline is established and shared with stakeholders and the client. The design team develops structural layouts, which undergo feasibility reviews with fabrication and vendor teams to ensure precision and manufacturability.

Manufacturing Process: The fabrication process follows a structured workflow, ensuring adherence to technical specifications and quality standards. Advanced manufacturing techniques and stringent quality checks are implemented to maintain precision and durability.

System Trials & Validation: Prototype testing and fitment trials are conducted to verify compliance with customer requirements. Any necessary corrections are made before obtaining final customer approval for dispatch.

Commissioning & Handover: A detailed commissioning plan is shared with the client before dispatch. The Karbonsteel team supervises the on-site installation, ensuring proper alignment and integration. After final inspections for quality and structural integrity, the project is formally handed over, marking successful completion.

Major Projects Executed by Karbonsteel Engineering

Karbonsteel Engineering has played a pivotal role in delivering high-quality Structural Steel for critical industrial and infrastructure projects. Some of its notable projects include:

Cold Rolling Mill: Fabrication of precision-engineered structures to achieve the desired thickness and surface finish of metal.

Steel Melter Shop: Structural support for converting hot metal into various steel grades and casting them into different shapes.

High-Speed Bullet Train Bridges: Fabrication and erection of bridges, including the high-speed bullet train bridge at Billimoria.

Crane Girders: Engineered girders designed to support hoists for lifting lighter loads in industrial applications.

Refinery Precision Technical Structures: Specialized fabrication for refinery infrastructure, ensuring durability and compliance with industry standards.

Main Pump House for Blast Furnace: Structural framework to maintain thermal conditions within a blast furnace.

Hot Strip Mill-2: Fabrication of key components for producing hot rolled coils.

Furnace Support Structure: Robust Structural Steel designed to withstand high-temperature industrial processes.

The company has served various industries including steel manufacturing, Bullet Train Bridge, Refinery, Chemical Plants, High rise Buildings and Pre-Engineered Buildings, and many more. It has worked for multiple clients like Oil India Limited, JSW Steel, TATA Projects, LARSEN & TOUBRO (L&T), Indian Oil, HRRL, HMEL, RSPL, Aarti Industries, Aditya Birla Grasim and many more.

Karbonsteel Engineering has established itself as heavy Structural Steel engineering, backed by its advanced manufacturing facilities, state-of-the-art machinery, and commitment to quality. With strategically located units in Umbergaon and Khopoli the company ensures high-capacity production, efficient material handling, and strict quality control. Its expertise in precision-engineered heavy and technical Structural Steel coupled with adherence to international standards positions Karbonsteel as a trusted partner for infrastructure, industrial and engineering projects. As the company continues to expand and invest in cutting-edge technology, it remains dedicated to innovation, operational excellence and delivering superior steel solutions to meet evolving industry demands in India as well as in the export market.

Financial Benchmarking for Karbonsteel Engineering Ltd.:

Indicator (INR Million)	FY 2022	FY 2023	FY 2024
Revenue	1,012.42	1,555.80	2,183.38
Raw material cost	265.26	834.67	1,275.61
Power & Fuel cost	0.00	30.67	46.38
Employee cost	81.16	58.87	88.40
Interest cost	42.33	74.34	100.78
EBITDA	85.24	161.46	251.14
EBITDA Margin	8.4%	10.4%	11.5%
PAT	20.46	52.92	94.19
PAT Margin	2.0%	3.4%	4.3%
Debt Equity Ratio	0.91	0.74	0.45
Interest Coverage Ratio	2.01	2.17	2.49
Return on Assets	2.1%	3.6%	5.2%
Current Ratio	1.55	1.34	1.31

Source – Annual Reports

Karbonsteel Engineering Ltd. has demonstrated steady growth in revenue and profitability from FY 2022 to FY 2024, with revenue increasing from INR 1,012.42 million in FY 2022 to INR 2,183.38 million in FY 2024, reflecting a growth of over 115%. EBITDA rose significantly to INR 251.14 million in FY 2024, driving

the EBITDA margins higher, which grew from 8.4% in FY 2022 to 11.5% in FY 2024. PAT also grew substantially, reaching INR 94.19 million in FY 2024, with PAT margins improving from 2.0% in FY 2022 to 4.3% in FY 2024.

The company's debt-equity ratio decreased from 0.91 in FY 2022 to 0.45 in FY 2024, signaling reduced leverage and improved financial stability. The interest coverage ratio also improved from 2.01 in FY 2022 to 2.49 in FY 2024, indicating better earnings relative to interest obligations. Return on assets improved significantly from 2.1% in FY 2022 to 5.2% in FY 2024, reflecting enhanced asset utilization. However, the current ratio decreased slightly from 1.55 in FY 2022 to 1.31 in FY 2024, indicating a modest reduction in liquidity.

In terms of costs, the raw material cost increased from INR 265.26 million in FY 2022 to INR 1,275.61 million in FY 2024, reflecting the growing scale of operations. Power and fuel costs, which were negligible in FY 2022, rose to INR 46.38 million in FY 2024. Employee costs decreased slightly from INR 81.16 million in FY 2022 to INR 58.87 million in FY 2023 but rose again to INR 88.40 million in FY 2024, reflecting adjustments for operational needs and workforce expansion. Interest costs also grew over the period, from INR 42.33 million in FY 2022 to INR 100.78 million in FY 2024, as the company managed its increasing financial obligations.

Calculation Used:

PBT+Finance Cost+D&A	EBITDA
EBITDA/Revenue From Operation	EBITDA Margin
PAT	PAT
PAT/Total Income	PAT Margin
Long term Debt/Total Equity	Debt Equity Ratio
EBITDA/Interest Cost	Interest Coverage Ratio
PAT/Total Asset	Return on Assets
Current Assets/Current Liabilities.	Current Ratio