

# Assessment of welding consumables, wear plates and heavy engineering market in India

September 2024

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## 1. Macroeconomic assessment

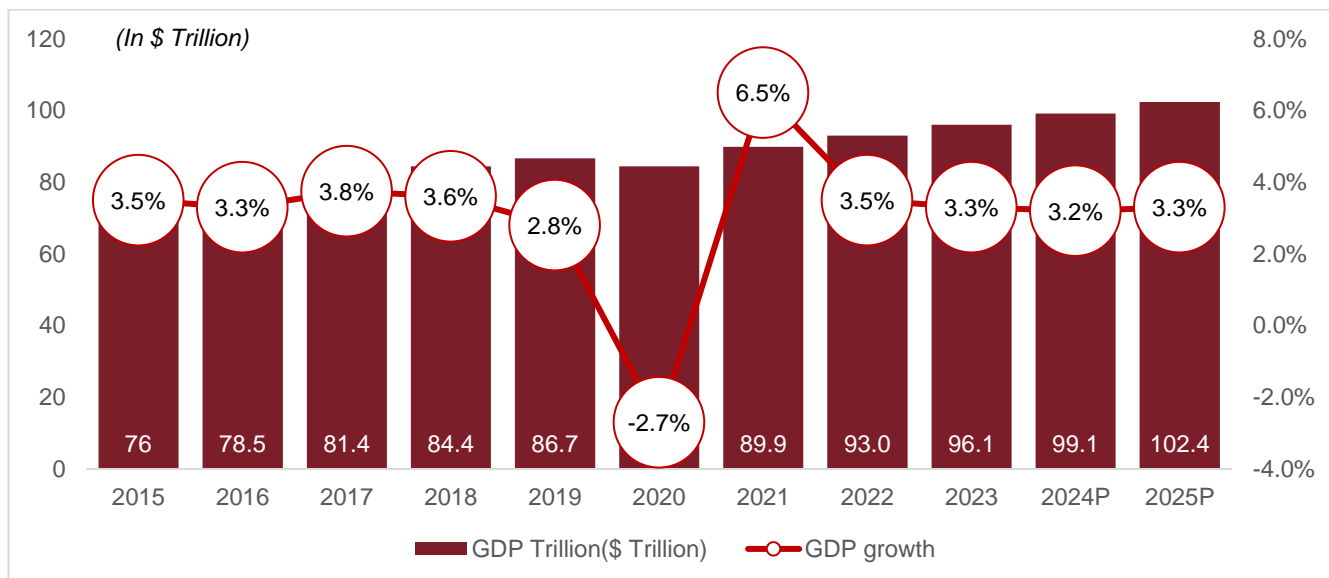
### 1.1 Global macroeconomic assessment

#### Global GDP is estimated to grow at 3.2% in CY 2024 and 3.3% in CY 2025 amid moderating inflation and steady growth in key economies

As per the International Monetary Fund’s (IMF) July 2024 update, global gross domestic product (GDP) growth is projected at 3.2% and 3.3% in 2024 and 2025 respectively. The latest estimate for 2024 is in line with IMF’s previous forecast in April 2024, mainly due to stabilization of economic activities and strong first quarter growth in many countries. Emerging market and developing economies are also expected to experience stable growth through 2024 and 2025, with regional differences.

With disinflation and steady growth, the likelihood of a hard landing has receded, and risks to global growth are broadly balanced. Amid favourable global supply developments, inflation has been falling faster than expected, however service inflation is holding up the progress on disinflation. On the upside, faster disinflation could lead to further easing of financial conditions. On the downside, new commodity price spikes from geopolitical shocks and supply disruptions or more persistent underlying inflation could prolong tight monetary conditions.

#### Trend and outlook for global GDP (2015-2024P)



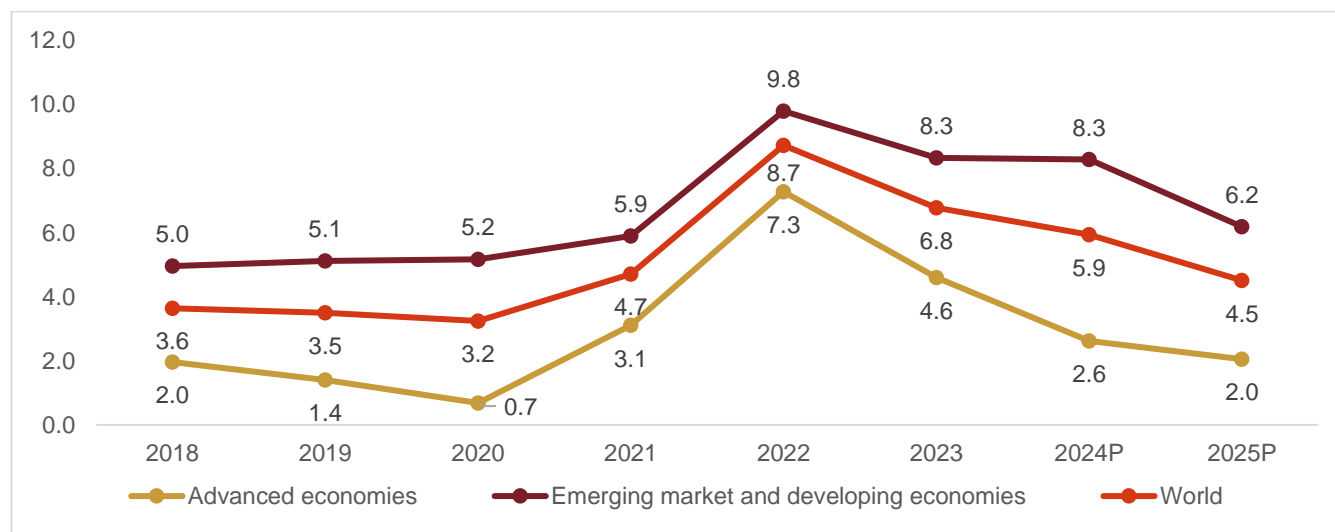
Note: E: Estimated, P: Projection

Source: IMF economic database, CRISIL Market Intelligence and Analytics (MI&A)

#### Global inflation to subside in the medium term

As per the IMF, global headline inflation is expected to decline from an estimated 6.8% in 2023 (annual average) to 5.9% in 2024 and 4.5% in 2025. In advanced economies, the decrease in 2024 is expected to be sharper at 2.0 percentage points to 2.6%. In emerging market and developing economies, though, it is projected to remain constant at around ~8.3%.

### Trend and outlook on consumer prices



Note: P: Projection  
Source: IMF, CRISIL MI&A

### Global per capita GDP

Global GDP per capita logged 3.4% compound annual growth rate (CAGR) between 2017 and 2023, as per IMF data while India's GDP expanded at ~4.2% CAGR between 2017 and 2023.

### Per capita GDP at current prices for key economies- \$ per capita

©	2017	2018	2019	2020	2021	2022	2023	2024P	CAGR 2017-2023
US	60,293	63,165	65,505	64,367	70,996	77,192	81,632	85,373	5.2%
Euro area	27,560	29,691	29,278	28,313	32,461	32,515	34,663	36,063	3.9%
UK	40,618	43,275	42,713	40,246	46,704	45,730	49,099	51,075	3.2%
China	8,760	9,849	10,170	10,525	12,572	12,643	12,514	13,136	6.1%
Japan	38,903	39,850	40,548	40,172	40,114	34,005	33,806	33,138	-2.3%
India	1,958	1,974	2,050	1,916	2,250	2,366	2,500	2,731	4.2%
<b>World</b>	10,924	11,472	11,518	11,111	12,527	12,894	13,359	13,836	3.4%

Source: IMF, CRISIL MI&A Research

### India among the world's fastest-growing key economies

Following the recovery from the COVID-19 pandemic, India exhibited a faster growth rate of 7.0% in FY2023, surpassing both advanced economies at 2.6% and emerging and developing economies at 4.1%. This trend is expected to continue, with India leading the growth compared to its key counterparts

### Real GDP growth by geographies- %

Regions	2018	2019	2020	2021	2022	2023	2024P	2025P
<b>US</b>	3.0	2.5	-2.2	5.8	1.9	2.5	2.6	1.9
<b>Euro area</b>	1.8	1.6	-6.1	5.9	3.4	0.4	0.8	1.5
<b>Canada</b>	2.7	1.9	-5.0	5.3	3.8	1.1	1.2	2.3
<b>UK</b>	1.4	1.6	-10.4	8.7	4.3	0.1	0.7	1.5

<b>China</b>	6.8	6.0	2.2	8.4	3.0	5.2	5.0	4.5
<b>Japan</b>	0.6	-0.4	-4.1	2.6	1.0	1.9	0.7	1.0
<b>India*</b>	6.5	3.9	-5.8	<b>9.7*</b>	<b>7.0*</b>	<b>8.2*</b>	<b>7.0*</b>	<b>6.5</b>
<b>World</b>	<b>3.6</b>	<b>2.8</b>	<b>-2.7</b>	<b>6.5</b>	<b>3.5</b>	<b>3.3</b>	<b>3.2</b>	<b>3.3</b>

Note: P: Projected. \* Numbers for India are for financial year (2020 is FY2021 and so on) and as per the IMF's forecast. ^India GDP estimate for the FY2024 is 8.2% according to provisional estimates from MoSPI. Note: Projection as per IMF update

Source: IMF economic database, CRISIL Market Intelligence and Analytics (MI&A)

## 1.2 India's macroeconomic assessment

### India's real GDP grew at 5.9% CAGR between FY12 and FY24

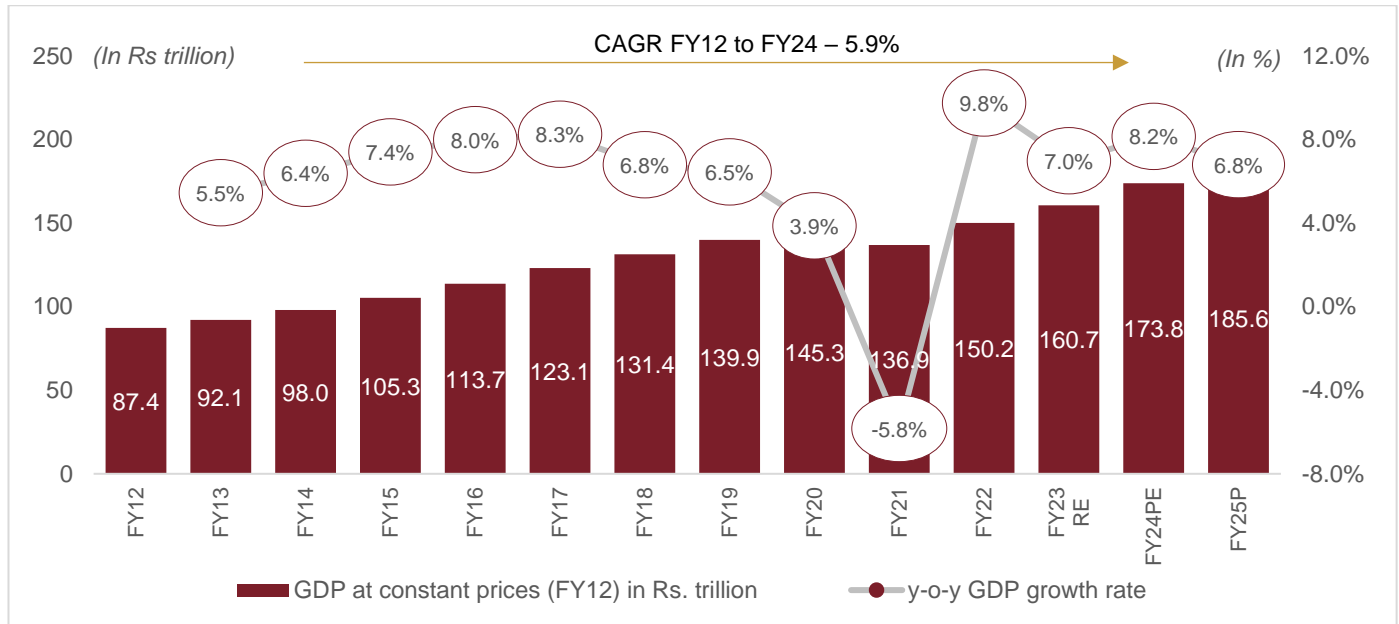
India's GDP grew at 5.9% compounded annual growth rate (CAGR) between FY12 and FY24 to Rs 173.8 trillion in FY24. A large part of the lower growth rate was because of challenges heaped by the Covid-19 pandemic in FY20 and FY21. In FY22, the economy recovered with abating of the pandemic and subsequent easing of restrictions and resumption in economic activity.

In FY23, GDP rose 7% on continued strong growth momentum, propelled by investments and private consumption. The share of investments in GDP was at 33.3% and that of private consumption was at 58.0%.

The National Statistics Office (NSO) in its provisional estimates of Annual Gross Domestic Product (GDP) for FY24, estimated India's real GDP growth to be 8.2% which is higher than its Second Advanced Estimate of 7.6%. Even as the agricultural economy slowed sharply following a weak monsoon, the surge in non-agricultural economy has more than made up for it. The government's investment push, along with easing input cost pressures for industry, has also played a major role in shoring up growth. However, services have been slowing owing to waning pent-up demand (post the pandemic), with the exception of financial, real estate and professional services, which has powered ahead on the back of robust growth in banking and real estate sectors.

Analysis of the FY24 year's growth reveal notable dichotomies. Growth has primarily been fueled by fixed investments, exhibiting a robust 9% expansion, while private consumption growth lagged at 4%, trailing overall GDP growth. On the supply side, the manufacturing sector experienced the most substantial growth at ~9.9%, while agriculture exhibited more modest growth rate of 1.4%. These trends underscore the varied performance across sectors, highlighting the nuanced dynamics shaping India's economic landscape in FY24. Overall, real GDP of India is estimated to have grown at 8.2% in FY24 compared with 7.0% in FY23.

**Real GDP growth in India (new series)**



RE – revised estimates, PE – Provision estimates, P – projection

Notes: The values are reported by the government under various stages of estimates

Actuals, estimates and projected data of GDP are provided in the bar graph

Source: Ministry of Statistics and Programme Implementation (MoSPI), CRISIL MI&A

**CRISIL forecasts India’s real GDP to grow 6.8% in FY25**

After a strong GDP print in the past three fiscals, CRISIL expects GDP growth to moderate in FY25 as fiscal consolidation will reduce the fiscal impulse to growth, rising borrowing costs and increased regulatory measures could weigh on demand, net tax impact on GDP is expected to normalize, and exports could be impacted due to uneven growth in key trade partners and any escalation of the Red Sea crisis. On the other hand, another spell of normal monsoon and easing inflation could revive rural demand.

At an overall level, India’s real GDP is expected to be 6.8% in FY25. This slower growth rate vs. FY24 will be because of slowing global growth, impact of rising interest rates, waning of pent-up demand for services and increasing geopolitical uncertainty. Still, the manufacturing sector, investments and domestic demand will remain resilient.

**India’s gross value added continues to record healthy growth**

On the supply side, gross value added (GVA) grew 7.2% in fiscal 2024 as per provisional estimates (compared with 6.7% growth in fiscal 2023). In absolute terms, real GVA was Rs 158.74 trillion in fiscal 2023, up from Rs 148.05 trillion in fiscal 2022.

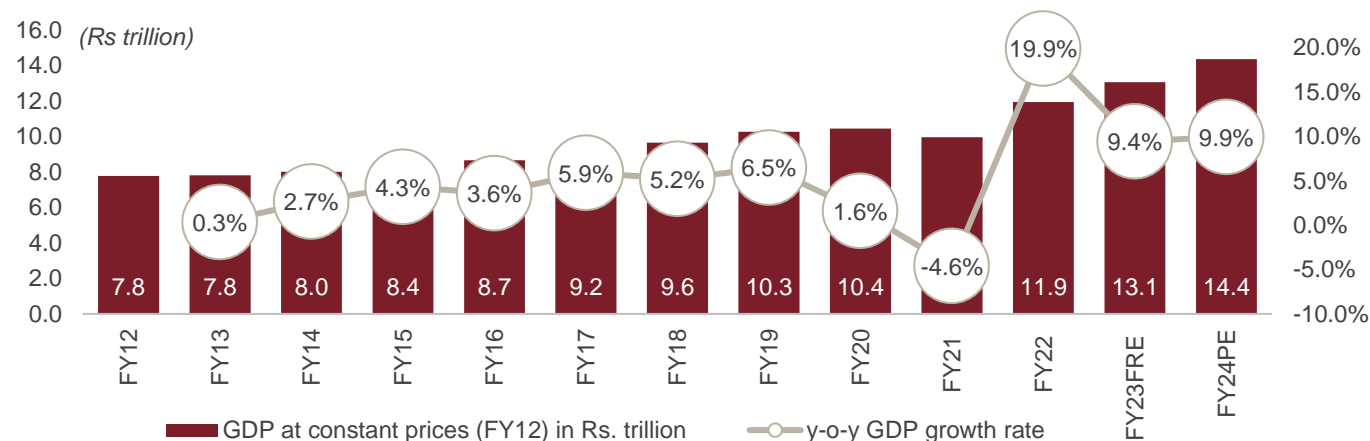
**GVA at constant fiscal 2012 prices**

Rs trillion	FY22RE	FY23FRE	FY24PE	Share in GVA FY24	Annual growth in FY24
<b>Agriculture, forestry and fishing</b>	21,70,106	22,72,250	23,04,982	15%	1.4%
<b>Mining and quarrying</b>	3,09,276	3,15,256	3,37,623	2%	7.1%
<b>Manufacturing</b>	25,61,033	25,04,663	27,51,680	17%	9.9%
<b>Utility services</b>	3,17,966	3,47,973	3,74,174	2%	7.5%
<b>Construction</b>	11,93,532	13,06,256	1,430,081	9%	9.9%
<b>Trade, hotels, transport, communication and services related to broadcasting</b>	24,80,380	27,77,723	29,55,767	19%	6.4%
<b>Financial, real estate and professional services</b>	31,22,847	34,05,474	36,91,645	23%	8.4%
<b>Public administration, defence and other services</b>	17,21,699	18,75,304	20,21,798	13%	7.8%
<b>GVA at basic prices</b>	1,38,76,840	1,48,04,901	1,58,73,751	100%	7.2%

RE: revised estimate, PE: provisional estimate

Source: CRISIL MI&A

**Construction GVA at constant fiscal 2012 prices**



Note: FRE: First Revised Estimates, PE: Provisional Estimates

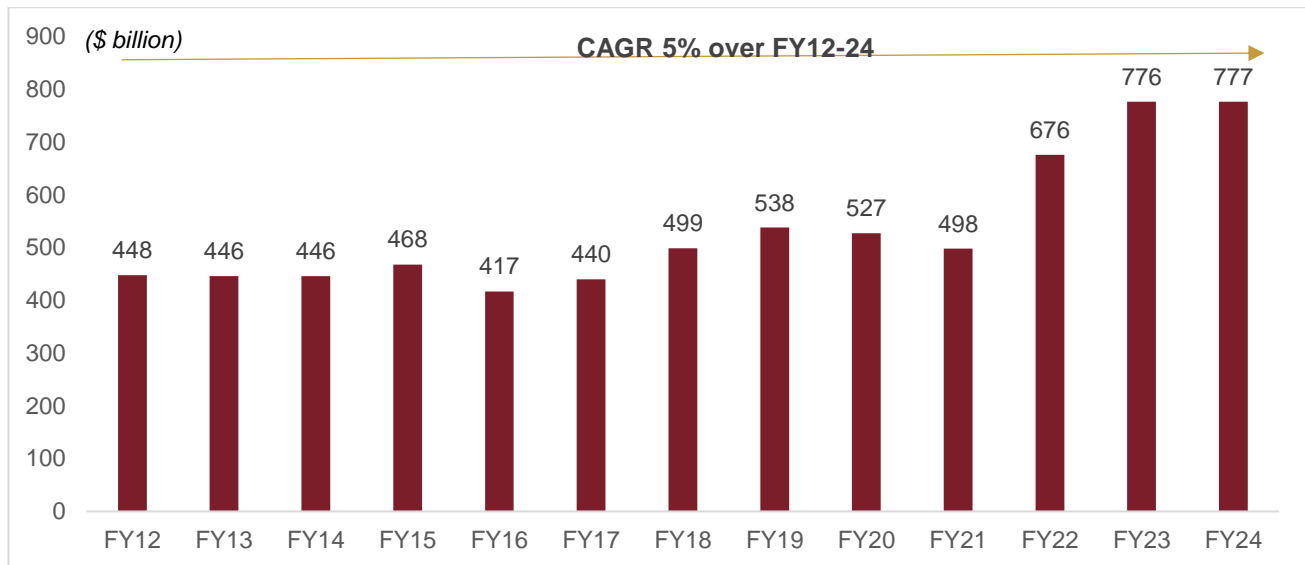
Source: CRISIL MI&A

Construction GVA at constant prices grew at 5.7% CAGR from fiscal 2012 to 2024, with a dip in contribution to the overall GVA from 9.6% in fiscal 2012 to 9.0% in fiscal 2024.

**India's exports increased at 5% CAGR between fiscals 2012 and 2024**

India achieved all-time high annual exports of \$777 billion in fiscal 2024. The steady rise in exports can be attributed to India becoming a major manufacturing hub for key products as well as the central government's push for local manufacturing of key goods.

**Trend in India's exports (merchandise + services)**

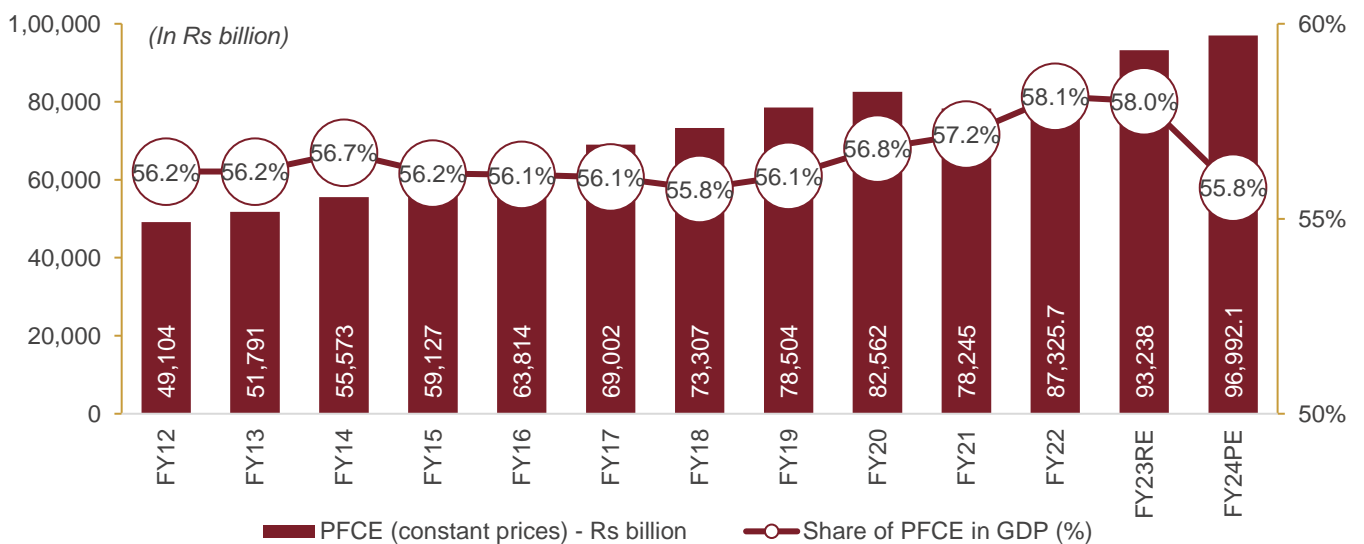


Source: Ministry of Commerce, CRISIL MI&A

**1.3 PFCE to maintain dominant share in India's GDP**

Private final consumption expenditure (PFCE) at constant prices clocked 6% CAGR between FY12-23, maintaining its dominant share of ~58.0% in FY23 (~Rs 93,238 billion in absolute terms, up 6.8% year-on-year). Growth was led by healthy monsoon, wage revisions due to the implementation of the Seventh Central Pay Commission's (CPC) recommendations, benign interest rates, growing middle age population and low inflation. As of FY24PE, PFCE is estimated to have further increased to Rs 96,992 billion, registering a y-o-y growth of ~4% and forming ~56% of India's GDP. The share of PFCE declined in FY2024 indicating slower growth for PFCE at 4% compared to overall GDP growth of 8.2%.

**PFCE at constant prices**



Note: RE: revised estimates; PE: Provisional estimates

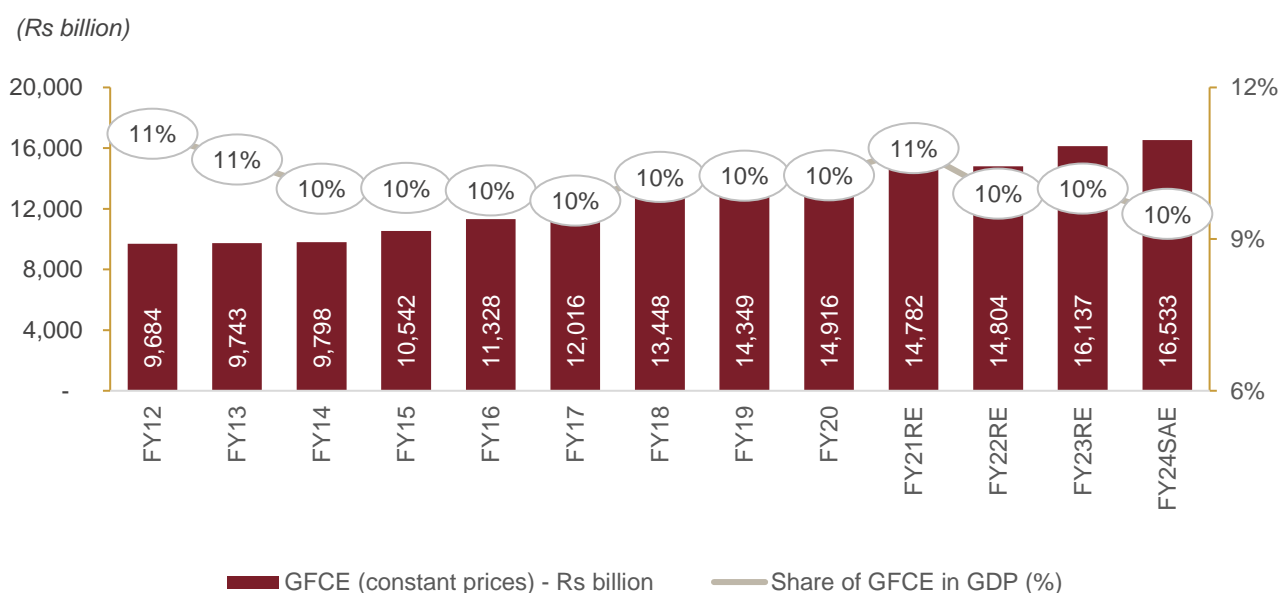
Source: MoSPI, CRISIL MI&A



### 1.4 GFCE maintains ~10-11% share in India's GDP

Government final consumption expenditure (GFCE) at constant prices clocked 4.6% CAGR between fiscal 2012 and 2024, maintaining ~10% share in the GDP pie, or ~Rs 16,533 billion. It grew 2.5 % on-year in fiscal 2024

#### GFCE (at constant prices)



Note: PE: provisional estimates; RE: revised estimates

Source: MoSPI, CRISIL MI&A

### Robust growth in per capita income over FY12-24

India's per capita income, a broad indicator of living standards, rose from Rs 63,462 in FY12 to Rs 99,404 in FY23, logging 4.2% CAGR. Growth was led by better job opportunities, propped up by overall GDP growth. Moreover, population growth remained stable at ~1% CAGR. Furthermore, according to FY24PE, per capita net national income (constant prices) is estimated to have increased to Rs 106,774; thereby registering a year-on-year growth of ~7.4%.

#### Per capita net national income at constant prices

	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21RE	FY22RE	FY23RE	FY24PE
Per-capita NNI (Rs)	63,462	65,538	68,572	72,805	77,659	83,003	87,586	92,133	94,270	86,054	94,054	99,404	106,744
Y-o-Y growth (%)		3.3	4.6	6.2	6.7	6.9	5.5	5.2	2.3	-8.7	9.3	5.7	7.4

Note: RE: revised estimates, PE: provisional estimates

Source: Provisional Estimates of Annual National Income, 2022-23, CSO, MoSPI, CRISIL MI&A

### India’s per capita GDP grows faster than global average

Global GDP per capita clocked 2.0% CAGR between 2012 and 2023, as per World Bank data. Meanwhile, India’s corresponding figure registered 5.1% CAGR.

#### Per capita GDP at current prices

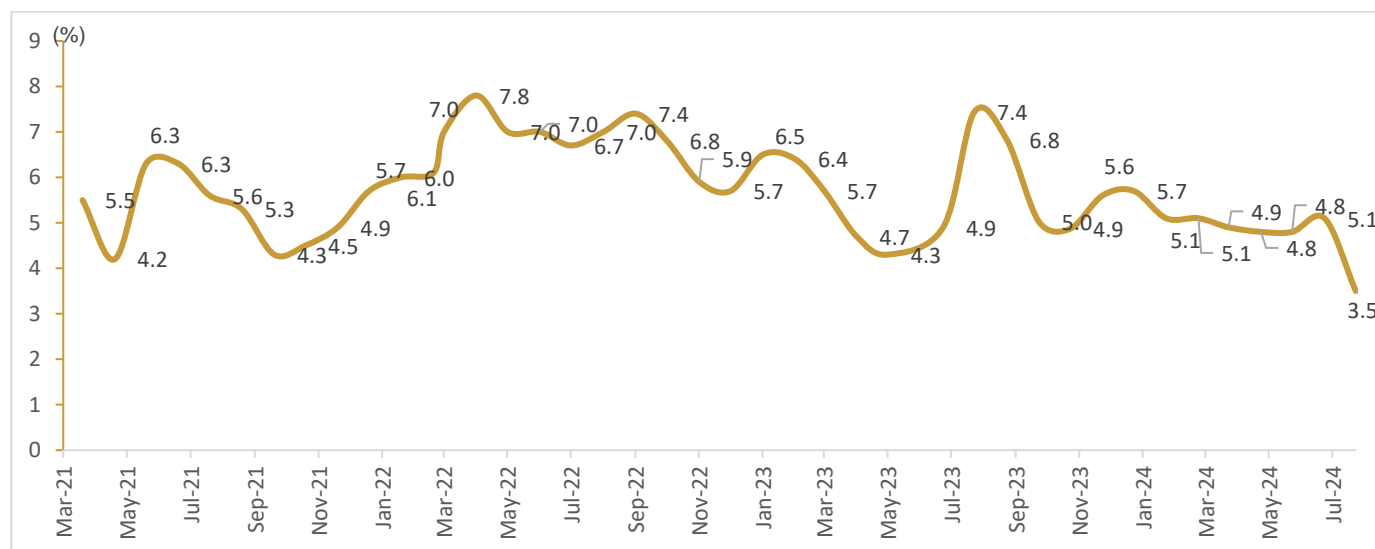
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	CAGR 2012-2022
<b>India per capita GDP at current prices (\$)</b>	1,434	1,438	1,560	1,590	1,714	1,958	1,974	2,050	1,916	2,250	2,366	2,485	5.1%
<b>World per capita GDP at current prices (\$)</b>	10,587	10,755	10,919	10,178	10,224	10,763	11,315	11,358	10,942	12,362	12,730	13,138	2.0%

Source: World Bank, CRISIL MI&A

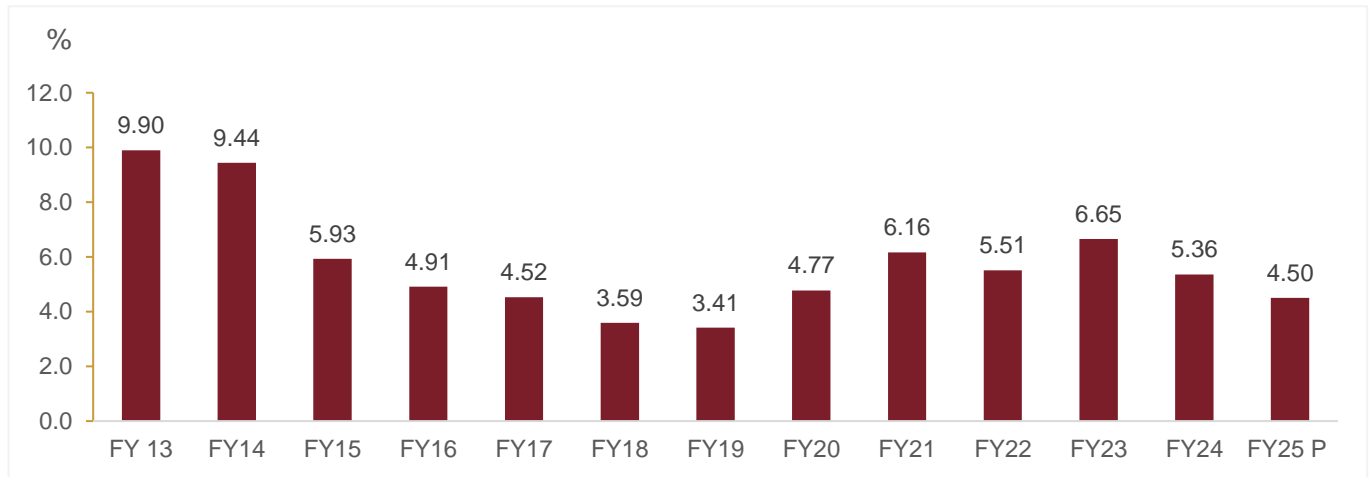
### 1.5 Review of Consumer Price Index (CPI)

Consumer price index (CPI) inflation eased to 3.5% in July from 5.1% in June. Food inflation too recorded a steep fall to 5.4% in July from 9.4% in June. However, from November 2023 to June 2024, food inflation has consistently been above 8% driven by costlier cereals and meat; vegetables as the pressure on food prices continued with the heatwaves being one of the factors. The core inflation has increased from 3.1% in June to 3.4% in July indicating things apart from food, fuel and light to be costlier.

#### Monthly CPI inflation – Near-term trend



**Annual CPI inflation – Near-term trend**



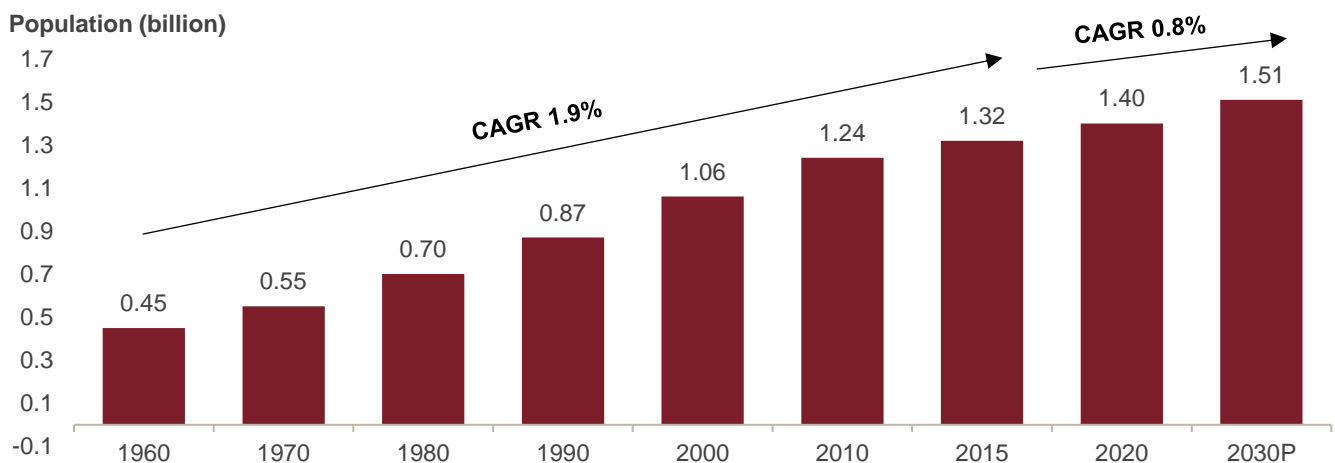
Source: MoSPI, CRISIL MI&A. P – projection

**1.6 India’s population is projected to log 0.8% CAGR between 2020 and 2030**

India’s population grew to ~1.2 billion according to Census 2011, at 1.9% CAGR during 2001-2011. As per the 2010 Census, the country had ~246 million households.

According to the United Nation’s (UN) World Urbanization Prospects, 2022 revision, India and China, two of the most populous countries, accounted for nearly 36% of the world’s population in 2021. The report projects India’s population to increase at 0.8% CAGR from 2020 to 2030 to reach 1.5 billion. According to the UN estimate, India surpassed China to become the most populous country in April 2023 with 1.425 billion people.

**India’s population growth**



Note: P: projected

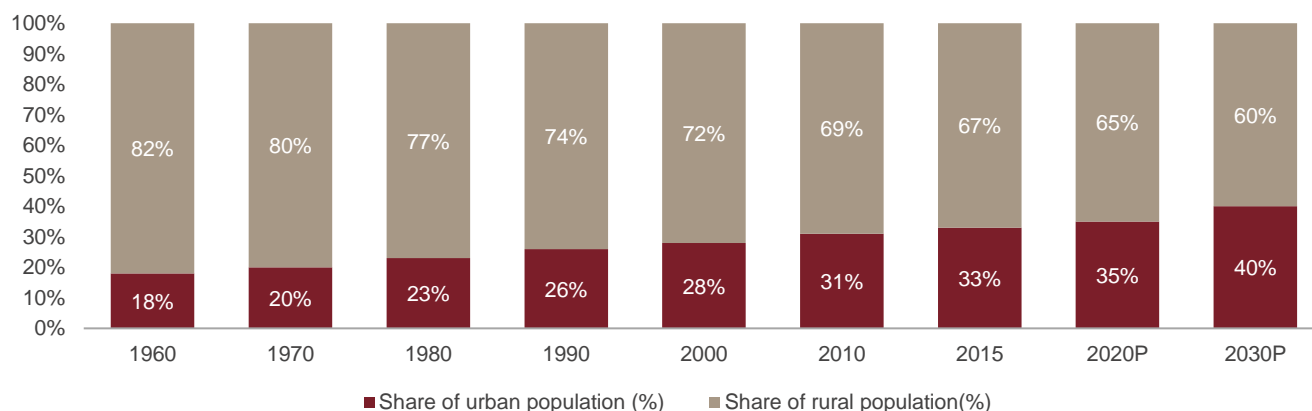
Source: UN Department of Economic and Social Affairs, World Population Prospects 2022, CRISIL MI&A

**Urbanisation to reach ~40% by 2030**

India’s urban population has been rising over the years and stood at ~31% of the total population in 2010. The rising trend is expected to continue. The UN report has projected that nearly 40% of the country’s population will live in urban areas by 2030.

People from rural areas move to cities for better job opportunities, education, and quality of life. The entire family or only a few individuals (generally an earning member or students) may migrate, while the other members continue living in rural house.

### India's urban vs. rural population-%



P: Projected

Source: World Urbanization Prospects: The 2018 Revision, United Nations; CRISIL MI&A

### Indian population's median age to rise to 30.9 years by 2030

According to the UN, the global median age rose to ~30 years in 2020 from ~20 years in 1970. This is lower than the median age in developed countries such as the US (37.5 years) and the UK (39.5 years).

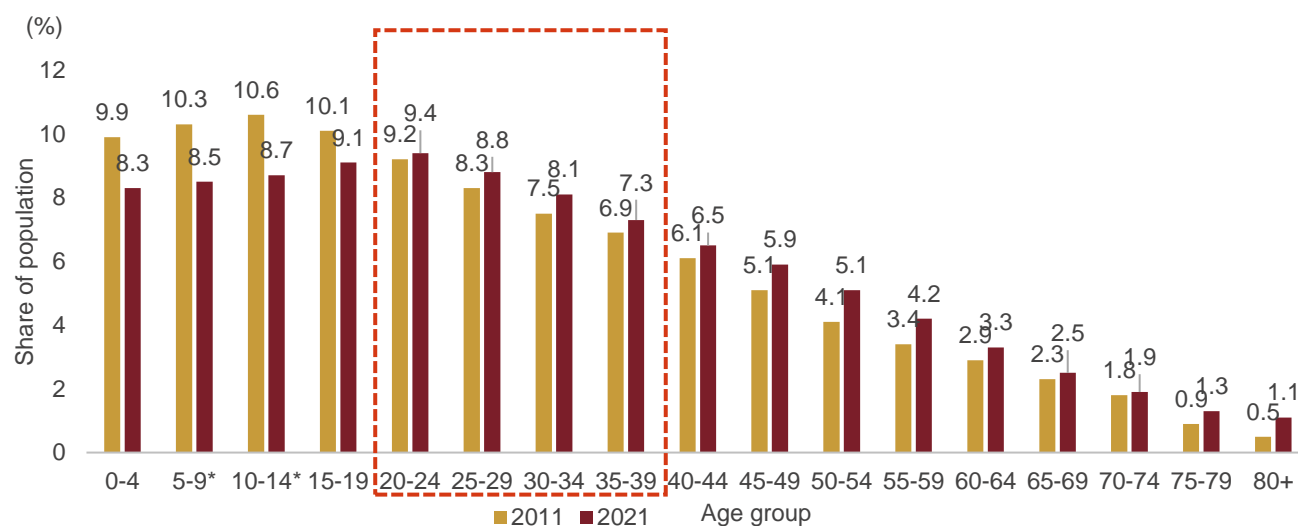
Interestingly, India's median age is 27.3 years, indicating a favorable demographic dividend. Furthermore, it is the lowest among its BRIC peers: Brazil (32.4 years), Russia (37.4 years), and China 38.6 years. This trend is expected to continue up to 2030, implying strong potential for an increase in income, and basic and healthcare spending, with a large proportion of the population being employed. Median age is expected to reach 30.9 years, indicating higher mid-age working population.

### Median age trend across key countries

Country	1970	1990	2010	2015	2020	2030P
Brazil	17.3	21.5	28.2	30.3	32.4	36.5
China	18.0	23.7	34.1	35.6	37.4	42.7
India	18.3	20.0	24.0	25.5	27.3	30.9
Russian Federation	29.7	32.2	36.9	37.6	38.6	42.1
UK	33.2	34.8	38.5	39.0	39.5	41.6
US	27.2	31.8	36.1	36.6	37.5	39.7
World	20.3	23.0	27.3	28.5	29.7	32.1

Source: United Nations, Department of Economic and Social Affairs, Population Division (2022); World Population Prospects 2022, CRISIL MI&A

**About 32% of the Indian population is in the 20-39 years age group**



Source: Census 2011, CRISIL MI&A

Census 2011 pegged India’s population at 1.2 billion; ~51% males and ~49% females. About half of the population was in the 20-60 age bracket. Of this, ~32% was 20-39 years old and projected to rise to ~34% by 2021.

**India’s youth to account for ~39% of its population by 2030**

As per the United Nations’ 2022 Revision of World Population Prospects, India’s youth (0-24 years) accounted for nearly half its population in 2010, significantly higher than that of some of its peers: Brazil at 42.5%, China at 35.1%, and the Russian Federation at 29.7%. The fact that ~31% of the population is aged below 15 indicates that a high proportion of country’s young population is expected to remain so in the coming years.

This share is, in fact, expected to reach ~39% by 2030, and remain higher than Brazil’s 31.5%, China’s 25.4%, and the Russian Federation’s 27.7%. This also indicates higher proportion of population entering the workforce.

**Age-wise population break-up for key countries**

Country	0-14 years	15-24 years	25-49 years	50-69 years	70+ years	Total
<b>Brazil</b>						
2010	24.8%	17.7%	37.6%	15.6%	4.4%	100%
2020	20.8%	15.6%	38.3%	19.5%	5.8%	100%
2030P	18.2%	13.3%	37.4%	22.6%	8.4%	100%
<b>China</b>						
2010	18.5%	16.6%	40.3%	19.0%	5.7%	100%
2020	18.0%	11.4%	37.6%	25.5%	7.5%	100%
2030P	13.1%	12.3%	34.0%	28.6%	12.0%	100%
<b>India</b>						
2010	31.0%	19.1%	33.9%	12.9%	3.1%	100%
2020	26.1%	18.2%	36.2%	15.5%	3.9%	100%
2030P	22.3%	16.2%	38.0%	17.9%	5.5%	100%
<b>Russian Federation</b>						

Country	0-14 years	15-24 years	25-49 years	50-69 years	70+ years	Total
2010	15.2%	14.6%	37.2%	23.2%	9.8%	100%
2020	17.7%	9.8%	37.4%	25.5%	9.7%	100%
2030P	15.4%	12.4%	33.8%	25.2%	13.3%	100%
<b>UK</b>						
2010	17.6%	13.1%	34.8%	22.9%	11.6%	100%
2020	17.8%	11.6%	32.5%	24.4%	13.7%	100%
2030P	15.4%	12.2%	31.9%	24.5%	15.9%	100%
<b>US</b>						
2010	19.9%	14.1%	34.1%	22.8%	9.1%	100%
2020	18.5%	13.1%	33.0%	24.7%	10.7%	100%
2030P	16.4%	12.5%	33.2%	23.0%	14.8%	100%

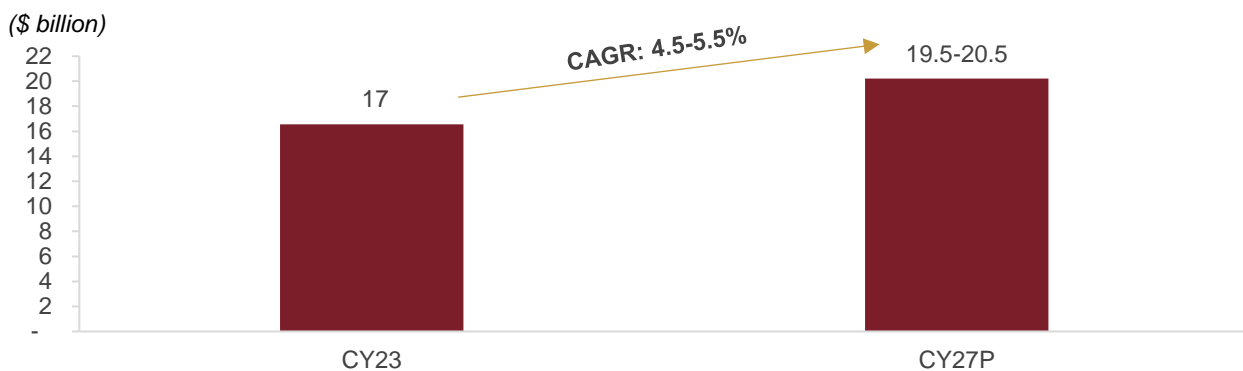
P: Projected

Source: United Nations, Department of Economic and Social Affairs, Population Division (2022); World Population Prospects 2022, CRISIL MI&A

## 2. Assessment of welding consumables industry

Welding consumables are used across industries to manufacture essential products. In the welding process, the selection of appropriate welding consumables, such as electrodes and wire, holds immense significance. These seemingly small components play a vital role in ensuring welds of exceptional quality and durability. They impact the strength, integrity, and appearance of the final weld.

### 2.1 Global welding consumables industry



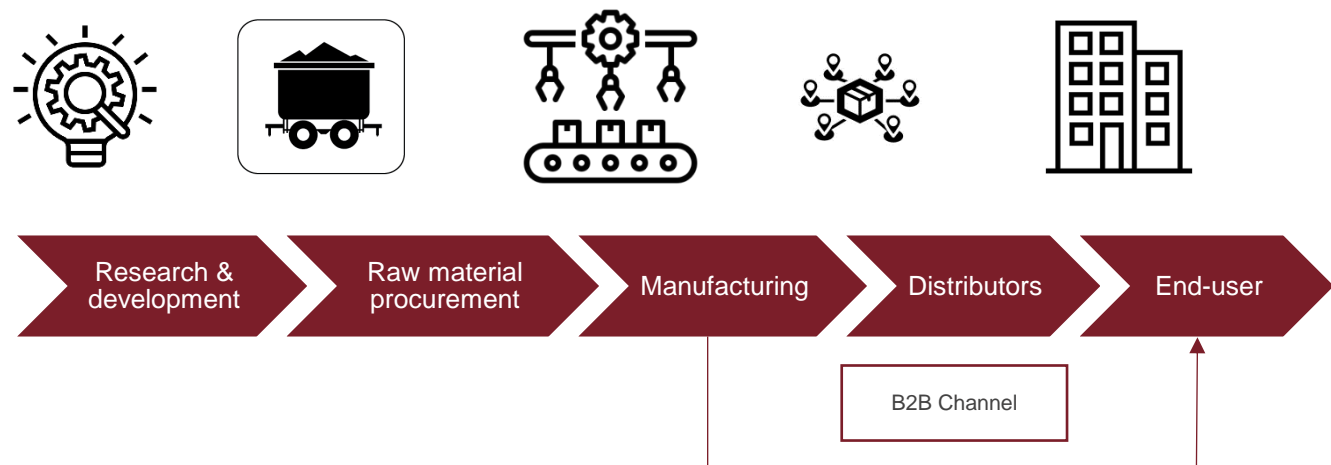
Note: E: Estimated, P: Projected

Source: International Market Analysis Research and Consulting Group (IMARC) welding consumable market report

The global welding consumables market was estimated at ~\$16.6 billion in calendar year (CY) 2023, and is projected to grow to ~\$19.5-20.5 billion in CY27, at a CAGR of ~5 %.

Growth of the welding consumables industry is driven by the automotive, construction, oil and natural gas, and commercial aerospace end-use industries. Wide acceptance and implementation of automated welding techniques, which resulted in a diverse array of welding solutions, will further drive growth. Rise in urban population along with increasing technological advancement in various industries will contribute as well. However, challenges do exist; for instance, in developing countries adoption of welding consumables is slow due to lack of skills and limited capital.

#### 2.1.1 Value chain of global welding consumable market



### 2.1.2 Share of global welding consumables market by region

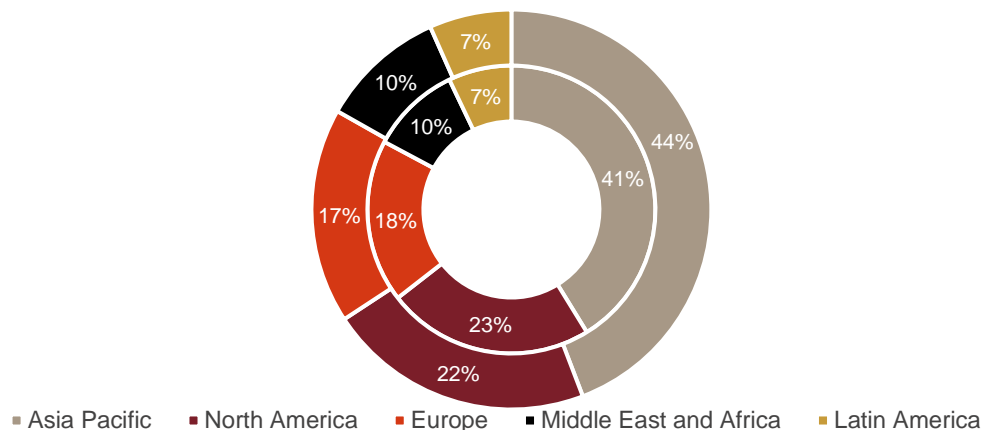
In the welding consumables market, the Asia-Pacific region has the highest share, with around 41% contribution in global welding consumables market. With the availability of cheap manufacturing in Asian countries, such as China and India, many global industrial players make their production facilities in this region, leading to higher demand for welding consumables.

North America has the second biggest market for welding consumables after Asia, due to the presence of large automotive and component manufacturers. Europe’s market share in the welding consumable market is about 18% in 2023, with Germany, the UK and France driving market growth. In Germany, the welding consumables market is promoted by the boost in the housing sector.

In the Middle East and Africa region, growth is led by construction in GCC countries, such as the UAE, Qatar, and Saudi Arabia. In this region, key end industries with high consumption of welding consumables are construction and automobile.

Latin American countries, such as Argentina, Mexico, Colombia, Brazil, Venezuela, where oil and gas is a key industry, are creating a demand for welding consumables market. In some of the countries, the rise in the automobile sector due to improving economies is also promoting the market.

#### Region-wise share in global welding consumables market



Note: Inner circle – CY23; Outer circle – CY27P

UK is included in Europe

Source: International Market Analysis Research and Consulting Group (IMARC) welding consumable market report

### 2.1.3 Share of global welding consumables market by end use industry

Among the key end use industry for welding consumables market, the construction industry captures a key portion of the market. Growth of construction projects across countries, such as China, India, and the US, in sectors such as housing, education, healthcare, and social infrastructure will facilitate growth in the welding consumables market.

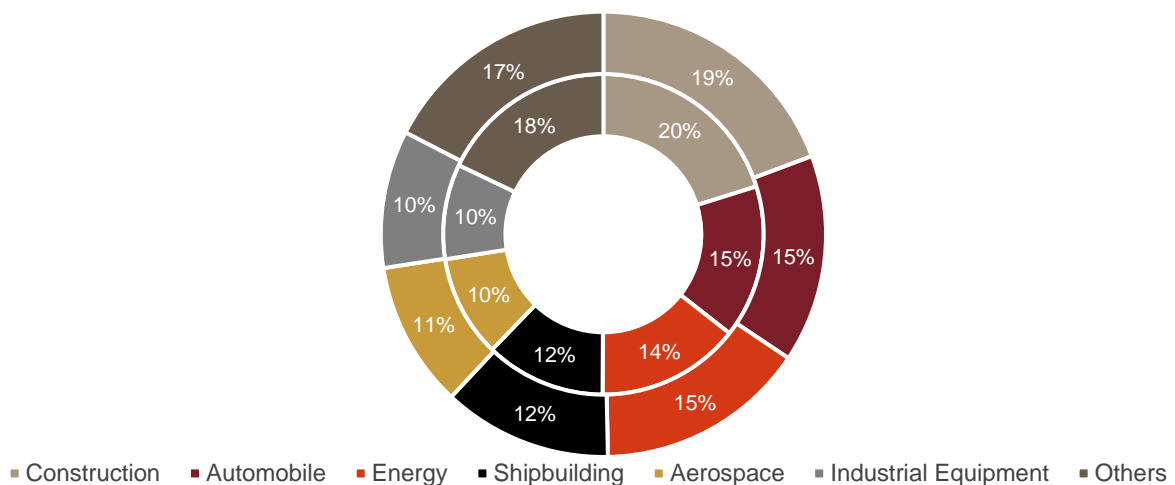
In the automobiles industry, welding consumables play a key role for the manufacturing of vehicle parts with high quality and light weight. New automobile designs and new safety features in the automobile sector would drive growth in the welding consumables market.



In the energy industry, welding increases the strength of the oil and gas pipes. So, a rise in new oil and gas pipelines globally will drive growth in the welding consumables market. Along with the oil and gas industry, welding plays a key role in power generation industry as well. So, as countries such as China and India invest in thermal power industry for power generation, spending in the welding consumable market would likely grow.

In other sectors, such as shipbuilding, aerospace, and industrial equipment, investments in production facilities for new plants and maintenance, along with rising demand for aircraft, ships, and other industrial equipment, would drive growth in the welding consumables market.

**Industry-wise share in global welding consumables market**



Note: Inner circle – CY23; Outer circle – CY27P

Source: International Market Analysis Research and Consulting Group (IMARC) welding consumable market report

**2.1.4 Key drivers and trends in the global welding industry**

- With rising urbanization and disposable income in the developing countries, a lot of investment is expected in the infrastructure sector. Not only in the construction sector, industrial sector in developing countries is also emerging and growing at a healthy rate. As welding is a key component of construction and industrial sector, growth in these industries is expected to boost the consumption and, in turn, growth of welding consumables market
- As demand for energy increases globally, there will be a rise in oil and natural gas pipeline infrastructure. Welding plays a key role in oil and natural gas pipeline infrastructure, as transportation of these fuels requires joining of many pipes though welding. So, with the rising demand for energy due to increasing population, industrialization and mobility, investments in the oil and gas industry would support growth in the welding consumables market.
- The automotive sector is witnessing strong growth in both developed and developing countries, driven by economic growth, rising population and investment in infrastructure across these countries. Also, the automotive sector is witnessing a rise in the use of welding techniques, due to the growing demand for customized products. So, demand in the automobile sector will promote growth of the welding consumables market.

### 2.1.5 Impact of Covid-19 on the global welding industry

Like other industries, the global welding industry too got impacted by Covid-19 on both demand and supply sides. On the supply side, the industry faced many challenges, such as lack of labour, global and domestic supply chain disruptions. These supply chain disruptions resulted in delays in sourcing of key raw materials along with distribution of end products.

From the demand side, due to lack of uncertainty and low demand across industries, such as automotive and construction, due to lockdowns and dip in economies, demand for welding consumables sector, in turn, dipped, affecting most key welding consumable manufacturers in the market.

## 2.2 Welding consumables market in India

Manufactures in India heavily rely on welding consumables as a primary technique for joining metals, as no other method offers such wide-ranging benefits. Welding consumables, which are materials that facilitate the joining of two metal or alloys, are critical components of welding operations, as the quality and strength of the joint in welding is dependent on them. As different welding consumables have different properties and characteristics, selection of consumables vary according to the type of metals that are being welded, the process used in welding, and the application of the final products.

### An overview of the key sub sectors in the welding consumables market

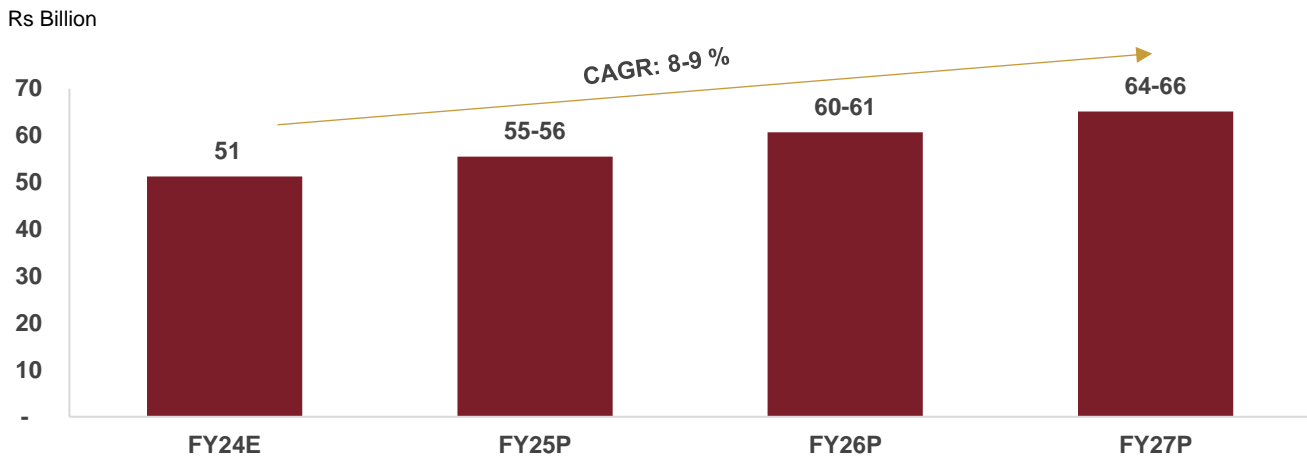
Sub-sector	Sector overview
Filler wires	<ul style="list-style-type: none"> <li>• Filler wires are used to secure strong joints between two metals, as these wires melt and flow in the middle of the two metals and form a joint</li> <li>• Solid wire, flux-cored wire and metal cored wire are some of the common types of filler wires</li> </ul>
Welding electrodes	<ul style="list-style-type: none"> <li>• In the welding circuit, welding electrodes serve the purpose of conducting electrical current to the workpiece</li> <li>• Electrodes sometimes also act as filler metal, such as in manual arc welding and gas metal arc welding in the form of consumable electrodes.</li> <li>• There are three key types of electrodes-bar electrodes, light-coated electrodes, and shielded arc electrodes</li> </ul>
Flux	<ul style="list-style-type: none"> <li>• It is used to prevent contamination by oxygen and other contaminants of molten weld metal</li> <li>• Apart from preventing oxidation of the molten weld metal, it is also used to provide additional heat during welding operation and improve the quality of high strength welds</li> </ul>

Welding consumables are used extensively in the infrastructure sector in construction of roads, bridges, ports and airports. Also, welding consumables form a key component for constructing and maintaining plants across industries, such as power, cement, railways and automotive.

### 2.2.1 Market size of the welding consumables industry in India

Welding consumables market in India is estimated at around Rs 51 billion in fiscal 2024, with fiscal 2027 projections around Rs 64-66 billion. Due to the rise in demand for improved infrastructure, a lot of investment is happening in infrastructure development, such as construction of roads, bridges, ports and airports. This investment in infrastructure is one of the key growth drivers for the welding consumables sector, because welding is indispensable in the construction industry, as it provides strong and reliable joining solutions for structural components.

**Trend in welding consumables market in India**



Note: E — estimated, P — projected

Source: CRISIL MI&A

Also, expansion of industries such as heavy engineering, energy, oil & gas, shipbuilding, railways, power, transportation, and automotive, promotes growth of the welding consumables sector due to construction and maintenance of plants in these industries. As India aims to become a global manufacturing hub, growth in the manufacturing sector will lead to a rise in the welding consumables sector. Government initiatives such as National Infrastructure Pipeline, in which about Rs 111 lakh crore is to be invested in infrastructure during fiscals 2020 to 2025 in sectors such as heavy engineering, roads, urban infra, and railways, along with industrial reforms, such as ‘Make in India’ and ‘Atmanirbhar Bharat’, will support growth in the welding consumables sector.

**2.2.2 Key product segments in the Indian welding consumables industry**

**1. Filler wire**

These wires/metals are used to secure a strong bond between the two metal joints during the welding process. When heated, these metals melt to flow into the space between the two close fittings, forming a joint. Filler wires contribute to the reinforcement and durability of weld joints, minimizing the risk of cracking when the metal joint is subjected to stress or strain. Filler wires are available in various configurations, based on need of MIG, TIG and SAW welding procedures.

Common types of filler wires are **solid wires, flux-cored wires and metal-cored wires**. A solid wire, which is typically a continuous solid wire, is often coated with copper to prevent oxidation, enhance electrical conductivity, and extend the lifespan of the welding contact tip. Flux-cored wires use electric arc fuse for joining two pieces of metal together. These wires protect the welds from contamination and oxidation. A metal-cored wire consists of a tubular wire that is filled with metallic powder, alloys, and arc stabilizers. Its utilization provides advantages, such as increased duty cycles, faster travel speeds, reduced fume emissions, and enhanced cost-effectiveness.

There are many types of filler wire metal, with each metal serving a purpose and use. Mild steel, widely employed in welding, finds extensive applications for joining various base materials, including carbon steel and low-alloy steel. Stainless steel demands a more robust alloy with increased tensile strength compared with mild steel. Tungsten inert gas (TIG) and plasma arc welding employ a distinct type of filler metal, distinct from other welding processes.

Filler metals are frequently utilized to achieve a more seamless weld deposit and mitigate porosity problems. One approach is to select a filler metal with a chemical composition matching that of the base material, ensuring similarity in characteristics between the weld pool, weld deposit, and base material, thereby minimizing post-welding concerns, such as cracking and distortion in the final product arising from disparities in properties.

## **2. Welding electrodes**

A welding electrode is a metallic rod that contains two distinct metals, wires, or filler materials. When connected from a welding machine to the base metal, it undergoes melting due to the intense electrical heat, facilitating the joining of two separate metal parts with a strong and seamless result.

Types of welding electrodes include bar electrodes, light coated electrodes, and shielded arc electrodes. Bare electrodes, which lack any form of coating, are primarily utilized in applications, where a coated electrode is unnecessary. Lightly coated electrodes are an enhanced variant of bare electrodes, featuring a thin layer of coating that measures a few tenths of a millimeter in thickness. Shielded arc electrodes have a layer of heavy coating. These electrodes are utilized to achieve high-quality welding metal by preventing the formation of oxides and nitrides through a substantial coating layer.

The utilization of these electrodes enhances the melting speed, thereby expediting the welding process. Coating of electrodes provides insulation, allowing their usage at high currents. These electrodes enable an effortless execution of overhead and vertical welding tasks. Also, the electrodes are protected from contamination due to coating.

### **2.3 An overview of key regulations in the welding consumable industry in India**

The Indian welding consumables industry is regulated by key laws and certifications, which are required to set key standard and specifications for various products in the industry. One of the key regulations for operating in this industry is to get ISO certifications from Bureau of Indian Standards (BIS). A summary of key certifications for the welding consumables industry is as follows:

#### **1. IS 2879:1998**

This certification encompasses the specifications for mild steel billets, blooms, cast billet ingots, and wire rods intended for use as core wire in metal arc welding electrodes. For this certification, the chemical composition of specimen is analysed for each element and material structure of the specimen is tested for the allowed tolerance. The steel used for the electric rod shall be provided in the form of billets, cast billet ingots, or wire rods, with sizes as specified by the purchasers. While manufacturing, sufficient reduction and discard shall be made from each ingot to ensure freedom from piping, segregation, and other harmful effects.

#### **2. IS 10631:1983**

This standard outlines the specifications for stainless steel in the form of billets and wire rods, which are utilized in the manufacturing of welding electrode core wire. The stainless steel used for the core wire of electrodes shall be provided in the form of billets or rolled wire rods, with sizes as specified by the purchaser. Electric melting process shall be used to manufacture steel. Chemical composition of specimen is analysed for each element and material structure of the specimen is tested the allowed tolerance.

**3. IS 9857:1990**

This standard encompasses the requirements and testing procedures for single-core flexible cables utilized in welding circuits. For the certification, annealing, conductor resistance, thickness of covering and high voltage water immersion test is conducted.

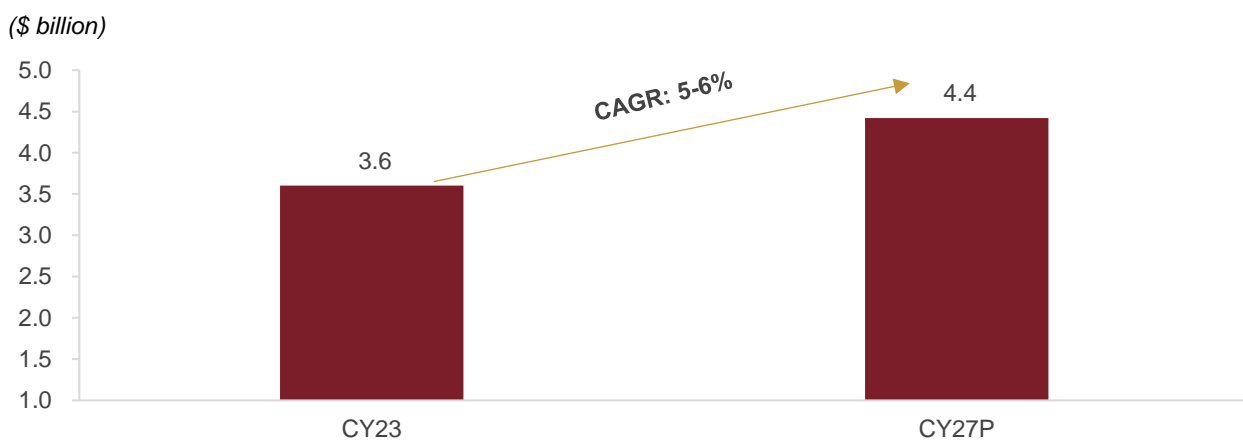
**4. IS 15789: 2008**

This standard provides specifications for continuous flux-cored electrodes used in metal arc welding, with or without shielding gas. The electrodes are designed to deposit carbon or carbon-manganese steel weld metal, which possess a tensile strength of up to 610 MPa. Chemical analysis, radiographic soundness test, all weld metal tensile strength, Charpy V-Notch Impact Test, fillet weld notch test, transverse tensile test, longitudinal bend test and diffusible hydrogen test are conducted for this certification. Upon conducting an on-site visit to the manufacturing premises, the Bureau evaluates the manufacturing infrastructure, production process, quality control measures, and testing capabilities. Based on a successful assessment, the Bureau grants a license to the manufacturer.

### 3. An assessment of the wear plates industry

#### 3.1 Global wear plates market

Globally, wear plates play an essential role in plants across industries in protecting key equipment, increasing efficiency by reducing the frequency of part replacements and providing cost-saving benefits. The global wear plates market is estimated to be around \$3.6 billion for calendar 2023, with calendar 2027 projections around \$4.4 billion at ~5-6% CAGR. The demand for construction equipment and the need to protect key mining equipment is driving growth in the wear plates sector globally. Also, growing application of wear plates in the mining industry to prevent abrasion and increasing lifespan of mining equipment is driving growth in the market.



Note: E — estimated, P — projected

Source: International Market Analysis Research and Consulting Group (IMARC) wear plates market report

#### 3.1.1 Share of global wear plates market by region

Asia contributes the highest in the consumption of wear plates market globally, as it is the largest coal mining region in the world. To protect key mining equipment, wear plates are used and are in demand in the region.

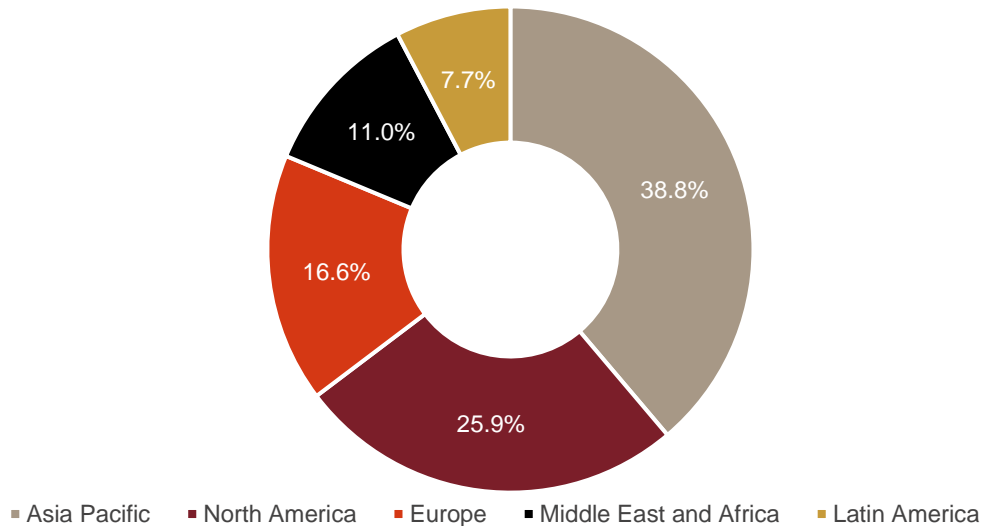
In Europe, several infrastructure projects, especially in the transportation sector, are creating demand for wear plates in the region. Additionally, in this region, a lot of mining activity for minerals, such as iron ore, zinc and gold, also create demand for wear plates in the region.

In North America, there is a surge in mining activities in countries, such as Canada, for copper, nickel and cobalt. These mining activities, along with infrastructure development in the region, are fueling the demand for wear plates.

In Latin America, increasing urbanization and population are promoting the demand for commercial as well as residential construction in the region. The rise in such construction programs will create demand for the wear plates sector.

In the Middle East, exploration, and extraction of key minerals, such as oil, natural gas and gold, are the key components of their economy with substantial investments. These activities would require wear plates to protect key components, thus promoting the wear plate market. Also, a lot of infrastructure investment is happening in the Middle East region - such as the Neom project - to boost the economy, thus also enabling growth in the wear plates sector.

**Region wise share in global wear plates market-CY23**



Note- UK is included in Europe

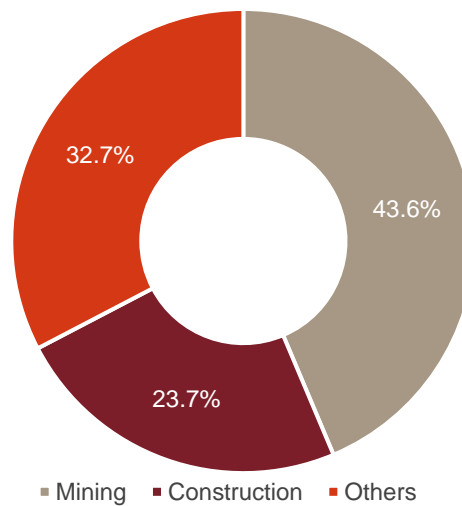
Source: International Market Analysis Research and Consulting Group (IMARC) wear plates market report

**3.1.2 Share of global wear plates market, by end-use industry**

Mining and construction industry are the key contributors to the consumption of the wear plates globally. During mining, while transporting ore material, loading and unloading leads to abrasion in wear plates. This way wear plates form a key part of the mining industry and investments in the mining sector globally will push consumption of wear plates. Also new technological developments in wear plates used in mining operations also create demand for these plates.

Globally, the construction sector attracts investments due to rising urbanisation, population and growing industrialisation. These investments in the construction sector led to demand for construction equipment and machinery. These machineries require wear plates to prevent abrasion and for a longer life span. Thus, the rise in the construction sector is one the key factor driving growth in the wear plates industry

**Industry-wise share in the global wear plates market, CY23**



Source: International Market Analysis Research and Consulting Group (IMARC) wear plates market report

**3.1.3 Key drivers and trends in the global wear plates industry**

- As the mineral resources play a key role in the world economy, the mining sector globally is expected to witness high investments in the sector. With these investments in the mining sector, a portion would be in upgrading and maintaining the mining equipment. As wear plates protect mining equipment against abrasion, these plates would play a key role in the mining industry and thus would attract high consumption in this sector
- As the global economy grows, various economies in the world would invest heavily on infrastructure development, due to rising urbanisation and increasing industrialisation. With the investment in the construction industry, protecting construction machinery and equipment against abrasion would be vital. Since wear plates play a key role in extending the life of construction machinery and equipment, these plates would see a constant demand from the construction sector.
- In the wear plates market, key innovations, such as laser cladding, plasma transferred arc and advance casting methods, are promoting wear plates with increased durability. Similarly, other advancements in technology in the wear plates sector, would attract new customers in these sectors looking for high-performance wear plates with customised options. Similarly, adopting new composite materials, such as wear-resistant composite materials over traditional wear plates would offer new opportunities for this market, as these composite materials offer advantages, such as being lightweight, increased customizability and lower maintenance requirement.

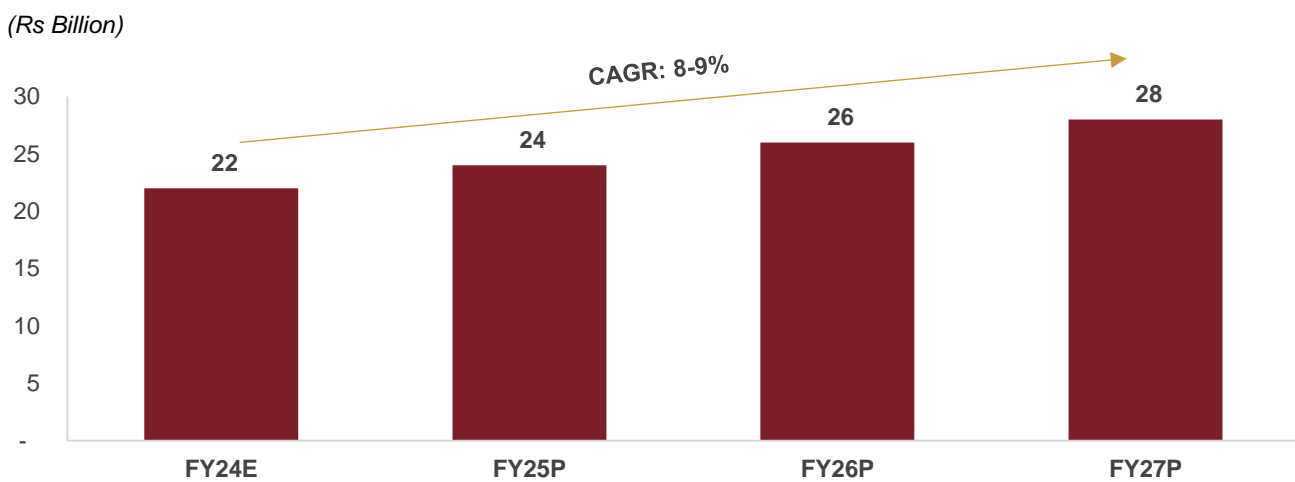
**3.2 Indian wear plates market**

Wear plates serve as a safeguard to vulnerable surfaces from harsh abrasion or impact, when encountering other surfaces. Key application of wear plates is where friction between two components or material leads to deterioration. As these plates are replaceable components, they protect value equipment against excessive wear and potential damage. Wear plates are used in a variety of industries, such as construction, mining, energy and power, railways, and quarries, as these plates reduce downtime from damaged equipment, cost of part replacements and maintenance for the uninterrupted use of equipment and machines. Key players operating in the wear plates market in India are Jindal Steel, AM/NS and Diffusion Engineers.



### 3.2.1 Market size of wear plates market in India

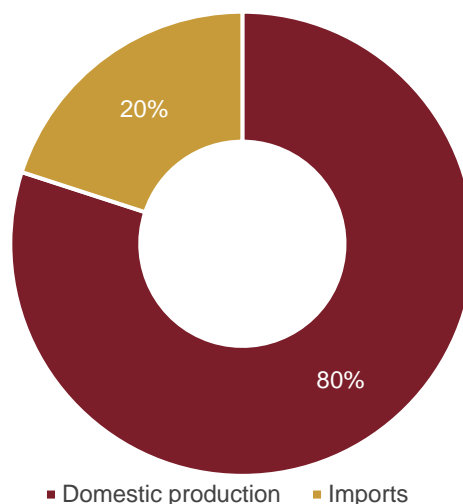
The wear plates market in India is estimated at around Rs 22 billion in fiscal 2024 and is expected to grow at a CAGR of 8-9% to ~Rs 28 billion in fiscal 2027. Wear plates are an essential part of various industries, such as power plants, steel mills, quarrying and cement, as these plates protect key components of these industry. As India continues to undergo rapid industrialisation, each of these industries would grow and require wear plates to protect their equipment and machinery. Additionally, as investments in the Indian infrastructure market will grow, the construction industry will promote the consumption of wear plates for long and durable equipment and machines. Also, increased focus by the mining industry to improve the lifespan of mining equipment will also lead to a stronger the wear plates sector.



Note: E — estimated, P — projected  
Source: CRISIL MI&A

Other key industries where wear plates are used, such as cement and power, saw a rise in investments in fiscal 2023. Investments in these sectors, due to a rise in infrastructure and demand for power, created a lot a demand for the wear plates sector. Machinery in powerplants and cement industries use wear plates in maintenance as well in in setting up of new plants to promote a longer lifespan of the plant equipment.

#### Wear plates market in India split by domestic production and imports, FY24E



Source: CRISIL MI&A

Indian domestic consumption of wear plates in fiscal 2024 was met by 80% domestic production and 20% by imports. A few years ago, the contribution of imports in the market was higher, but with the rise in the number of Indian manufacturers of wear plates, the sector's imports declined. CRISIL expects a further rise in domestic production, with even lesser share of imports in the sector.

### **3.2.2 Recent trends in wear plates market**

Utilisation of wear plates extends the operational lifespan of business materials, leading to a substantial increase in business profitability. Following are the key emerging trends in the wear plates sector:

#### **1. Laser shock processing**

This is one of the key technological trends in the wear plate sector. This technique involves generating and manipulating shockwaves in metallic materials, thereby improving surface properties to combat crack growth, wear, and stress corrosion cracking. By employing computational models, this method optimises the entire design and production processes, ultimately producing industrial wear plates with exceptional resistance.

#### **2. Use of wear resistant coatings**

Though majority of wear plate manufacturers use cold spray process, achieving the desired volume ratio of hard materials within the wear-resistant coating materials poses a challenge. Developments in coating powders and high particle velocities enabled increased incorporation of hard materials, resulting in coatings with higher hardness and improved wear performance.

#### **3. Rising demand from OEMs**

Original equipment manufacturers (OEMs) are increasingly favoring wear plates over traditional alternatives. The shift is driven by the superior performance and enhanced durability of wear plates, which lead to improved equipment lifespan and reduced maintenance expenses. This growing preference highlights the significant advantages wear plates offer in various industries and applications.

## 4. Assessment of heavy engineering capital goods industry

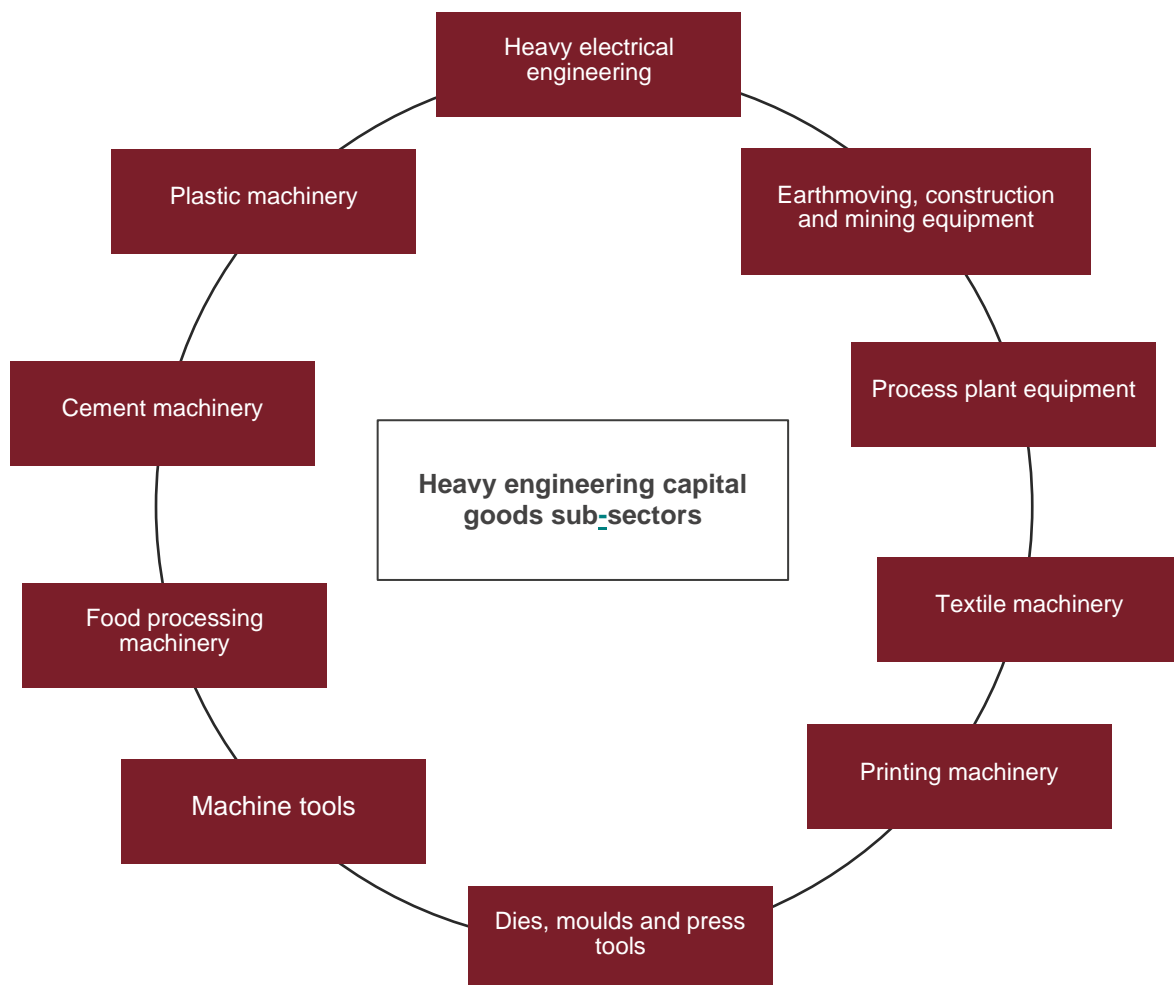
**Domestic heavy engineering capital goods industry estimated at Rs 3,100-3,200 billion as of fiscal 2024**

India's engineering sector is divided into two segments: heavy and light engineering. This classification is based on the nature of the product and the technology used for processing. Heavy engineering includes manufacturing and assembly of industrial machinery and plant equipment for various end-use sectors.

Equipments are designed and manufactured to suit end-use applications for industries such as fertilizer, textile, chemical, refinery, petrochemical, and oil and gas, as well as for the thermal and nuclear power sector.

On the other hand, light engineering includes sub-sectors, manufacturing everything from basic to sophisticated equipment. Light engineering products (components, parts, and small equipment) find application in automobiles, industrial machinery, power, oil and gas, fertilizers, steel, refineries, petrochemicals, cement, and railways sectors; and serve as inputs for the heavy engineering capital goods sectors.

**Heavy engineering capital goods industry in India includes the following sub-sectors, as per CRISIL**



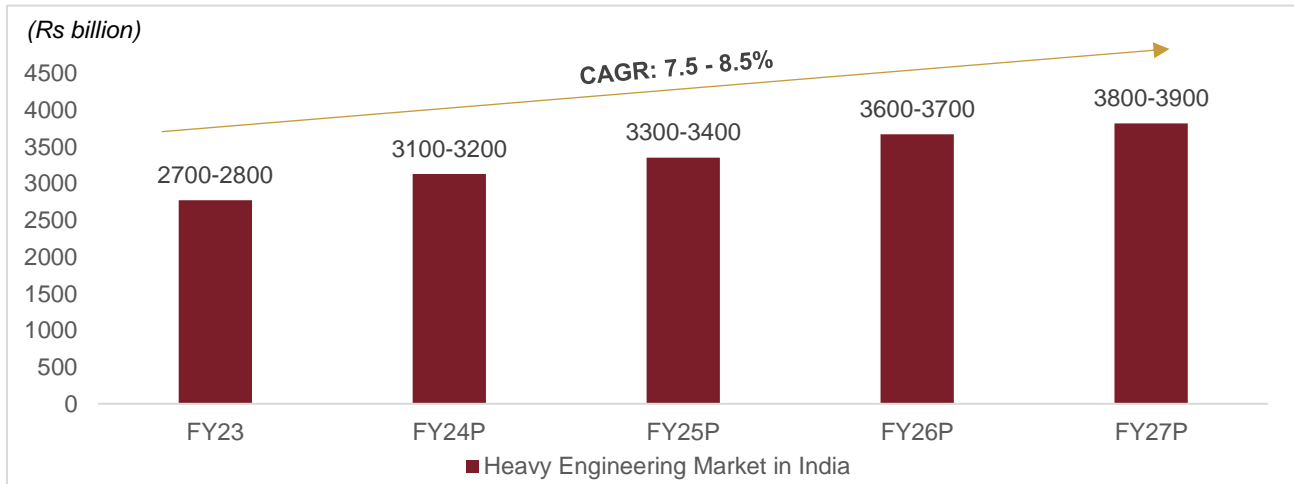
**Overview of key sub-sectors**

Sub-sector	Overview
Heavy electrical engineering	<ul style="list-style-type: none"> <li>A key manufacturing sector, catering to the needs of the energy, power and other industrial sectors</li> <li>Major equipment, like boilers, generators, turbines, transformers, and switch gears and related accessories, are manufactured in this sector</li> <li>The performance of this sector is closely linked to the country's power capacity addition programme</li> </ul>
Earthmoving, construction and mining equipment	<ul style="list-style-type: none"> <li>Manufactures backhoe loaders, compactors, mobile cranes, pavers, batching plants, crawler crane, transit mixer, concrete pump, tower cranes, hydraulic excavators, dumpers, mining shovel, walking draglines, dozers, wheel loaders, graders, drilling equipment, tunnelling machine, etc</li> </ul>
Process plant equipment	<ul style="list-style-type: none"> <li>Caters to industries such as oil and gas, chemical, pharmaceuticals, fertilisers, etc</li> </ul>
Textile machinery	<ul style="list-style-type: none"> <li>Majority of textile machinery manufacturers in the country are small and medium enterprises (SMEs)</li> <li>Key textile machines: weaving, spinning, winding, processing and synthetic fibre machines</li> <li>High-end technology machines other than in the spinning segment are mostly imported</li> </ul>
Printing machinery	<ul style="list-style-type: none"> <li>Majority of printing machinery manufacturers are SMEs</li> <li>Key printing machines: web offset printing, UV coating curing, flexographic printing, screen printing, wire stitching and lamination machines</li> </ul>
Dies, moulds, and press tools	<ul style="list-style-type: none"> <li>Consists of commercial tool makers engaged in design, development, and manufacturing of tooling in the country. Along with commercial tool makers, several government tool rooms-cum-training centres are also operational</li> <li>Key tool room locations: Mumbai, Bengaluru, Chennai, Pune, Hyderabad, and Delhi NCR</li> </ul>
Machine tools	<ul style="list-style-type: none"> <li>Supplies machinery to the entire manufacturing sector. It is dominated by SMEs with an annual turnover ranging Rs 3-5 billion</li> <li>Machine tools currently manufactured are general/special purpose machines, standard computer numerical control (CNC) machines, gear cutting, grinding, medium size machines, electrical discharge machining (EDM), presses, press brakes, pipe bending, rolling, and bending machines</li> </ul>
Food processing machinery	<ul style="list-style-type: none"> <li>Dominated by SMEs</li> <li>Key machines: peelers, sorters, graders, pulpers, grinders, mixers, cookers, fryers, dryers, pulverisers, soymilk machines, food grain and coffee millers, ovens, forming-filling- sealing machine, milking and dairy machines, and juicers</li> </ul>
Cement machinery	<ul style="list-style-type: none"> <li>India is the world's second-largest cement producer after China, with ~8% share in global cement production and cement capacity of ~569 million tonne as of fiscal 2022</li> <li>Cement manufacturing machines include raw mill, cement crusher, cement mill, cement kiln, cement cooler, cement dryer, cement silo, and cement packer</li> </ul>
Plastic machinery	<ul style="list-style-type: none"> <li>Key machines: injection moulding, blow moulding and extrusion moulding machines</li> </ul>

Source: Ministry of Heavy Industries, CRISIL MI&A

#### 4.1 Domestic Heavy engineering capital goods industry projected to grow 7.5-8.5% over fiscals 2023-27

Market size of Heavy engineering capital goods Industry in India, FY23 to FY27



E: Estimated; P: Projected

Source: Ministry of Heavy Industries, IEEMA, CRISIL MI&A

India's heavy engineering capital goods industry is estimated to be Rs 3,100-3,200 billion as of fiscal 2024, and is projected to clock a CAGR of 7.5-8.5% over fiscals 2023-27 to reach Rs 3,800-3,900 billion. Heavy electrical engineering, earthmoving, construction and mining machinery, and process plant equipment are the largest segments. The industry is expected to continue to expand on the back of rising manufacturing and construction activities.

Technological advancements, foreign direct investment (FDI), and strong government initiatives are the key growth drivers of the manufacturing sector, which will propel the heavy engineering capital goods industry as well. We expect demand for heavy engineering components to get a boost from end-use sector growth on account of improvement in the ease of doing business, the Production Linked Incentive (PLI) scheme, as well as investments in infrastructure and supportive government policies. Rising demand from key end-use sectors and material capacity addition in the cement sector will further support growth.

#### 4.2 Greenfield and brownfield capacity expansion to drive demand in the medium term

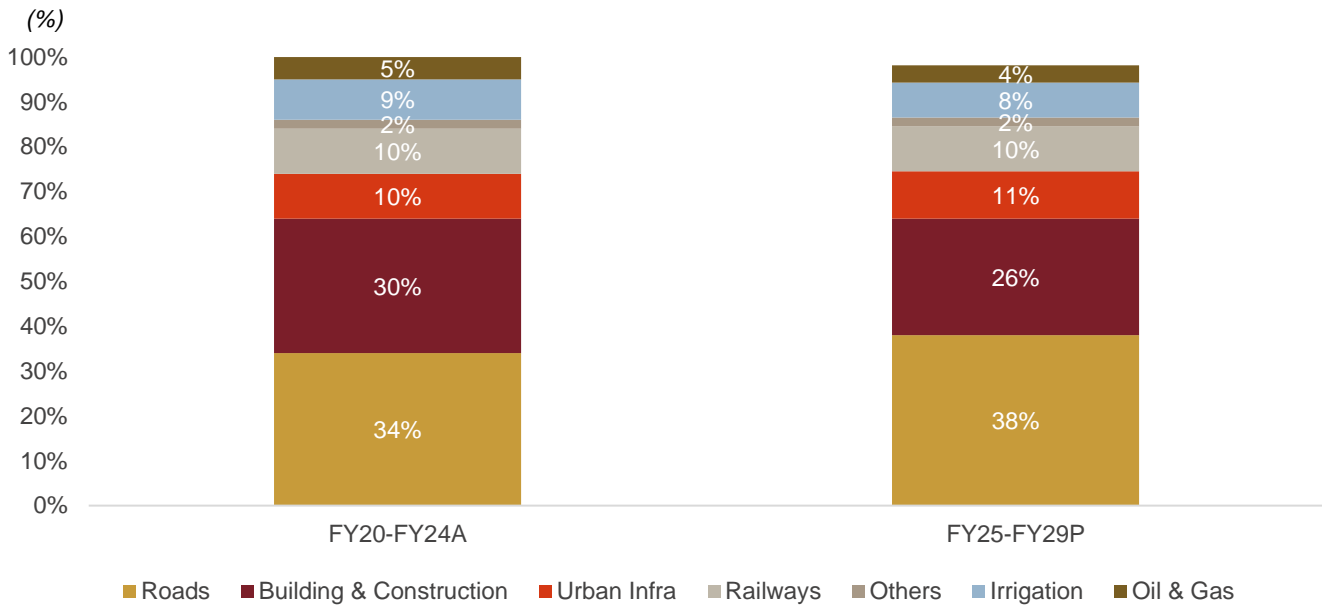
The heavy engineering capital goods sector, being closely associated with the manufacturing and infrastructure sectors, is of strategic importance to gauge the health of the economy. Growth in the manufacturing sector is tied to sectors such as infrastructure, power, steel, automotive, oil and gas, consumer durables, etc. Demand for heavy engineering plant and equipment components comes from capacity additions in textile, consumer product manufacturing, power, mining, oil and gas, refinery, steel, and automotive and other industrial segments.

Growth in construction spend will be propelled by the infrastructure segment over the medium to long term, as the building construction and industrial sector records sedate growth rate.

For the industrial sector, spending will be driven by the PLI scheme, a time-bound scheme by the Government of India that rewards companies in the range of 5-15% of their annual revenue based on the companies meeting pre-

decided targets for incremental production and/or exports and capex over a base year. The same will translate into increased demand for heavy engineering capital goods.

**Construction spends – fiscal 2020 to 2029**



Note: A: Actual; P: Projected  
Source: CRISIL MI&A

**Capacity additions in the conventional power generation segment expected to increase to 44-45 GW (excluding renewables) over fiscals 2025-29**

Capacity additions in the conventional power generation segment are expected to increase to 44-45 GW (excluding renewables) over fiscals 2025-29, driven by higher-than-decade average power demand. Fresh project announcements are limited as players are opting for the inorganic route for expansion given the availability of assets at reasonable valuations, with 4.8 GW of stressed power assets awaiting debt resolution.

Consequently, CRISIL MI&A expects 50-52% of the 44-45 GW conventional capacity additions over fiscals 2025 to 2029 to be coal-based, led by a large number of planned projects and the fact that coal remains the most widely available among the conventional sources of power. Nuclear power capacity additions of 4.5-5.5 GW are expected to come up during the period as ongoing projects at Kalpakkam, and Rajasthan are nearing completion. Also, hydropower and Pumped Storage Projects (PSP) capacity additions are expected to be between 7.5-8.5 GW and 8.5-9.5 GW between fiscal 2025-2029 respectively with clean energy status expected to enhance government push for clearances and construction cycles.

The contribution of the private sector, being riddled with debt from past capacity additions, is likely to remain low over the next five years, largely limited to potential acquisition of stalled under-construction coal projects in the absence of new project announcements. Central and state sectors are expected to drive capacity additions, accounting for majority of the conventional capacity additions.

India’s Installed generation capacity across fuels which stood at 416 GW last fiscal is expected to reach ~480 GW in fiscal 2025, on the back of healthy renewable capacity additions. It is expected to reach 700-710 GW by fiscal

2029, as renewable capacity is expected to be ~340 GW. Growing need for energy storage systems is expected to drive the capacity additions of PSP and BESS over the next 5 years. PSP, which has an installed capacity of 3.4 GW as of fiscal 2024, is expected to grow at a CAGR of 29% between fiscal 2024-29 to reach 12-13 GW by fiscal 2029, whereas BESS, which would start commissioning only by fiscal 2025, is likely to see strong growth to reach 23-24 GW capacity by fiscal 2029, taking storage capacity to a cumulative 35-36 GW.

### 4.3 Positive policy and robust FDI support India’s engineering and manufacturing industries

The domestic engineering and manufacturing industries have attracted the interest of foreign players, as these enjoy advantages in terms of production cost, technology and innovation, as well as consumer demand. FDI in India has risen over the past five years. FDI, which brings in long-term capital for capex and supports revenue growth, increased 2.5 times over fiscal 2018-24 compared with fiscal 2013-17.

The government has encouraged foreign investments by permitting 100% FDI under the automatic route for the heavy engineering industry (except for countries with land borders with India). FDI in manufacturing segments will strengthen demand for heavy engineering capital goods. Further, the sector does not require an industrial license. Quantum of payment for technology transfer, design and drawing, royalty, etc. to the foreign collaborator is not restricted. There are no restrictions on imports-exports as well.

#### FDI inflows (Rs billion) – fiscal 2013 to 2024

Sector	FY13-17	FY18-24	Increase in FDI inflows (times)
Construction (infrastructure) activities	81	1,792	22.1
Electrical equipment	232	452	2.0
Power	269	489	1.8
Food processing	386	371	1.0
Industrial machinery	160	180	1.1
Textiles	86	145	1.7
Mining	83	91	1.1
Cement and gypsum products	173	65	0.4
Machine tools	21	27	1.3
Earthmoving machinery	14	15	1.0
Sugar	10	3	0.3
Total FDI inflows <sup>1</sup>	10,125	25,600	2.5

1: Total FDI inflows across all industries  
Source: DPIIT, CRISIL MI&A

### Supportive government schemes and policy intervention to boost heavy engineering sector

#### Overview of Production Linked Incentive (PLI) Scheme

Launched in March 2020, the PLI scheme focuses on 14 sectors with an incentive outlay of Rs 1.97 trillion (~\$ 26 billion) to strengthen the production capabilities of the economy. These sectors include auto components, automobile, aviation, chemicals, electronic systems, medical devices, metal and mining, pharmaceuticals, renewable energy, specialty steel, telecom, textiles and apparel, food processing, and white goods.

As many as 176 MSMEs – in sectors such as bulk drugs, medical devices, pharmaceuticals, telecom, white goods, food processing, textiles, and drones – have benefited from the PLI scheme.

Sectors that are covered by the PLI scheme and have seen an increase in FDI inflows over fiscals 2022-23 are drugs and pharmaceuticals (+46%), food processing (+26%), and medical devices (+91%). As of July 2024, 755 applications have been approved in 14 sectors. As per the economic survey 2023-24, investments worth of over Rs. 1.28 trillion were realized till May 2024, which has led to production/sales of ₹10.8 Lakh Crore and employment generation (direct & indirect) of over 8.5 Lakh. Survey states that the exports were boosted by Rs. 4 trillion, with significant contributions from sectors such as large-scale electronics manufacturing, pharmaceuticals, food processing, and telecom & networking products.

**Overview of key schemes for the heavy engineering capital goods industry**

Scheme	Overview
<p><b>Scheme for Enhancement of Competitiveness in the Indian Capital Goods Sector - Phase I</b></p>	<ul style="list-style-type: none"> <li>• Launched in November 2014, the objective of the scheme was to address various constraints faced by the sector</li> <li>• Advanced Centres of Excellence were set up at IITs, IISc and CMTI in partnership with the industry to develop strategic technology and machinery</li> <li>• 4 Industry 4.0 Centres are imparting awareness and support to MSMEs for smart manufacturing capabilities, 15 common engineering facilities centres have been created for high tech-skilling and a 530-acre specialized Machine Tool Industrial Park has been established</li> <li>• Under this scheme, 33 projects with budgetary support of Rs 5.83 billion and a total outlay of Rs 9.96 billion were sanctioned. These aimed at addressing technology gaps, infrastructural requirements, and developmental needs of the sector</li> </ul>
<p><b>Scheme for Enhancement of Competitiveness in the Indian Capital Goods Sector - Phase II</b></p>	<ul style="list-style-type: none"> <li>• The phase II was launched for aiding Common Technology Development and Services Infrastructure. The scheme has a financial outlay of Rs 12.07 billion with budgetary support of Rs 9.75 billion, and industry contribution of Rs 2.32 billion</li> <li>• The scheme is an extension of phase I. A total of 27 projects with project cost of Rs 9.1 billion have been approved so far under the Phase-II</li> <li>• This phase has the following six components:               <ul style="list-style-type: none"> <li>– Identification of technologies through technology innovation portals (TIPs)</li> <li>– Setting up of new advanced CoEs and augmentation of the existing centres</li> <li>– Promotion of skilling in the capital goods sector – creation of skilling packages</li> <li>– Setting up of common CEFCs and expansion of the existing centres</li> <li>– Expansion of the existing testing and certification centres</li> <li>– Setting up of industry accelerators for technology development</li> </ul> </li> </ul>

Source: Ministry of Heavy Industries, CRISIL MI&A



## 5. Key growth drivers supporting the heavy engineering capital goods, welding consumables and wear plates industries in India

### 5.1 Stable contribution of manufacturing sector in overall GVA to support growth of heavy engineering capital goods, welding consumables and wear plates industries in India

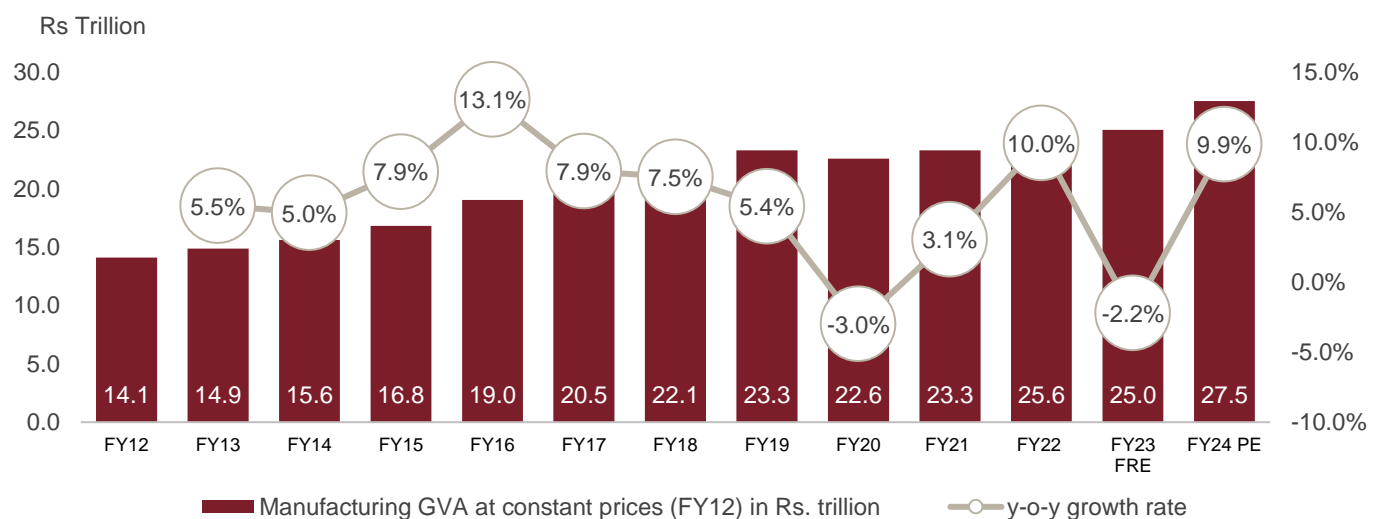
Contribution from the manufacturing sector in total GVA at basic prices decreased slightly from 17.4% in fiscal 2012 to 17.3% in fiscal 2024, logging a CAGR of 5.7% from fiscal 2012 to fiscal 2024. Domestic demand remains the primary driver of the growth in manufacturing, supported by capex push and easing inflationary pressures on consumers.

Manufacturing	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23FRE	FY24PE
Manufacturing contribution (% of GVA)	17.4%	17.4%	17.2%	17.3%	18.1%	18.1%	18.4%	18.3%	17.1%	18.4%	18.5%	16.9%	17.3%

FRE: First revised estimate, PE: provisional estimate

Source: MOSPI, CRISIL MI&A

#### Manufacturing GVA at constant prices (FY12 base year)



Source: MOSPI, CRISIL MI&A

## 5.2 Rising demand from key end-use industries to support demand for heavy engineering capital goods, welding consumables and wear plates

Sector	Key trends
<b>Steel</b>	<ul style="list-style-type: none"> <li>In fiscal 2024, steel sector experienced strong demand from allied sectors and from the support of the government's capital spending drive. Steel demand was being driven by the infrastructure boom in roads and railways. As FY24 was a pre-election year, the government's capital expenditure surge in infrastructure initiatives drove the on-year growth of 14%.</li> <li>Steel demand in fiscal 2025 is expected to increase by 7-8% on year due to the demand growth moderation in the first half, followed by an uptick in the later half.</li> </ul>
<b>Power</b>	<ul style="list-style-type: none"> <li>In fiscal 2024, power demand surged by 7.4% despite a high base of 9.6% recorded in fiscal 2023. The growth was driven by El-Nino led warmer temperatures along with a 7.6% growth in GDP.</li> <li>Power demand is projected to clock a CAGR of 5-7% between fiscal 2024-2029, supported by economic growth recovery and improved reach and quality of power supply</li> </ul>
<b>Cement</b>	<ul style="list-style-type: none"> <li>Cement demand grew a healthy ~11% in fiscal 2024, supported by the infrastructure segment which had been the major demand driver, led by central government's higher spending on key infra sectors ahead of elections.</li> <li>From fiscal 2025-2029, CRISIL MI&amp;A estimates the cement demand to log a CAGR of 6.5-7.5%, moderately higher than ~6% CAGR in the previous five years (fiscals 2020 to 2024), driven by a raft of infrastructure investments and healthy support from housing demand.</li> </ul>
<b>Auto components</b>	<ul style="list-style-type: none"> <li>The auto components industry saw a 9% growth in fiscal 2024, buoyant demand from OEM segment.</li> <li>In fiscal 2025, the industry revenue is poised for 8-10% growth, led by Two-wheelers, Passenger vehicles and tractor segment.</li> </ul>
<b>Construction equipment</b>	<ul style="list-style-type: none"> <li>In fiscal 2024, the construction equipment industry showed a whopping 25% rise driven by a 24% growth in volume. The volume sold hit an all time high with rising infra and mining activity in the backdrop coupled with newer machinery complying to the BS-IV norms introduced in the market.</li> <li>For fiscal 2025, volume growth projected is 8-10% owing to volume growth normalization but the industry is expected to maintain high levels of 100K+ in volume sales with growing end user industry segments like roads, railways and urban infrastructure.</li> </ul>
<b>Sugar</b>	<ul style="list-style-type: none"> <li>Industrial consumption that accounted for ~65% of total domestic sugar consumption in sugar season 2023 (October-September) is expected to rise a steady 3% each in 2024 and by 2% in 2025 seasons, led by a pick-up in demand from segments such as hotels, restaurants and cafes (HORECA), non-alcoholic beverages, and chocolates and confectionery</li> <li>Household consumption that accounted for ~35% of the total domestic consumption in the sugar season 2023 is expected to rise ~1.5% in 2024 and 2025 seasons owing to increasing population and because sugar is already a highly penetrated product.</li> </ul>

Source: CRISIL MI&A

## 5.3 Key government initiatives to further support growth in heavy engineering and capital goods, welding consumables and wear plates industries








**National Infrastructure Pipeline (NIP)** - The National Infrastructure Pipeline (NIP) planned for fiscals 2019-2025 is a government initiative to provide world-class infrastructure to citizens in a bid to improve their quality of life. It aims to improve project preparation and attract investments into the infrastructure sector. To draw up the NIP, a high-level task force was constituted under the chairmanship of the Secretary, Department of Economic Affairs (DEA), Ministry of Finance.

Lack of robust infrastructure is often recognised as the primary constraint to a developing nation's growth. In India, the government is taking various steps to forge partnerships between the public and private sectors to build

infrastructure. The NIP is a step in that direction. To achieve seamless working and productivity in other business sectors and India's ambitious goal to be a \$5 trillion economy by 2025, strong infrastructure growth is essential. In particular, *the success of India's manufacturing sector* and the focus on Make in India are directly influenced by how strong the backbone of India's infrastructure is. There is a constant need for government intervention, solid funding and constant monitoring of projects. Growing urbanisation, increasing working-age population, shift to a services-based economy and climate change are some of the factors that will give a further boost to India's infrastructure sector, in turn, amplifying the need for the NIP.

NIP was launched with 6,835 projects and has expanded to capture over 9,831 projects as of August 2024, with a total project outlay of \$ 2041.58 billion. Currently there are 1,992 projects under development spread across 59 sub-sectors.

**Overview of NIP opportunities in select sectors**

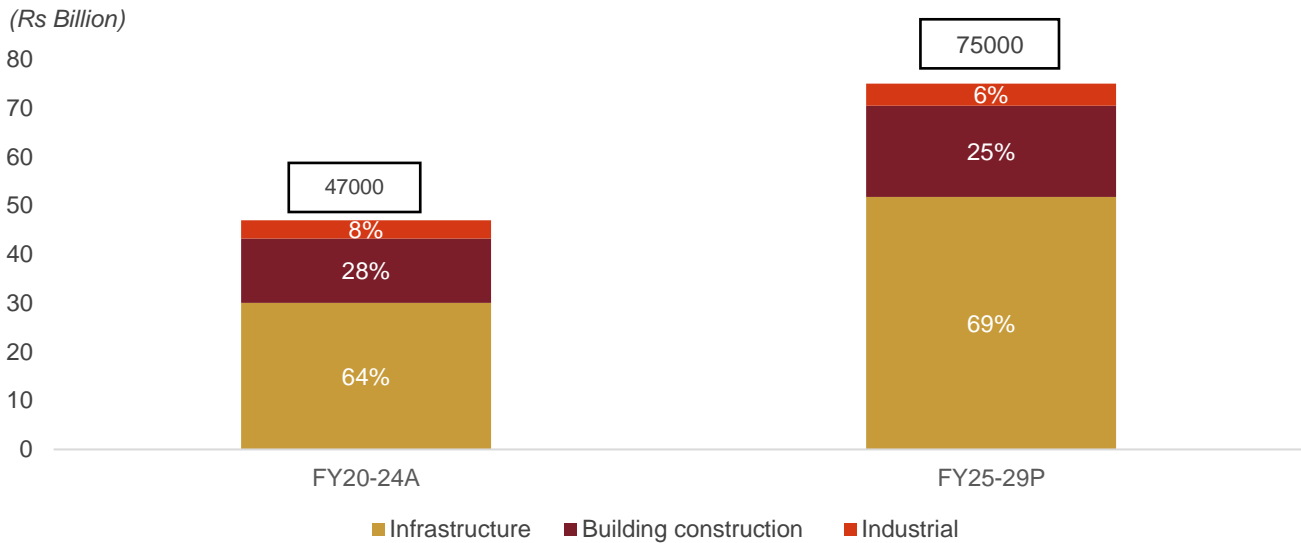
Sector		Number of opportunities / projects	Total worth of opportunities (USD billion)
Inland waterways		31	USD 13.75 billion
Logistics infrastructure		29	USD 5.26 billion
Electricity generation		378	USD 259.4 billion
Telecommunication		30	USD 34.19 billion
Steel		6	USD 2.86 billion
Oil & gas		156	USD 51.68 billion
Roads & highways		3,624	USD 404.83 billion

Source: NIP website as assessed on August 2024, CRISIL MI&A

**5.4 Increase in construction activities to boost welding consumables growth**

Rising urbanization, increasing disposable income and a growing economy are expected to lead to higher demand for housing and infrastructure projects, including airports, railways, bridges, roads etc., which, in turn, can increase construction and support demand for welding consumables.

**Overall construction investments**



Source: CRISIL MI&A

Construction sector is projected to grow at 7-9% in fiscal 2025 with major contribution by infrastructure segment given the rising investments and focus by central and state government capex coupled with schemes such as NIP, NMP and gati shakti initiatives on a rising pace.

Construction capex recorded to have risen by 13% on year in fiscal 2024 led by infrastructure segment to Rs 12 lakh crore. The rise is in keeping with the Govt’s focus on infrastructure as visible in rising central and state budget allocations to capex in order to meet the infra build out outlined in the NIP. In Fiscal 2025.

CRISIL MI&A expects the building and construction sector to grow 4-6% fiscal 2025 same as in fiscal 2024, with the real estate segment seeing a slowdown in demand because of a rise in inventory in key cities. The increase in execution of deferred projects and government schemes, such as PMAY, will support.

CRISIL MI&A expects construction investment in the industrial segment to grow at 4-6% and reach Rs. 0.8-0.9 lakh crore in fiscal 2025. The capex is expected to be majorly driven by Oil and Gas, Metal and Cement sectors in the next five years with sectors surpassing their average utilization levels.

The construction investment in the infrastructure sector is estimated to have grown at 16% CAGR from FY20-FY24 to reach Rs. 8 lakh crore. In fiscal 2025, it is expected to grow 8-10% to reach Rs. 8.5-8.8 lakh crore. Roads, urban infra, railways and irrigation sectors are expected to drive this growth. Public funds will continue to dominate the capex in the medium term.

Higher investments in infrastructure will support the demand for wear plates. Industries such as cement, steel, power etc. would see more investments in manufacturing plants to meet the growing demand for products used in infrastructure projects. These investments would also create demand for wear plates.

### **5.5 Rising demand for customisation**

Rising demand for customized products and solutions, driven by the need to meet specific and precise application requirements is expected to further drive growth for engineering equipment and wear plates sectors. As industries seek specialized solutions, the market for tailor-made products is expanding to cater to these diverse demands.

### **5.6 Repairs and maintenance**

Repair and maintenance of machinery, plant and construction equipment driven by higher utilization levels is expected to support demand for welding consumables.

## 6. Overview of key end-use industries

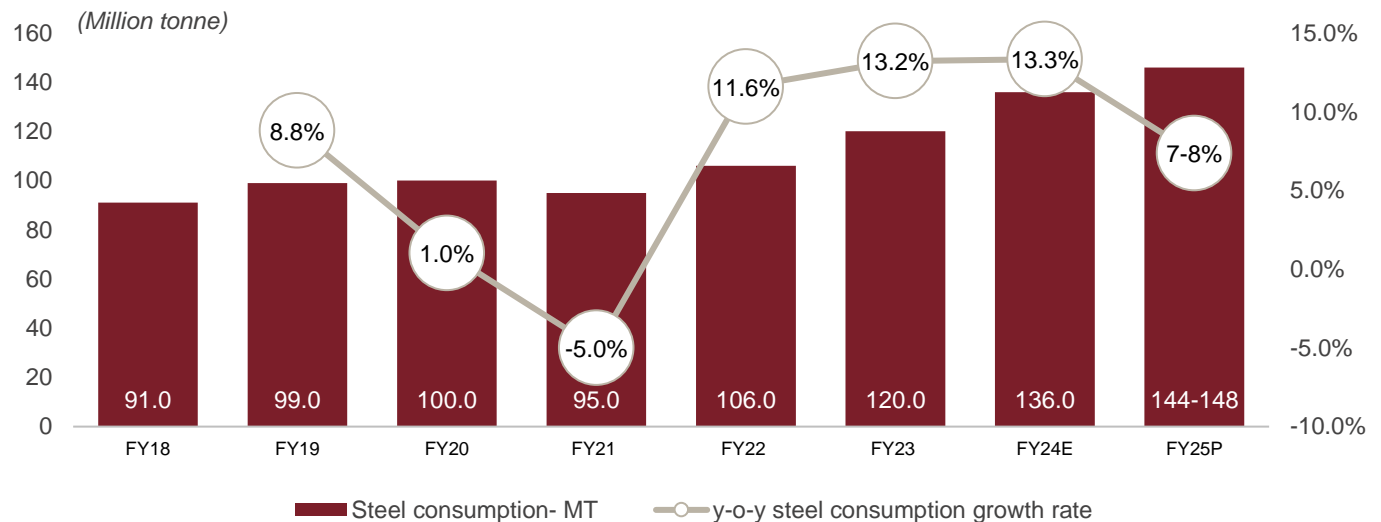
### 6.1 Steel Industry in India

Ever since the industrial revolution of the 18<sup>th</sup> century, steel has been crucial to economic growth. It finds applications in diverse sectors such as infrastructure, automobiles, manufacturing, and construction, greatly contributing to GDP growth.

In fiscal 2024, steel sector experienced strong demand from allied sectors and from the support of the government's capital spending drive. Steel demand was driven by the infrastructure boom in roads and railways. As fiscal 2024 was a pre-election year, the government's capital expenditure surge in infrastructure initiatives drove the double-digit growth in demand of 13.3%.

Steel demand in fiscal 2025 is expected to increase by 7-8% on year due to the demand growth moderation in the first half, followed by an uptick in the later half. Labour shortages and monsoons are expected to slowdown the pace of infra and construction activities in first half. Auto segment, primarily the steel intensive Medium and Heavy Commercial Vehicles (MHCV) is expected to witness slowdown in its sales which is going to be affected on account of the high tonnage sold over the preceding years.

#### Steel consumption in India

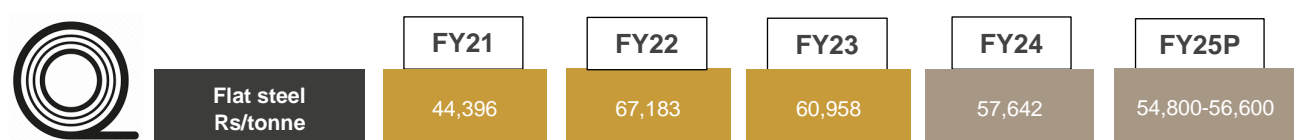


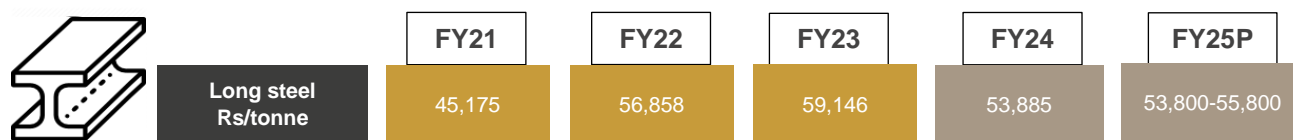
Note: E — estimated, P — projected

Source: CRISIL MI&A

The key end-use segments of the steel industry are building and constructions, infrastructure and automotive. The building and construction industry accounts for 30-35% of total steel demand, followed by infrastructure (25-30%) and automotive sector (11-13%).

#### Price variations across flat & long steel





Source: CRISIL MI&A

In FY24, flat steel prices corrected with the pressure from cheaper imports and muted, competitive global market. Prices have corrected by 5% on year. Flat steel prices averaged to Rs 57,642 per tonne in fiscal 2024.

While the long steel prices dipped by 9% on year. Cooling of raw materials caused long steel price corrections in FY24 despite the domestic demand staying strong. Long steel is domestic market dependent, unlike export-oriented flat steel. Long steel is dominated by secondary players and dependent on thermal coal for production. With increase in thermal coal output and softening prices, long steel prices will vary depending on the price delta between scrap and pig iron prices. Long steel prices averaged to Rs 53,885 per tonne in fiscal 2024 .

### Key trends and drivers of Indian steel industry

In FY25, with exports remaining muted and the influx of imports continuing, India is expected to remain a net importer. While potential production cuts in China remain uncertain and demand weak, CRISIL MI&A expects China's dominance in the export market with its competitive pricing to remain unchanged.

Reduced exports and an influx of cheaper imports impacted Indian steel prices in FY24. Lower than-anticipated demand in the Chinese domestic market forced Chinese mills to explore global markets, resulting in lower global price offerings. Cheaper imports and a competitive global market made India, a net importer.

In fiscal 2024, steel sector experienced strong demand from allied sectors and from the support of the government's capital spending drive. Steel demand was being driven by the infrastructure boom in roads and railways. As FY24 was a pre-election year, the government's capital expenditure surge in infrastructure initiatives drove the growth. Demand growth was around 14% on year. Healthy steel consuming segments like infra, automobiles, capital goods have supported the growth rate. Further, healthy urban housing progress ensured to push the demand for flats (in applications such as railings, doors, staircases, and outdoor construction)

## 6.2 Cement Industry in India

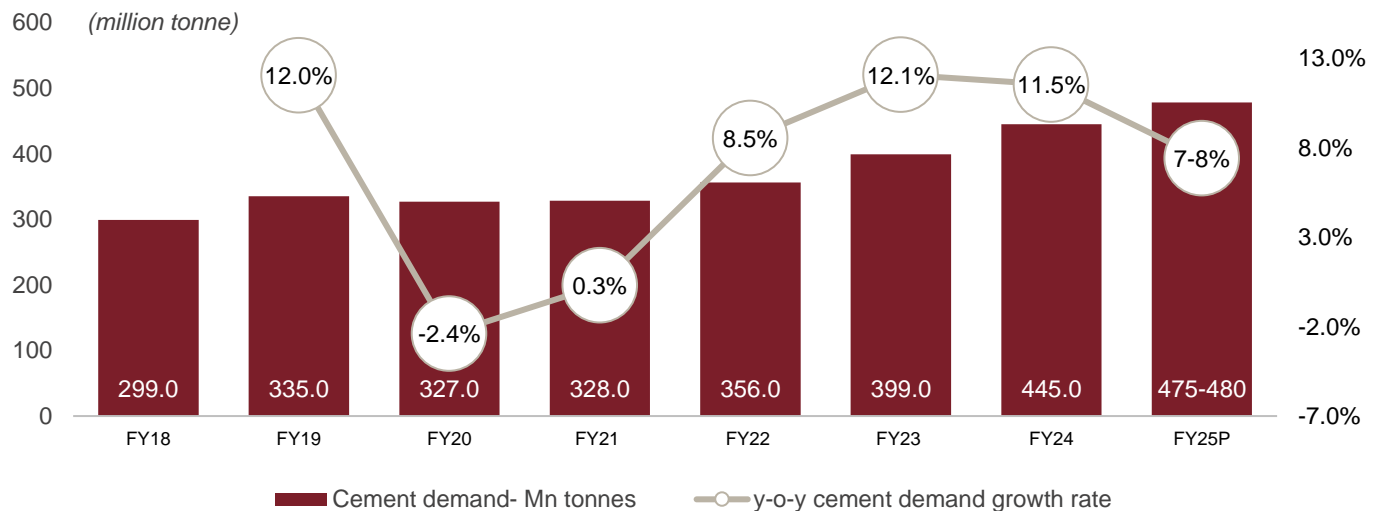
The cement industry, one of India's oldest sectors, plays a crucial role in the country's economic development and contributes significantly to the nation's GDP. In fiscal 2024, domestic cement demand was estimated at ~445 MT, up 11.5% on-year. For fiscal 2025, the growth is projected at 7-8%.

On two consecutive healthy bases, demand growth is expected to moderate to 7-8% in fiscal 2025. While the infrastructure segment is expected to remain the key demand driver, a marginal rise of 4% in capex for core infrastructure ministries for fiscal 2025BE over fiscal 2024RE is expected to slow down demand growth of the segment to 9-10% in fiscal 2025. That said, the moderation is on a high base and the overall quantum of capex allocation is still high. The government's focus on developing dedicated rail corridors for energy, mineral, and cement sectors, higher budget allocation for metro (~7.57% higher allocation in 2025BE over 2024RE), UDAN scheme for airports, expansion of metro rail and Nammo Bharat to more cities, ongoing NHAI and Bharatmala road projects should continue to support infrastructure demand. Demand from the housing segment is expected to moderate to 6-7% but to be driven by the rural housing segment owing to the expectation of healthy crop profitability on the back of above-normal monsoon predictions. Government focus on rural housing schemes in the

upcoming budget remains a key monitorable. Elevated but steady interest rates to support urban housing growth from the real estate segment. However, lower execution under PMAY-U (Pradhan Mantri Awas Yojana - Urban) is expected to restrict growth in fiscal 2025. Hence, demand growth for housing is likely to be moderate. Further, on three consecutive healthy bases, growth from the Industrial and commercial (I&C) belt is expected to slow down, however, production-linked incentive (PLI) scheme, traction in commercial real estate and rise in private investments to continue to support traction from the segment. As a result, at an overall level demand growth is expected to moderate to a 7-8% rate in fiscal 2025.

In fiscal 2024, the infrastructure segment had been the major demand driver, led by central government's higher spending on key infra sectors ahead of elections. In FY24, central government's capital expenditure had been ~28% higher for road ministry and ~52% higher for railways compared to previous fiscal. Capacity expansion plans of large players in capital-intensive sectors (steel and cement), implementation of the production-linked incentive (PLI) scheme, rising warehousing spaces and return to office/hybrid model drove demand from the industrial and commercial segments. On a high base of last fiscal, rural housing witnessed moderate growth momentum in FY24 due to impact of El Nino condition on agri profitability; although the rise in demand was supported by a higher shortage of houses and the government's push to attain a central scheme (PMAY-G) targets before elections. Growth from urban housing was supported by traction from real estate although growth was at a slower pace due to elevated interest rates and capital values. Also, the construction pace under PMAY-U slowed down as the scheme nears closure and the sanctions have already surpassed targeted levels. At an overall level, the pre-election boost to infra and housing and growth from I&C segment led to an overall rise of ~11% in fiscal 2024 despite high base of previous fiscal.

**Cement demand in India**



*P-Projected*  
Source: CRISIL MI&A

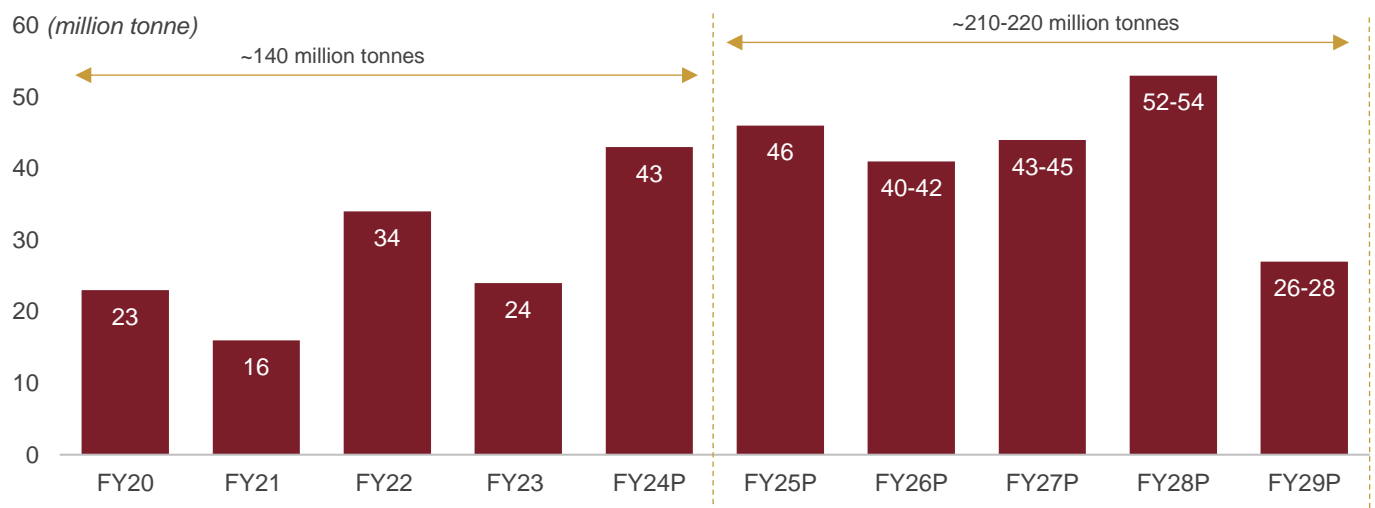
The end-use sector mix within the cement industry mainly comprises the housing (56-58%), infrastructure (29-31%), and industrial/commercial (13-15%) segments. Post-pandemic demand in the real estate and urban housing sectors shot up in fiscal 2021 as the work-from-home mandate boosted demand for space at home, income stabilised, customers started preferring home ownership to rental, and the cost of buying declined. The housing segment is expected to moderate over the next five years (fiscals 2025 to 2029), on a high base but will remain a key contributor backed by a lower concretization rate in the country.



### Cement capex

In fiscal 2024, the cement industry added ~43 million tonnes (MT), inclusive of grinding and integrated units, as against ~24 MT added in fiscal 2023, as players' profitability rebounded in lieu of easing cost pressures which in turn led to higher cash accruals for the capex spending during the fiscal. Going forward, fiscal 2025 is expected to witness a similar trend with further addition of ~46 MTPA. Over the near term, CRISIL MI&A estimates overall installed capacity to reach 678-683 MT as of fiscal 2025.

### Cement capacity addition



Note: P-Projected

Source: CRISIL MI&A

Improving demand outlook over the medium term and push to gain market share have triggered a wave of capacity addition announcements by cement manufacturers, especially large players. Over fiscals 2025-29, CRISIL MI&A expects the industry to add 210-220 million tonnes per annum (MTPA) of grinding capacities, taking the country's total installed capacity to 850-860 MTPA by fiscal 2029.

CRISIL MI&A expects the bulk of the capacities (~95%) up to fiscal 2029 to be added by large and midsize players, as these have better finances to sustain in challenging times. Large companies will be able to fund capex through internal accruals. Also, their comfortable gearing levels give them the financial flexibility to raise debt, if required.

### Key trends and drivers

- Housing:** Cement demand from housing to be driven by affordable and rural housing. As of May 2024, a total of ~28.1 million units have been sanctioned under the PMAY-G, of which, 26.2 million have been completed). As many as ~1.9 million units are under construction. Construction pace slowed down during the second half of fiscal 2024 as uneven and delayed monsoon impacted agriculture activities regionally. Execution pace under PMAY-G is expected to slightly moderate in the first half of fiscal 2025, due to fund diversion during elections, however, it is expected to ramp up in the second half of fiscal 2025. Also, an expectation of above normal monsoon is expected to aid agriculture profitability in the current fiscal. The announcement in Vote of account budget 2025, to bring 20 million additional houses under the ambit of PMAY-Gramin scheme over the next five years, to support demand from the housing segment in the long run. Hence, CRISIL MI&A expects cement demand growth from rural housing to witness 6.5-7.5% in fiscal 2025.

- **Infrastructure:** Within infrastructure, roads have been the largest contributor to cement demand, followed by railways, irrigation, and urban infra. Besides creating employment opportunities, capital spending for roads and highways results in a multiplier effect on several other sectors. The overall gross budgetary outlay for the Ministry of Road Transport and Highways doubled from Rs 1.28 lakh crore in fiscal 2019 to Rs 2.64 lakh crore in fiscal 2024RE. Against this backdrop, the roads and highways budgeted capex for fiscal 2025 has witnessed a sharp moderation in growth rate and is only higher by 3% vis-à-vis fiscal 2024RE.

In FY24, the Central government's capital expenditure has been ~28% higher for the road ministry and ~52% higher for railways compared to previous fiscal. Infrastructure is expected to continue its strong momentum, led by the government's spending, primarily across its flagship schemes, such as PM Gati Shakti and the National Infrastructure Pipeline. However, only a marginal rise of 4% in capex for core infrastructure ministries for fiscal 2025BE over fiscal 2024RE is expected to slow down demand growth of the infrastructure segment to 9-10% in fiscal 2025.

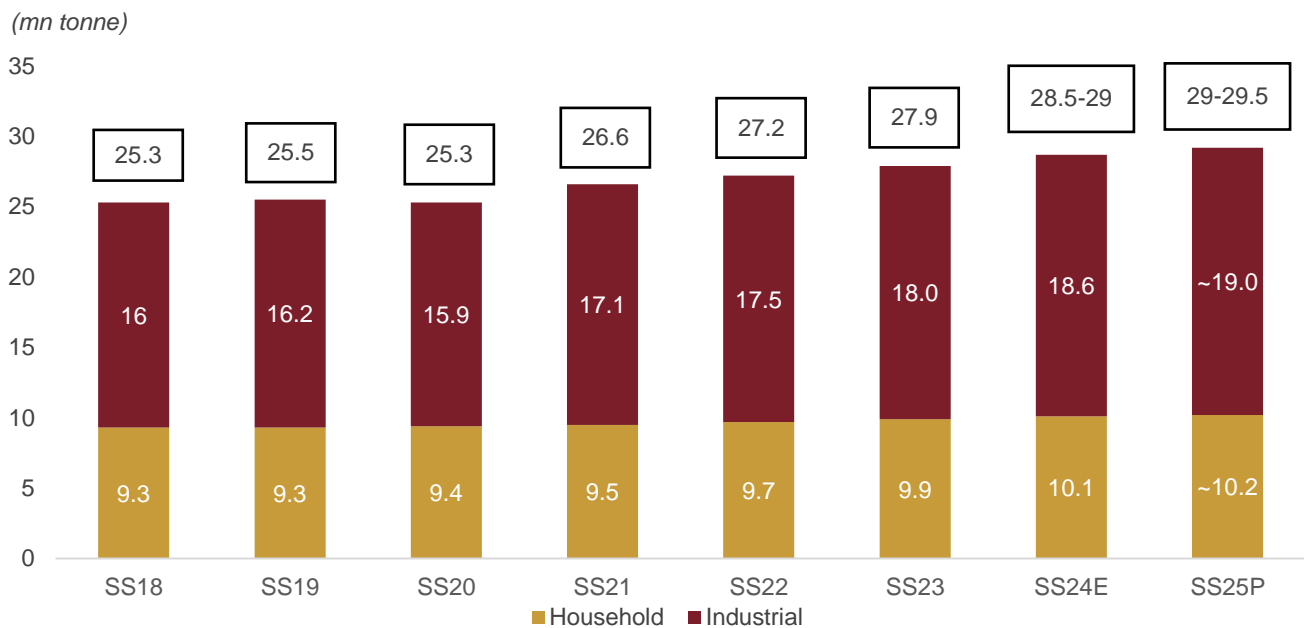
- **Industrial & commercial segments:** Cement demand from the industrial and commercial segments is expected to have grown by healthy 11-12% in fiscal 2024. Continued economic growth and softening commodity prices propelled players to go on a capex spree leading to healthy industrial growth during the fiscal. Further, on two consecutive healthy base, demand growth from I&C segment is expected to moderate but still grow by healthy 7-8% in fiscal 2025 supported by the implementation of PLI scheme, robust industrial capex, higher investments in warehouses and data centers and hybrid working model. Additionally, rising demand for commercial real estate owing to the development of IT/ITes industry, the establishment of MNCs & Global Capability Centres and corporate offices, etc will support demand growth in the long run.

### 6.3 Sugar Industry in India

The sugar industry is a crucial agro-based sector. It directly affects the livelihoods of approximately 50 million farmers and around 500,000 workers employed in sugar mills, primarily in rural areas. In sugar season 2025 (October-September), sugar consumption is expected to increase moderately by ~2% to 29-29.5 MT from 28.5-29 MT in sugar season 2024. Industrial consumption that accounted for ~65% of total domestic sugar consumption in Sugar season 2023 is expected to rise steadily by 3% in Sugar season 2024 and by 2% in Sugar season 2025, led by a pick-up in demand from the hotels, restaurants, and cafes (HORECA), non-alcoholic beverages, and chocolates and confectionery segments.

Household consumption that accounted for ~35% of total domestic usage in Sugar season 2023 is expected to rise by ~1.5% with increasing population in 2024 and 2025 seasons as sugar is already a highly penetrated commodity.

### Domestic sugar consumption



Note: E: Estimated, P: Projected  
Source: CRISIL MI&A

HORECA segment is the major driver for growth of sugar consumption at industrial level led by changing food habits and increasing social gatherings. Along with that, with increasing disposable income, consumption of soft drinks has increased. Finally, chocolates and confectionary are growing as a segment with premiumization in gifting. With this, industrial consumption is expected to grow at ~3% and ~2% for SS 2024 and SS 2025, respectively.

### Key trends and drivers in India's sugar industry

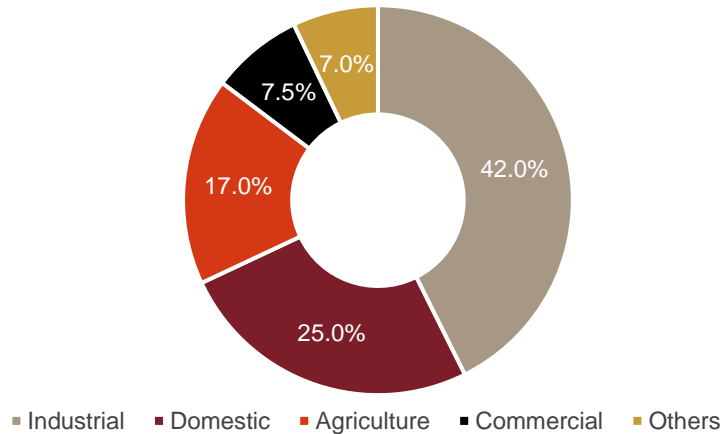
- HORECA segment is the major sugar consumer, led by changing food habits and increasing number of social gatherings
- Rising disposable income will lead to increased consumption of soft drinks, chocolates, and confectionary, and, therefore, demand for sugar by those sectors
- However, household demand will be determined by prices of alternative sweeteners, i.e., jaggery and khandsari, and growth in the country's population

### 6.4 Power industry in India

For India to sustain its economic growth trajectory, sufficient generation capacity and well-developed power infrastructure are critical. Power demand is closely linked to GDP growth where historically power consumption largely follows economic cycles. Power demand has historically lagged GDP growth by 1-2 percentage points but has bucked the trend consistently over fiscals 2021 to 2024, indicating the sustained momentum in consumption trends. In fiscal 2024, power demand surged by 7.4% driven by El-Nino led warmer temperatures along with a 7.6% increase in GDP growth despite a high base of 7.2% in fiscal 2023. CRISIL MI&A expects power demand to increase by 5.5-6.5% in fiscal 2025. This is expected to be driven by severe weather along with increase in economic output. Power demand is expected to reach 1,720-1,730 BU in fiscal 2025 after reaching 1,626 BU in fiscal 2024.

In terms of consumption, Commercial and industrial consumers dominate the power consumption in India accounting for nearly 50% of the total electricity consumed.

**Segment-wise power consumption in fiscal 2023E**



*Note: Industrial share includes captive power consumption by industrial units*

*Source: CEA, CRISIL MI&A*

In fiscal 2023, power consumption was dominated by the Industrial segment with a share of 42%. This was followed by domestic consumption at 25% and agriculture consumption at 17%.

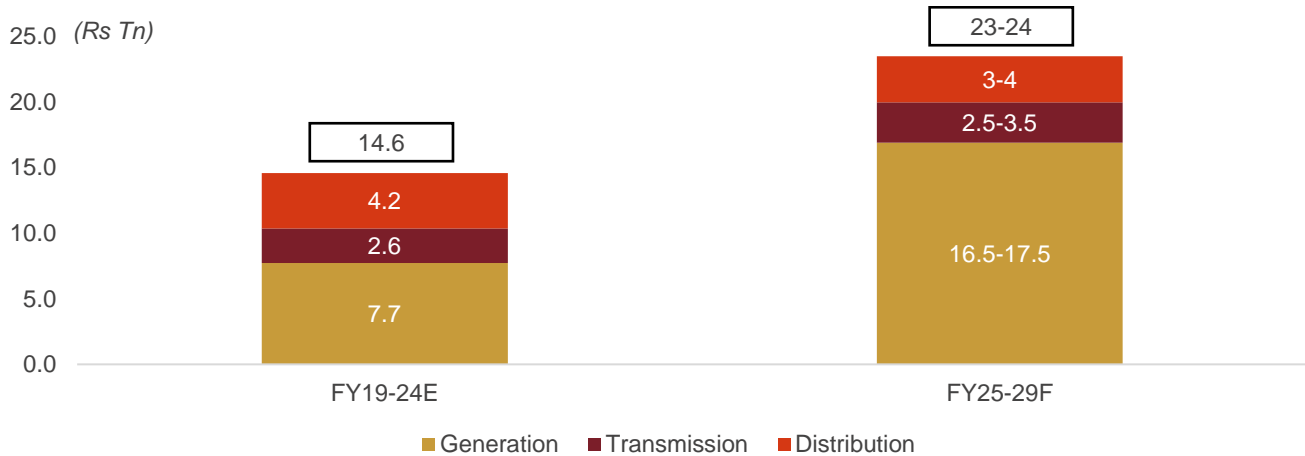
**Capital expenditure in Indian power industry**

CRISIL MI&A expects investments of Rs 23-24 trillion in the power sector between fiscal 2025-2029. Investments in power generation are expected to increase ~2.1 times from Rs ~7.7 trillion between fiscals 2019-2024 to Rs 16.5-17.5 trillion between fiscals 2025-2029. Investments in renewable energy generation capacity are expected to account for ~75% of these investments over the same period as India seeks to achieve its 500 GW of non-fossil energy capacity announced in COP26.

To achieve the RE generation target, strong transmission infrastructure is needed so as to integrate large scale RE capacities into the grid. This is expected to lead to transmission investments of Rs 2.5-3.5 trillion between fiscals 2025-2029 from ~Rs 2.6 trillion between fiscals 2019-2024 led by upcoming Inter State Transmission System projects.

Additionally, Rs 3-4 trillion worth of investments in the distribution segment is expected between fiscal 2025-2029 driven by upgradation of distribution infrastructure along with installation of smart meters as India focuses on reduction of its carbon emission.

**Segment-wise break-up of total investments**



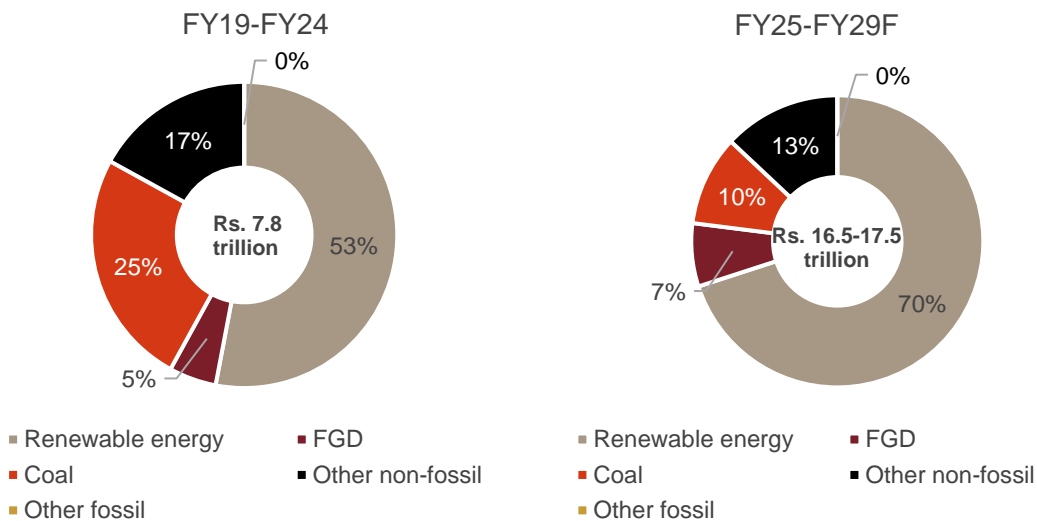
E: Estimated, P: Projected  
Source: CRISIL MI&A

**Renewable energy to account for majority share of power generation investments**

Over the next six years, investments in generation will be led by renewable energy capacity additions, followed by conventional generation and flue gas desulfurization (FGD) installations, as the shift towards clean energy generation gains momentum.

Capacity addition from renewable energy sources is expected to be 215-225 GW over fiscals 2025 to 2029, and 23-24 GW from coal based plants sources over the same period. Investments in RE capacity, which are expected to double over the next five years, in line with capacity additions, will constitute over 70% of overall generation investments. Total generation investments are expected to grow ~2x over fiscals 2025 to 2029 compared with fiscals 2019 to 2024

**Investment split across power generation sector**



Note: Other fossil fuels include lignite, gas, and diesel

E: Estimated  
Source: CRISIL MI&A

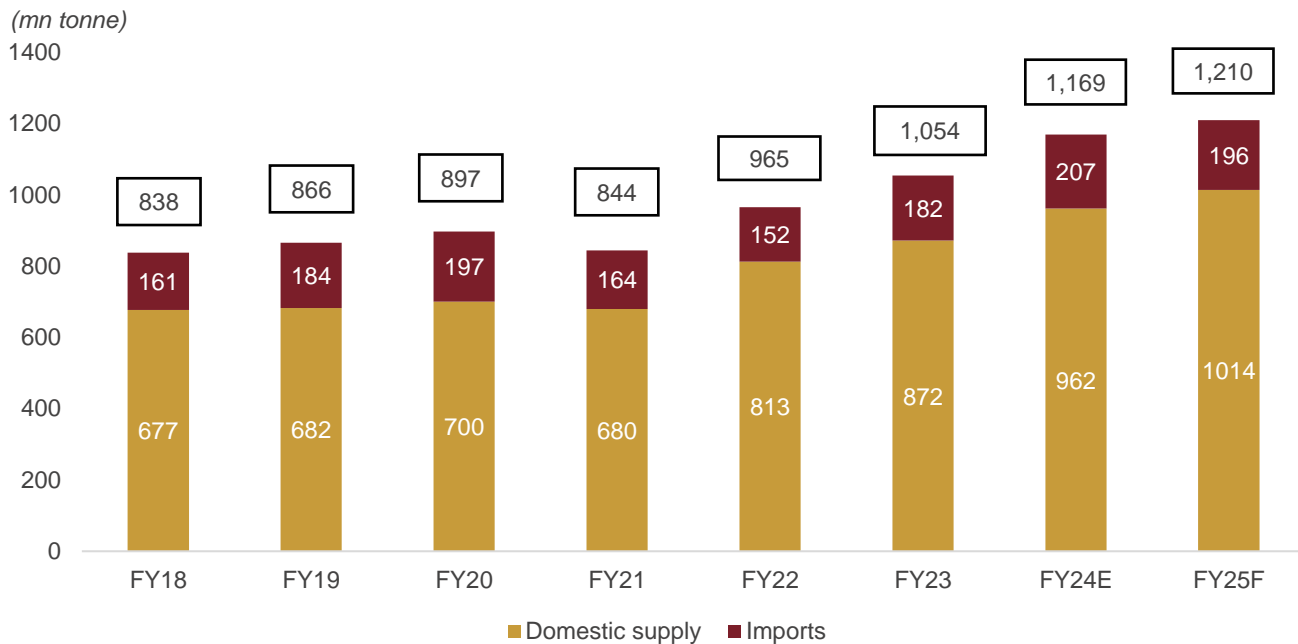
### Key trends and drivers in India's power industry

- **Macroeconomic factors:** Aatmanirbhar Bharat relief package, government spending on infrastructure through the National Infrastructure Pipeline, commissioning of dedicated freight corridors, expansion of the services industry, rapid urbanisation, and rising farm incomes from agriculture-related reforms are key factors increasing power demand. Also, policy initiatives, such as the PLI scheme and low corporate tax rates, among others, have supported large scale manufacturing in the country, further boosting power demand
- **Railway electrification:** Indian Railways (IR) is one of the world's largest rail networks. In a bid to become net zero emitter by 2030 the government aimed to achieve 100% electrification of Indian Railways by December 2023, however delayed electrification works due to pandemic induced lockdown coupled with sluggish pace of electrification hence CRISIL MI&A expects that 100% electrification will be achieved by fiscal 2025. This is expected to lead to an incremental power demand of approximately 23 BUs on an average every year between fiscal 2025 to 2029, also driven by new track laying by the IR which is already electrified. Ministry of Railways has been allocated a capital outlay of Rs 2.52 lakh crore in the Union Budget 2024-25. This is the highest ever allocation to the national transporter and continues on the trend followed last year with a gross budgetary support of Rs 2.4 lakh crore in fiscal 2023-24. This is expected to provide impetus to the sector in terms of creation of new lines, doubling existing lines and electrification of existing lines.
- **Metro projects:** The electricity consumption of the urban metro system mainly comes from electricity consumption for train traction and the electricity consumption for station operation. Metro rail has seen substantial growth in India in recent years, and the rate of growth is going to become twice or thrice in the coming years with multiple cities requiring the need for metro rail to meet daily mobility requirements. As of May 31, 2024, around 902 kms of metro routes are operational across 18 cities of India. Around 712 kms of metro line is under construction and 1,878 kms of metro lines are proposed further. Electricity consumption from the aforesaid categories is expected to add an average incremental power demand of 5-6 BUs every year between fiscal 2025 and 2029. Currently metro projects constitute a marginal share of the total incremental demand, but the share is expected to increase in the future due to a large quantum of planned metro projects.
- **Electric vehicles:** Under the National Electric Mobility Mission plan, the government is promoting EVs through demand-side incentives, in terms of subsidies, promoting setting up of charging infrastructure, and encouraging research and development in battery technology, power electronics, battery management, system integration, etc. CRISIL MI&A projects that, adoption of EVs will add upto 63 BUs of power demand between fiscal 2025 and 2029, an average of 12.5 BUs per year in the same period.

### 6.5 Coal industry in India

Coal is one of the key sources of energy in India. Within the space, non-coking coal demand in India was ~1,169 million tonne in fiscal 2024, with imports contributing ~207 million tonne to the total. In fiscal 2024, non-coking coal consumption rose ~11% on-year on a high base of fiscal 2023. Surge in power demand by 7.4% in fiscals 2024, have pushed demand for coal at all-time highs to ensure uninterrupted power supply in the country.

**Split of domestic supply and import of non-coking coal**



Note: F: Forecasted

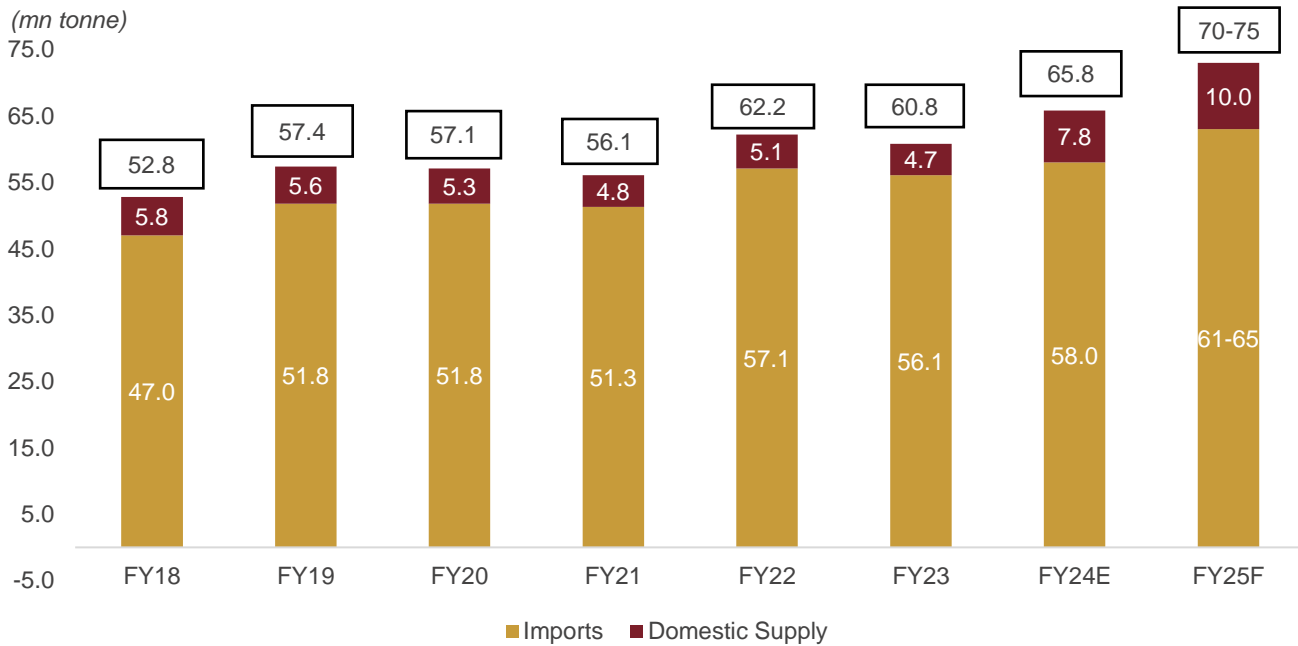
Source: Ministry of Coal, CRISIL MI&A

CRISIL MI&A expects non-coking coal consumption to increase by 3-4% on year in fiscal 2025. This comes on an estimated growth of 10.9% recorded in fiscal 2024. Coal based power generation accounts for ~70% of the total generation and a Y-o-Y surge in coal-based power generation of 10.3% in fiscal 2024 and 2.5-3.5% in fiscal 2025 is expected to push demand for coal

Coal capacity additions have seen an improvement in fiscal 2024 vis a vis fiscal 2023 as 5.2 GW of projects were added versus 1.4 GW in fiscal 2023. CRISIL MI&A expects additions to be 3.5-4.5 GW in fiscal 2025. CRISIL MI&A expects thermal coal consumption from captive power plants to rise by 2-3% in fiscal 2025 after an expected decline 2-3% in fiscal 2024. Captive power plants are owned by industrial consumers for their own use. With the rise of C&I segment in renewables, consumption of coal-based power generation is expected to decline.

In fiscal 2023, due to higher coal consumption by power plants along with logistical challenges, the coal supply crisis that ensued resulted in priority being given to commercial electricity coal-based power plant. This led to higher imports from captive power plants. However, as domestic supply along with inventory have recovered since H2 fiscal 2023, domestic supply to captive plants has also improved. In fiscal 2024, supply to captive has increased by 38.11% as compared to fiscal 2023 to 60.91 million tonnes. The trend continues as between April-May 2024 the supply to captive has increased by 28.17 % on year between same periods to 31.17 million tonnes.

**Split in domestic supply and imports for cooking coal**



P: Projected

Source: CRISIL MI&A

Crude steel demand in FY24 is mainly pushed up by construction, infrastructure and auto segments. Lack of coking coal reserves and other operational issues have kept domestic coking coal production low. To meet the rising demand, steel players have had to rely on imports, which are expected to rise to ~70-75 MT in fiscal 2025 from around ~66 MT in fiscal 2024.

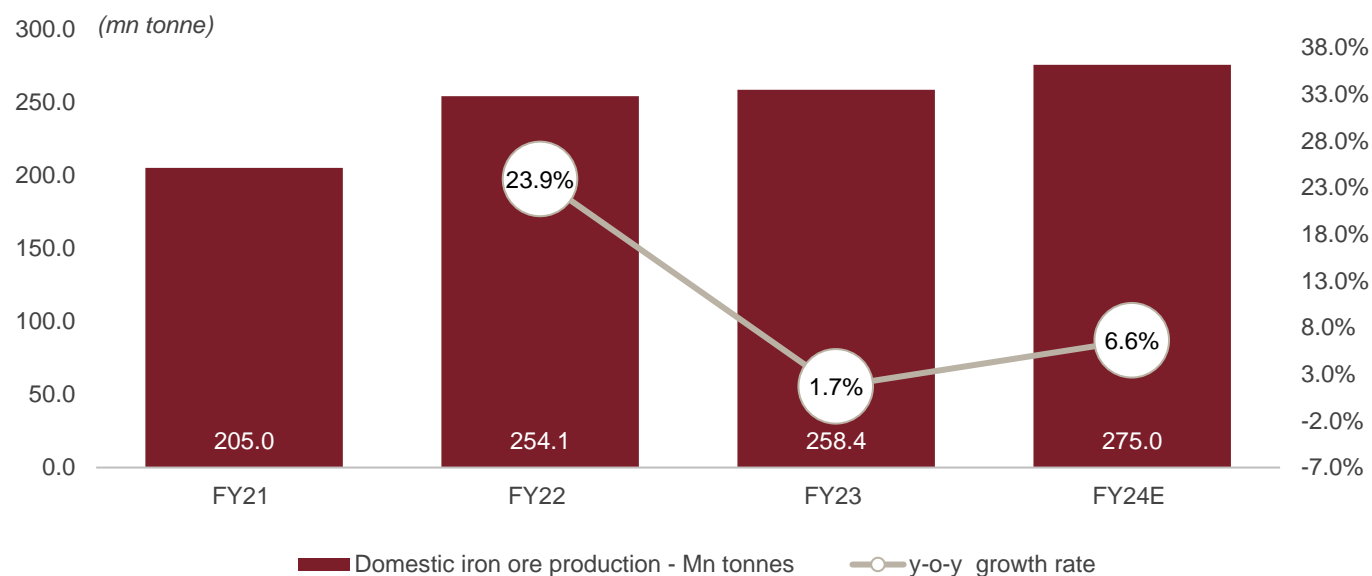
**6.6 Iron ore industry in India**

Iron ore is the basic raw material used in the manufacture of pig iron, steel, sponge iron and alloy steel. The iron ore mines are discovered through exploration; once the location, quality and quantity of the ore body along with its value is decided, extraction starts. Based on their excavation method, mining techniques can be classified into two main types: surface mining and underground mining. The mining techniques are decided on the basis of proximity of iron ore to the surface. Underground mining is used if the ores are deep inside the earth and surface/opencast mining if they are near the surface.

In fiscal 2024, India is estimated to have mined 275 MT of iron ore, of which ~234 MT was consumed domestically and ~46 MT was exported, with negligible imports, indicating sufficient domestic supply.



### Domestic iron ore production



E: Estimated

Source: CRISIL MI&A

In Fiscal 2024, iron-ore costs rose by 9% and domestic thermal costs fell by 32% impacting spreads. Spreads touched Rs 8,175 per tonne as a result of slashed thermal coal/sponge iron prices. In fiscal 2025, iron-ore costs are expected to rise and thermal costs/sponge iron prices to drop marginally. Spreads to remain flattish with fall in realizations and stable coal costs. CRISIL MI&A estimates the spreads to rise in FY26 as sponge iron prices increases.

In FY24, iron-ore prices increased on low base and touched Rs 4,544 per tonne, a rise of 12% on year. After export duty removal, iron-ore prices started rising. However, due to falling global iron-ore prices and weak steel markets prices started falling since May'23. Prices started rising in H2FY24 due to strong domestic and export steel demand.

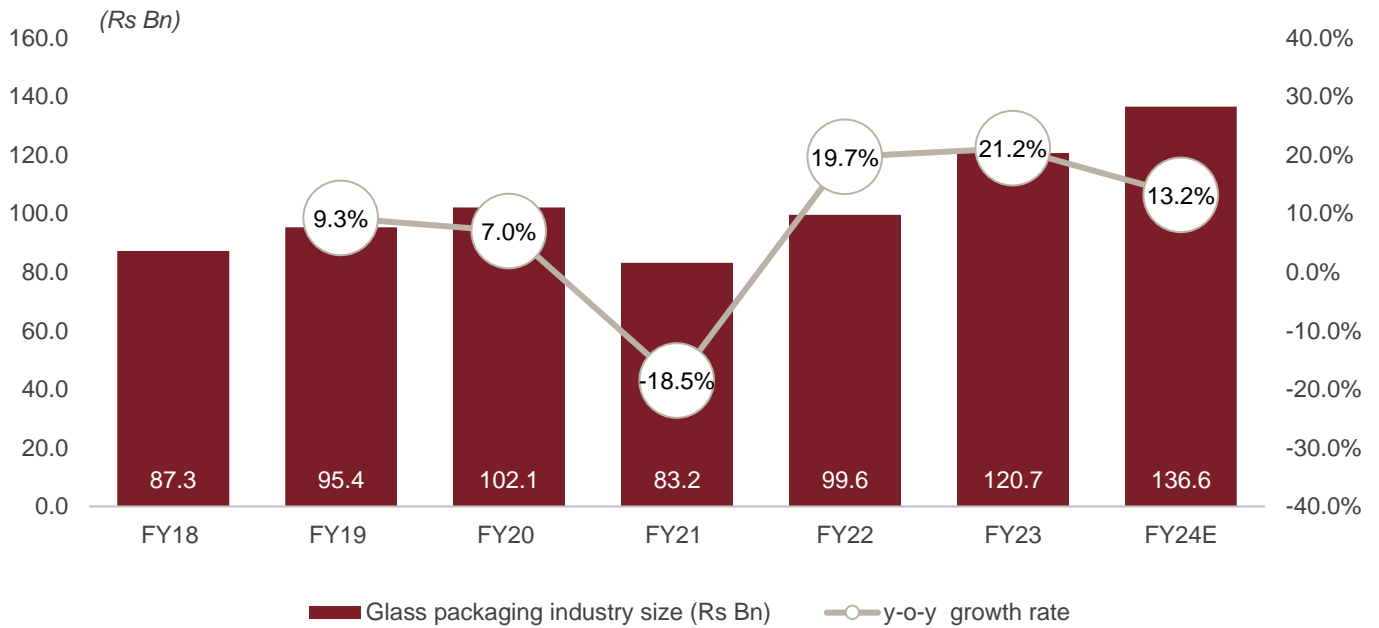
In FY25, iron-ore prices are expected to rise on low base to touch Rs 4,700-5,000 per tonne amid health crude steel production growth and improved export demand from India. In Q1FY25, iron-ore prices are estimated to have touched Rs 5,350-5,450 per tonne. Prices are expected to be healthy in Q2FY25 with reduced output amid disturbed mining activities in the monsoon season. Also, rising global ore prices supported price hikes in Q1FY25.

### 6.7 Glass packaging industry in India

Glass packaging is one of the ecofriendly solutions for packaging industry. Packaging made from glass is safe for environment, health, and taste. As glass is nonporous, the flavor of food products remain intact as no interactions happens between glass and products. The glass packaging can be used in variety of packaging applications as preprocessed glass can be bend into any shape.

Indian glass packaging industry was valued at Rs 120.7 Bn for fiscal 2023, growing at 21.2% y-o-y. For fiscal 2024, CRISIL MI&A estimates the market to have grown at 13.2% y-o-y growth to reach a value of Rs 136.6 Bn led by volume growth in alcoholic beverages.

**Glass packaging industry size**



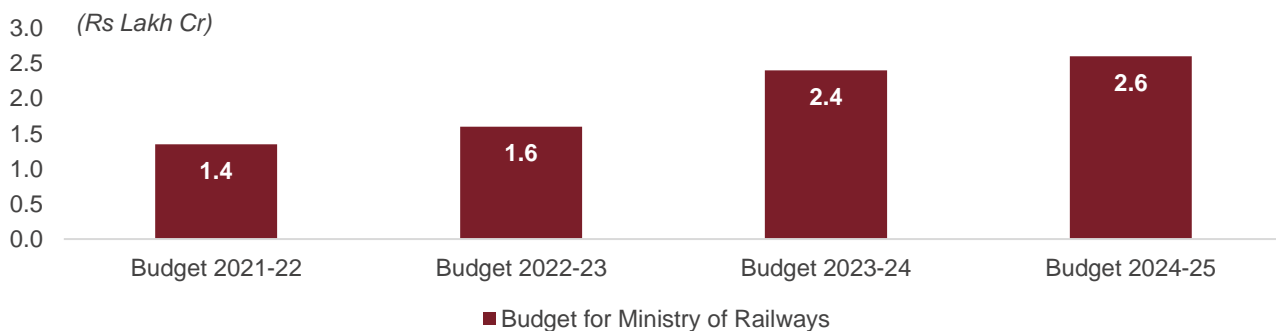
Source: CRISIL MI&A

Key end use industries for glass packaging sector are alcoholic beverages, food products, non-alcoholic beverages and pharmaceuticals. Among these key end use industries, alcoholic beverages and food product industries have majority share of 44-47% each. Non-alcoholic beverages industry occupies a market share of 5-10% while pharmaceutical industry has a market share of 0-5%. For fiscal 2024, CRISIL MI&A estimates the growth for the sector to be around ~ 13.2% which was driven by the alcoholic beverages industry, for which glass packaging is expected to remain the primary packaging material.

**6.8 Railways**

Railways plays a key role in growth of Indian economy as it plays a key role of integrating markets and increasing trade along with creating more than a million jobs. Railway enables the transportation for people and goods to even remote areas in the country. Also, as railway travel, typically, is cheaper than air travel for large distances, a large population of the country depends on railway for long distance travel.

**Budget for Ministry of Railways**



Source: Ministry of Finance, CRISIL MI&A

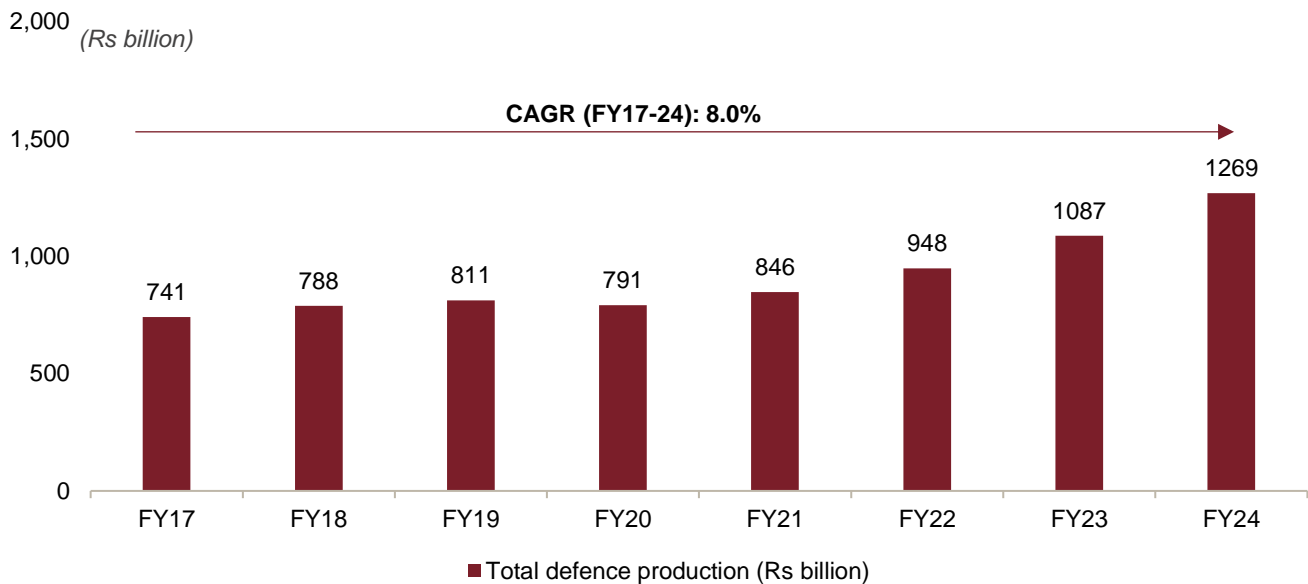
**Construction spends in Railways**

The central government announced a capital outlay of Rs 2.6 lakh crore for the Indian Railways in the Union Budget 2024 which is 8% higher than the preceding year's revised estimate of Rs 2.4 lakh crore. The additional funds have been allocated to support the essential infrastructure needed to develop industrial clusters at strategic locations. The railways have adopted a new approach for infrastructure development. Three Economic Railway Corridors- Energy, Mineral and Cement corridors (192 Projects); Port connectivity corridors (42 Projects) and High Traffic Density corridors (200 Projects) have been identified under the PM Gati Shakti Mission for enabling Multi-Modal connectivity. Capacity enhancement, decongestion of high density networks, achieving reduction in logistics cost in the country, enhancing Passenger experience and their Safety remains the priority areas for the government.

**6.9 Defense industry in India**

Over the past few years, indigenous defence production has been a key priority for the government. Various measures have been introduced to encourage the domestic defence industry. This includes, raising the FDI limit to 74% from 49%, DAP-2020 (which focuses on domestic procurement), PILs, simplification of industrial licensing, the iDEX scheme, SRIJAN portal, reforms in the offset policy, transfer of technologies, etc.

**Total defence production in India, FY17-24**



Note: E: estimated, P: projected

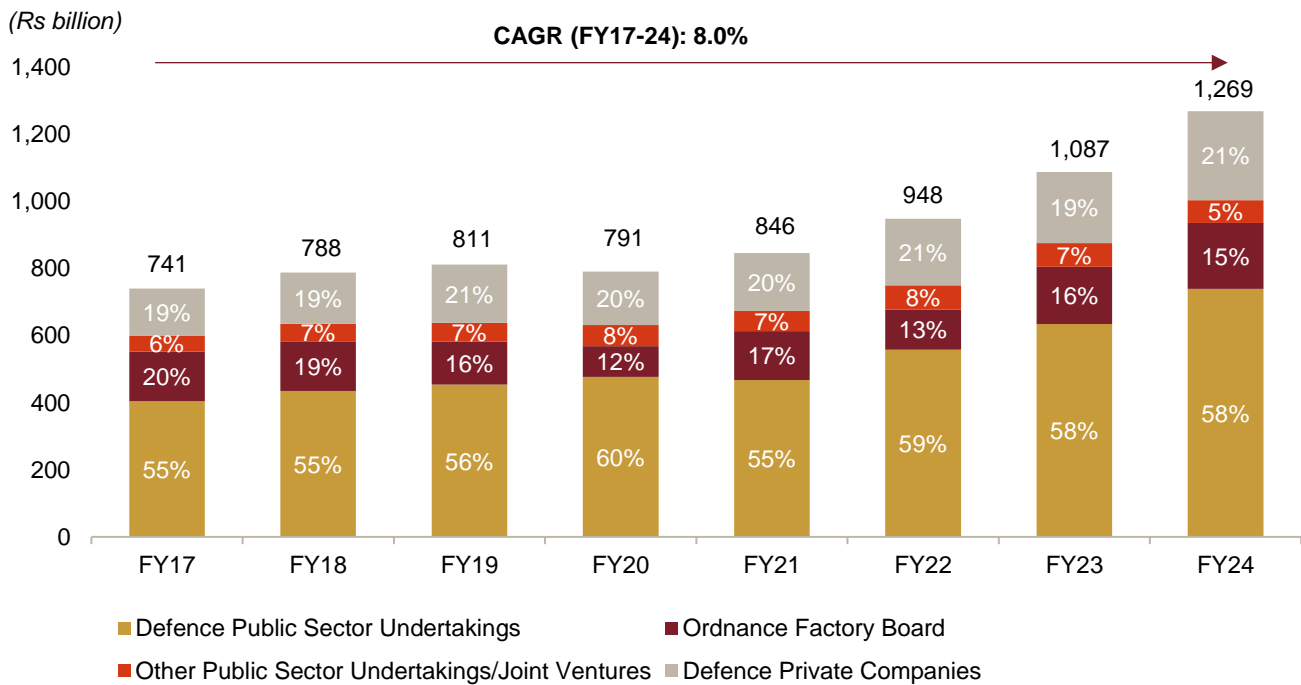
Source: MoD, CRISIL MI&A

Defence production in India totalled Rs 1,269 billion in fiscal 2024, up at a CAGR 8.0% over fiscals 2017-24. The growth was supported by policy reforms like raising the FDI limit to 74% from 49%, DAP-2020 (which focuses on domestic procurement), PILs, simplification of industrial licensing, the iDEX scheme, SRIJAN portal, reforms in the offset policy, transfer of technologies, strong impetus on the private sector's involvement, and infrastructure development (defence corridors in Uttar Pradesh and Tamil Nadu). The government has set a target of \$5 billion exports and corresponding \$22 billion defence production by 2025. The capital expenditure (capex) planned by the DPSUs will also boost domestic production.

**Private sector in defence production**

As of FY24, DPSUs held the largest share in the defence production at 58%, followed by private companies (21%), Ordnance Factory Board (OFB; 15%), and other PSUs/ JVs (5%).

**Segment-wise share of total defence production in India**



Source: MoD, CRISIL MI&A

Supported by policy support, the private sector has been growing at a slightly higher growth rate (9.4% over fiscals 2017-24) than DPSUs (9.0%). Over fiscals 2021-22, 85 new defence industrial licences were issued to the private sector. As of April 2023, the government has issued 606 industrial licences to 369 companies operating in the defence sector. Validity of the licences has been increased from 3 years to 15 years. PILs have opened new avenues of defence production for private companies and widened their scope to capture market share. In fiscal 2024, defence exports have reached an all-time high of \$ 2.63 billion.

## 7. Competitive landscape assessment

In this section, CRISIL MI&A has compared key players in the domestic heavy engineering, wear plates and welding consumable industries. Data has been sourced from publicly available information, including annual reports and investor presentations of listed players, regulatory filings, rating rationales, and/or company websites. The financials in the competitive section have been re-classified by CRISIL MI&A, based on annual reports and filings by the players.

### 7.1 Overview of key players

The welding equipment, wear plates and heavy engineering industries comprise both organized and unorganized players, some of key players in these industries are listed below.

Company name	Year established
ISGEC Heavy Engineering Ltd	1993
Esab India Ltd	1987
Ador Welding Ltd	1951
Ewac Alloys Ltd	1962
Diffusion Engineers Ltd	1982
AIA Engineering LTD	1978

Source: CRISIL MI&A, company website and annual reports, secondary research

### 7.2 Key financial parameters

#### 7.2.1 Operating income

Players	Revenue (operating income in Rs mn)				On-year growth (FY21-FY22)	On-year growth (FY22-FY23)	On-year growth (FY23-FY24)	CAGR growth %(FY21-FY24)
	FY21	FY22	FY23	FY24				
<b>ISGEC Heavy Engineering Ltd</b>	54,265	54,763	63,731	62,255	1%	16%	-2%	5%
<b>Esab India Ltd</b>	6,864	8,971	10,939	12,443	31%	22%	14%	22%
<b>Ador Welding Ltd</b>	4,493	6,627	7,789	8,869	47%	18%	14%	25%
<b>Ewac Alloys Ltd</b>	2,056	2,389	2,689	NA	16%	13%	NA	NA
<b>Diffusion Engineers Limited</b>	1,554	2,049	2,550	2,784	32%	24%	9%	21%
<b>AIA Engineering Ltd</b>	28,815	35,665	49,088	48,538	24%	38%	-1%	19%

Note: Diffusion data basis financials provided by client

NA: Not Available

Source: CRISIL MI&A, company website, company filings

Operating income – Revenue from operations which includes sales of products & services and other operating revenue

### 7.2.2 OPBDIT

Players	OPBDIT in Rs mn				On-year growth (FY21-FY22)	On-year growth (FY22-FY23)	On-year growth (FY23-FY24)	CAGR growth %(FY21-FY24)
	FY21	FY22	FY23	FY24				
ISGEC Heavy Engineering Ltd	5,015	3,191	4,855	5,042	-36%	52%	4%	0%
Esab India Ltd	891	1,229	1,898	2,306	38%	54%	22%	37%
Ador Welding Ltd	278	629	921	955	126%	46%	4%	51%
Ewac Alloys Ltd	252	346	282	NA	37%	-18%	NA	NA
Diffusion Engineers Limited	209	233	283	394	11%	21%	39%	24%
AIA Engineering Ltd	7,328	7,847	13,404	13,574	7%	71%	1%	23%

Note: Diffusion data basis financials provided by client  
NA: Not Available

Source: CRISIL MI&A, company website, company filings

### 7.2.3 OPBDIT margin

Players	OPBDIT (% of total income)			
	FY21	FY22	FY23	FY24
ISGEC Heavy Engineering Ltd	9%	6%	8%	8%
Esab India Ltd	13%	14%	17%	19%
Ador Welding Ltd	6%	9%	12%	11%
Ewac Alloys Ltd	12%	14%	10	NA
Diffusion Engineers Limited	14%	11%	11%	14%
AIA Engineering Ltd	25%	22%	27%	28%

Note: Diffusion data basis financials provided by client

Source: CRISIL MI&A, company website, company filings

### 7.2.4 EBITDA

Players	EBITDA (Rs mn)				On-year growth (FY21-FY22)	On-year growth (FY22-FY23)	CAGR growth % (FY21-FY24)	CAGR growth %(FY21-FY24)
	FY21	FY22	FY23	FY24				
ISGEC Heavy Engineering Ltd	5,116	3,254	4,963	5,241	-36%	52%	6%	1%
Esab India Ltd	939	1,256	1,945	2,342	34%	55%	20%	36%
Ador Welding Ltd	288	649	946	986	126%	46%	4%	51%
Ewac Alloys Ltd	270	352	310	NA	30%	-12%	NA	NA
Diffusion Engineers Ltd	202	268	348	476	33%	30%	37%	33%
AIA Engineering Ltd	8,184	8,655	14,652	15,659	6%	69%	7%	24%

Note: Diffusion data basis financials provided by client

N.M- Not Mentionable

Source: CRISIL MI&A, company website, company filings

EBITDA- Earnings before interest, tax, depreciation, and amortization

### 7.2.5 EBITDA margin %

Players	EBITDA margin (% of total income)			
	FY21	FY22	FY23	FY24
ISGEC Heavy Engineering Ltd	9%	6%	8%	8%
Esab India Ltd	14%	14%	18%	19%
Ador Welding Ltd	6%	10%	12%	11%
Ewac Alloys Ltd	13%	15%	11%	NA
Diffusion Engineers Ltd	13%	13%	14%	17%
AIA Engineering Ltd	28%	24%	30%	32%

Note: Diffusion data basis financials provided by client

Source: CRISIL MI&A, company website, company filings

### 7.2.6 Profit after tax

Players	Profit after tax (Rs mn)				On-year growth (FY21-FY22)	On-year growth (FY22-FY23)	On-year growth (FY23-FY24)	CAGR growth % (FY21-FY24)
	FY21	FY22	FY23	FY24				
ISGEC Heavy Engineering Ltd	2,530	1,150	2,055	2,549	-55%	79%	24%	0%
Esab India Ltd	593	843	1,357	1,630	42%	61%	20%	40%
Ador Welding Ltd	-104	452	593	632	-535%	31%	7%	-282%
Ewac Alloys Ltd	154	288	-71	NA	87%	-125%	NA	NA
Diffusion Engineers Ltd	117	170	221	308	45%	30%	39%	38%
AIA Engineering Ltd	5,657	6,196	10,565	11,370	10%	71%	8%	26%

Note: Diffusion data basis financials provided by client

Source: CRISIL MI&A, company website, company filings

### 7.2.7 Profit after tax %

Players	PAT (% of total income)			
	FY21	FY22	FY23	FY24
ISGEC Heavy Engineering Ltd	5%	2%	3%	4%
Esab India Ltd	9%	9%	12%	13%
Ador Welding Ltd	-2%	7%	8%	7%
Ewac Alloys Ltd	5%	5%	-3%	NA
Diffusion Engineers Ltd	8%	8%	9%	11%
AIA Engineering Ltd	19%	17%	22%	23%

Note: Diffusion data basis financials provided by client  
Source: CRISIL MI&A, company website, company filings

### 7.2.8 RoCE-%

Players	RoCE			
	FY21	FY22	FY23	FY24
ISGEC Heavy Engineering Ltd	14.5	7.8	11.1	12.2
Esab India Ltd	27.7	45.8	73.2	78.9
Ador Welding Ltd	-2.0	23.6	27.1	24.4
Ewac Alloys Ltd	20.0	38.9	-8.4	NA
Diffusion Engineers Ltd	14.6	16.9	18.0	20.2
AIA Engineering Ltd	17.7	17.1	25.1	22.6

Note: Diffusion data basis financials provided by client  
Source: CRISIL MI&A, company website, company filings

**ROCE (%) = Profit before interest/ (Average tangible net worth+ Total debt+ deferred tax liability).**

ROCE indicates the ability of a company's management to generate returns for both debt holders and equity holders. The higher the ratio, more efficiently is the capital being employed by the company to generate returns

### 7.2.9 Gearing ratio

Players	Gearing			
	FY21	FY22	FY23	FY24
ISGEC Heavy Engineering Ltd	0.5	0.6	0.5	0.3
Esab India Ltd	0	0	0	0
Ador Welding Ltd	0.1	0	0	0.1
Ewac Alloys Ltd	0.2	0	0	NA
Diffusion Engineers Ltd	0.2	0.2	0.3	0.2
AIA Engineering Ltd	0	0	0.1	0.1

Note: Diffusion data basis financials provided by client  
Source: CRISIL MI&A, company website, company filings

**Gearing (times) = total debt/ Net worth**

Gearing compares a company's total debt to shareholders equity

### 7.2.10 RoE (%)

Players	RoE			
	FY21	FY22	FY23	FY24
ISGEC Heavy Engineering Ltd	13	5.5	9.2	10.4
Esab India Ltd	19.9	33.6	54.1	58.0
Ador Welding Ltd	-4.1	17.4	19.6	18.5
Ewac Alloys Ltd	15.2	29.4	-7.7	NA
Diffusion Engineers Ltd	11.7	15.1	17.0	18.5



AIA Engineering Ltd	14.3	13.8	20.3	18.5
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Note: Diffusion data basis financials provided by client  
Source: CRISIL MI&A, company website, company filings

**ROE (%) = PAT/ Average tangible net worth**

**ROE measures the profitability of equity funds invested in the Company**

### 7.2.11 Working capital ratio

Players	Working capital ratio			
	FY21	FY22	FY23	FY24
ISGEC Heavy Engineering Ltd	1.5	1.5	1.6	1.4
Esab India Ltd	1.7	1.5	1.7	1.7
Ador Welding Ltd	1.9	1.9	2.6	2.8
Ewac Alloys Ltd	1.3	1.5	1.5	NA
Diffusion Engineers Ltd	3	2.7	3.9	3.4
AIA Engineering Ltd	11.5	9.4	8.5	10.3

Note: Diffusion data basis financials provided by client  
Source: CRISIL MI&A, company website, company filings

Working capital ratio – current assets/current liabilities

#### Key Observations.

- Among the players considered, Diffusion Engineers Ltd had the third highest CAGR of 21% for operating income between FY21-24, behind Ador welding Ltd with 25% CAGR and Esab India Ltd with 22% CAGR for FY21-24.
- For profit after tax, Diffusion Engineers Ltd had the second highest CAGR of 38%, among the players considered, between fiscal 2021-24, behind Esab India Ltd with 40% CAGR.
- Among the players considered, Diffusion Engineers Ltd had the third highest CAGR growth of 33% for EBITDA between fiscal 2021-24 .

### 7.2.12 Exports

Company name	Exports
	FY24 (Rs Mn)
ISGEC Heavy Engineering Ltd	8,119
Esab India Ltd	1,250
Ador Welding Ltd	1,215
Ewac Alloys Ltd	NA
Diffusion Engineers Ltd	263.5
AIA Engineering LTD	27,694

NA: Not available

Source: CRISIL MI&A, company website and annual reports, secondary research

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CRISIL Limited (**CRISIL**) is a leading, agile and innovative global analytics company driven by its mission of making markets function better. CRISIL, along with its subsidiaries, is India's foremost provider of ratings, data, research, analytics and solutions with a strong track record of growth, culture of innovation, and global footprint. It is majority owned by S&P Global Inc, a leading provider of transparent and independent ratings, benchmarks, analytics and data to the capital and commodity markets worldwide. It has delivered independent opinions, actionable insights, and efficient solutions to over 100,000 customers through businesses that operate from India and globally.

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