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Industry Report on Mechanical, Electrical and Plumbing (MEP) Services in India

September 2023

Disclaimer

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Global Macroeconomic Scenario

The global economy is now showing signs of moderate recovery as it posted a growth of 3.3% in CY 2022. But GDP growth will remain at a moderate level of 2.7% in CY 2023 and forecasted to improve to 2.9% in CY 2024. Global banks were carrying a historically high debt burden after COVID. Central banks took tight monetary measures to control inflation and spike in commodity prices. Russia's war with Ukraine further affected the global supply chains and inflated the prices of energy and other food items. These factors coupled with war-related economic sanctions impacted the economic activities in Europe. Any further escalation in the war may further affect the rebound of the economy in Europe.

While China was facing a crisis in the real estate sector and prices of properties were declining, with the reopening of the economy, consumer demand is picking up again. The Chinese authorities have taken a variety of measures, including additional monetary easing, tax relief for corporates, and new vaccination targets for the elderly. The government has also taken steps to help the real estate sector including cracking down on debt-ridden developers, announcing stimulus for the sector and measures to encourage the completion and delivery of unfinished real estate projects. The sector is now witnessing investments from developers and demand from buyers.

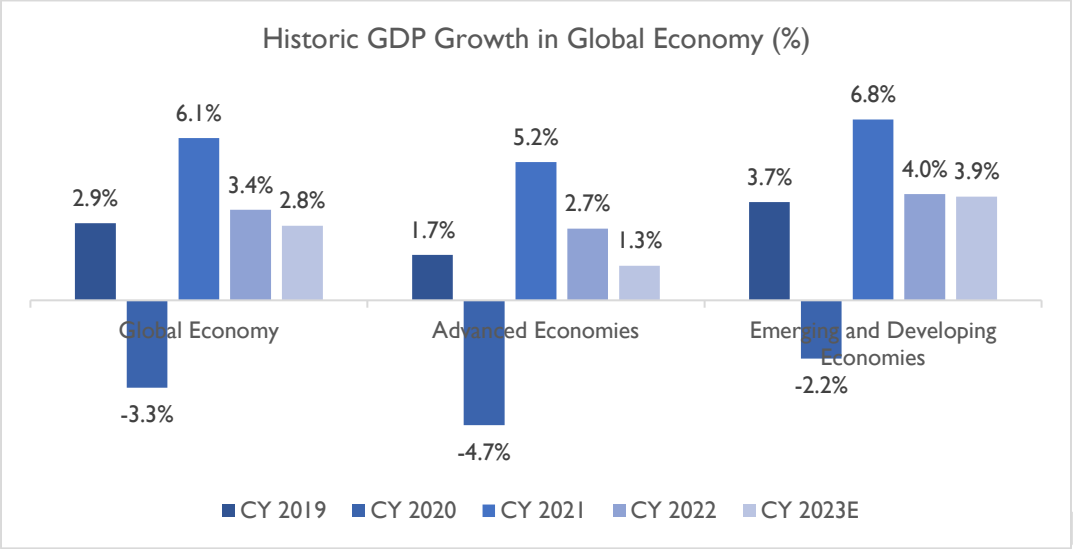
Global headline inflation is set to fall from 8.7 % in CY 2022 to 7.0 % in CY 2023, primarily on the back of softening commodity prices. Most of the central banks in the world has been increasing interest rates since CY 2021 to control inflation, and this is having an impact. With the sharp rise in policy rates, vulnerabilities in the banking sector have come into focus. Fears of contagion have risen across the broader financial sector, including non-banking financial institutions with regulators taking action to stabilize the banking system.

Global GDP Growth Scenario

The global economy started to rise from its lowest levels after countries started to lift the lockdown. The pandemic lockdown was a key factor as it affected economic activities resulting in a recession in the year CY 2020, as the GDP growth touched -3.3%.

In CY 2021 disruption in the supply chain affected most of the advanced economies as well as low-income developing economies. The rapid spread of Delta and the threat of new variants in mid of CY 2021 further increased uncertainty in the global economic environment.

Global economic activities experienced a sharper-than-expected slowdown in CY 2022. One of the highest inflations in decades forced most of the central banks to tighten their fiscal policies. Russia’s invasion of Ukraine affected the global food supply resulting in a further increment in the cost of living. As a result, global growth declined from 6.1% in CY 2021 to 3.4% in CY 2022.

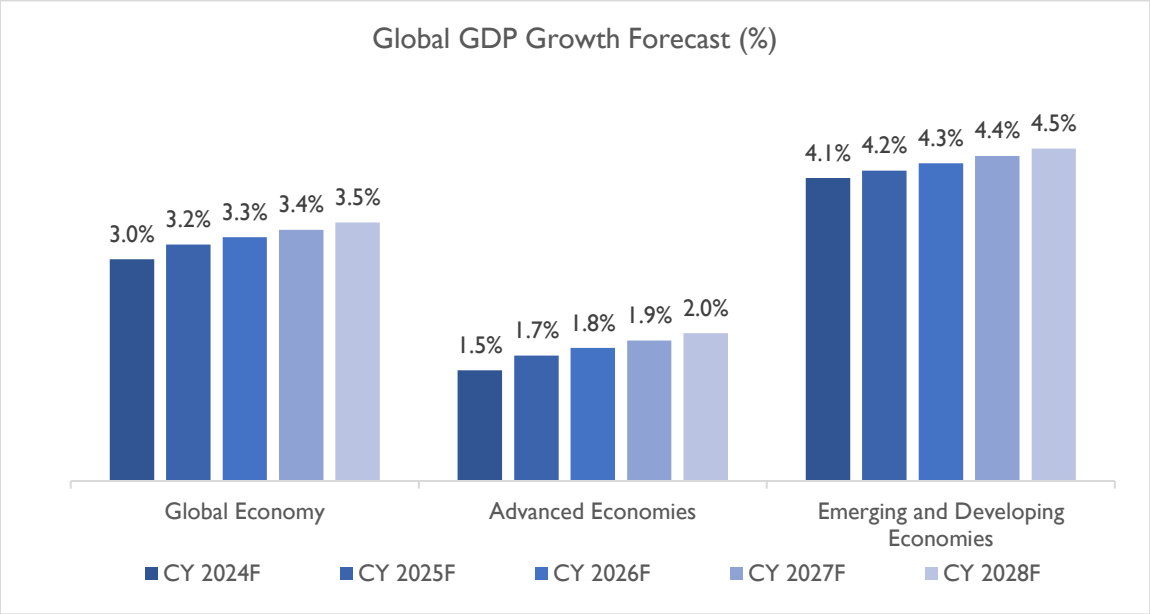


Source – IMF Global GDP Forecast Release 2023

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

In the current scenario, global GDP growth is forecasted to record a moderate growth of 2.8% in CY 2023 as compared to 3.4 % growth in CY 2022. While high inflation and rising borrowing costs are affecting private consumption, on the other hand, fiscal consolidation is affecting government consumption.

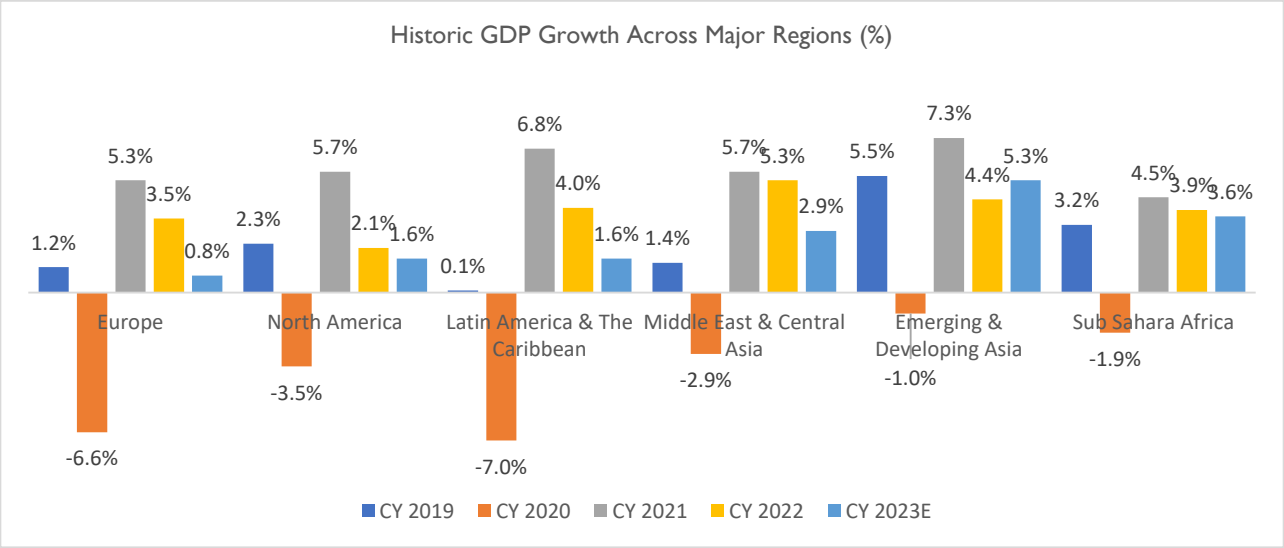
Flat growth in developed economies will affect the GDP growth in CY 2024 and global GDP is expected to record marginal growth of 3.0% in CY 2024. The current crisis in the housing sector, bank lending, and industrial sectors are affecting the growth of global GDP. Inflation forced central banks to adopt tight monetary policies. After touching the peak, inflationary pressures are slowly easing out. This environment weighs against interest rate cuts by many monetary authorities. The expectation is therefore still for slowing growth in the second half of CY 2023 and the first half of CY 2024.



Source – IMF Global GDP Forecast Release 2023, D&B Estimates

GDP Growth Across Major Regions

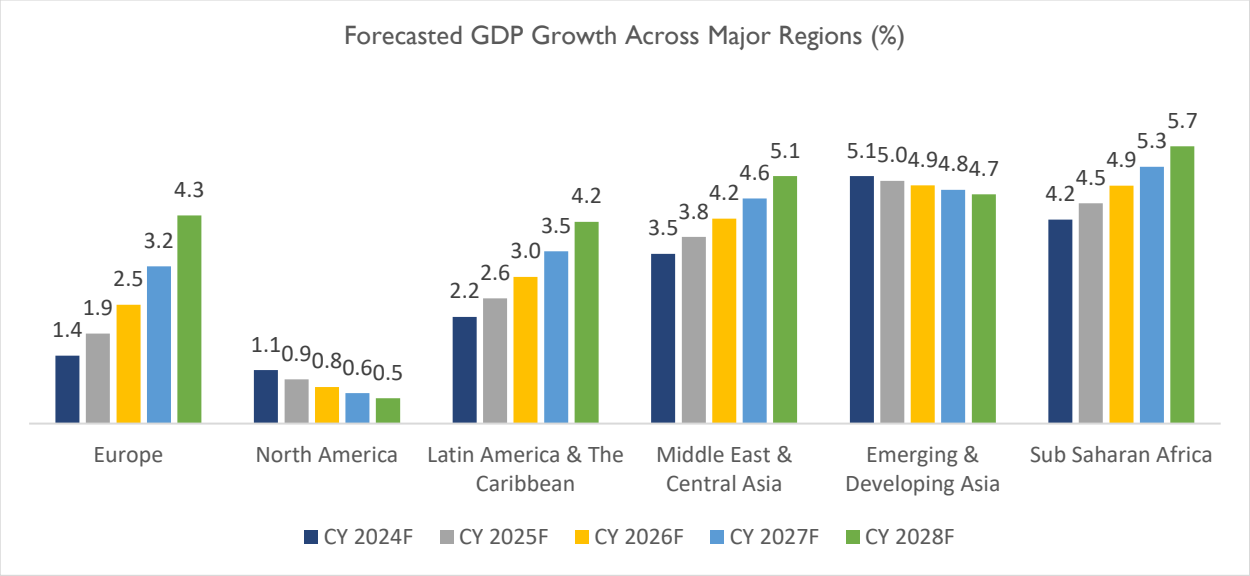
GDP growth of major regions including the United States, Latin America, Europe, Middle East & Central Asia, and Sub-Saharan Africa, are showing signs of slow growth and recession. Meanwhile, GDP growth in Emerging and Developing Asia (India, China, Indonesia, Malaysia etc.) is expected to increase from 4.4% in CY 2022 to 5.3% in CY 2023.



Source-IMF World Economic Outlook 2023

Except for Emerging and Developing Asia, all other regions are expected to record a decline in GDP growth rate in CY 2023 as compared to CY 2022. GDP growth in the United States is expected at 1.6% in CY 2023. Tight monetary and financial conditions coupled with high inflations are the major factors in this subdued growth.

Higher energy prices are curbing consumer demand in Europe's largest economies. Surging inflation and a decline in government spending are further affecting on an overall basis as Europe is expected to record GDP growth of 0.8% in CY 2023 as compared to 3.5% growth in CY 2022. China is expected to see strong increase in its GDP growth after the government has lifted the restrictions of its zero-COVID policy. China is expected to record a 5.4% growth in its GDP in CY 2023. Asian economies are expected to drive most of the global growth in CY 2023, as they will benefit from the ongoing reopening dynamics and less intense inflationary pressures compared to other regions.



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

India Macroeconomic Analysis

GDP Growth Scenario

India's economy is showing signs of resilience with GDP growing by 7.2% in FY 2023. Although this translates into a moderation in demand (compared to FY 2022), the GDP growth in FY 2023 represents a return to pre pandemic era growth path. Despite this moderation in growth, India continues to remain one of the fastest growing economies in the world.

Country	GDP Growth (2022)
India	**7.2%**
United Kingdom	4.1%
Italy	3.7%
Canada	3.4%
China	3.0%
Brazil	2.9%
France	2.6%
United States	2.1%
South Africa	2.0%
Germany	1.8%
Japan	1.0%
Russia	-2.1%

Source: World Bank
GDP growth for India refers to FY 2023 as per MOSPI
Countries considered include - Largest Developed Economies and BRICS (Brazil, Russia, India, China, and South)
Countries have been arranged in descending order of GDP growth

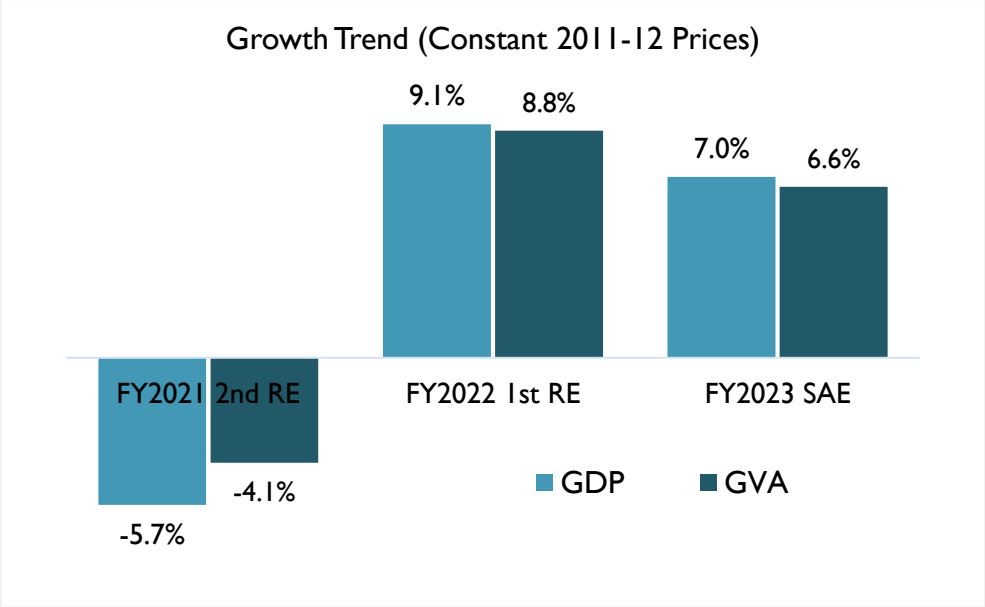
There are quite a few factors aiding India's economic recovery – notably its resilience to external shocks (ongoing Russia – Ukraine conflict) and rebound in private consumption. This rebound in private consumption is bringing back the focus on improvements in domestic demand, which together with revival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

Realizing the need to impart external stimuli, the Government stepped up its spending on infrastructure projects which in turn had a positive impact on economic growth. The capital expenditure of central government increased by nearly 24.5% during FY 2023 as compared to the previous fiscal. The improvement was accentuated further as the Union Budget 2023-2024 announced 37.4% increase in capital expenditure (budget estimates), to the tune of Rs 10 trillion. The announcement also included 30% increase in financial

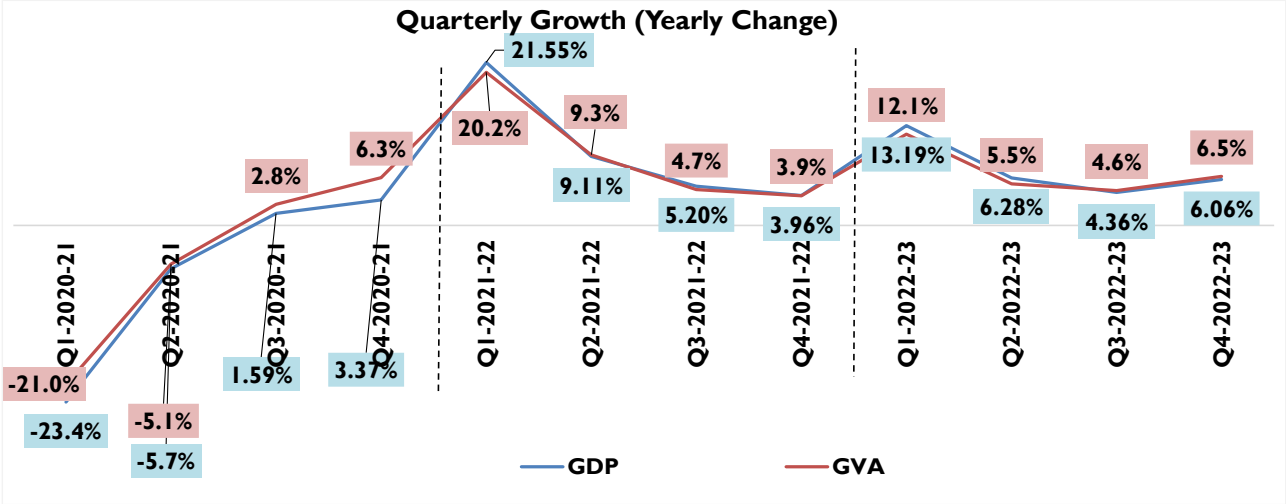
assistance to states at Rs 1.3 trillion for capex. This has provided the much-needed confidence to private sector, and in turn attracted private investment.

On the lending side, the financial health of major banks has witnessed an improvement which has helped in improving the credit supply. With capacity utilization improving, there would be demand for credit from corporate sector to fund the next round of expansion plans. Banking industry is well poised to address that demand. Underlining the improving credit scenario is the credit growth to micro, small and medium enterprise (MSME) sector as the credit outstanding to the MSME sector by scheduled commercial banks in the financial year FY 2023 grew by 12.3% to Rs 22.6 trillion compared to FY 2022. The extended Emergency Credit Linked Guarantee Scheme (ECLGS) by the Union Government has played a major role in improving this credit supply.

India's GDP in FY 2023 grew by 7.2% compared to 9.1% in the previous fiscal on the back of slowing domestic as well as external demand owing to series of interest rate hikes globally to tackle high inflation. The year-on-year moderation in growth rate is also partly due to a fading impact of pandemic-induced base effects which had contributed towards higher growth in FY 2022. On quarterly basis, the country growth moderated in Q2 and Q3 of FY 2023 which highlights impact of slowing economy on the back of monetary tightening. During Q3 FY 2023, the country's GDP grew by 4.36% against 6.28% y-o-y increase in the corresponding quarter last fiscal. However, the fourth quarter of FY 2023 saw a rebound in growth rate, indicating an optimistic scenario.



Source: Ministry of Statistics & Programme Implementation (MOSPI)
RE stands for Revised Estimates, SAE stands for Second Advance Estimates



Source: Ministry of Statistics & Programme Implementation (MOSPI)

Sectoral Growth Trend: Annual

Sectoral analysis of GVA reveals growth tapered sharply in industrial sector which is estimated to have grown by just 3.6% in FY 2023 against 11.6% in FY 2022. In the industrial sector, growth across major economic activity such as mining, manufacturing, construction sector slowed registering a growth of 3.4%, 0.6% and 9.1% in FY 2023 against a growth rate of 7.1%, 11.05% and 14.8% recorded in FY 2022, respectively. Utilities sector too observed a marginal moderation in y-o-y growth to 9.2% against a decline of 3.6% in the previous years.

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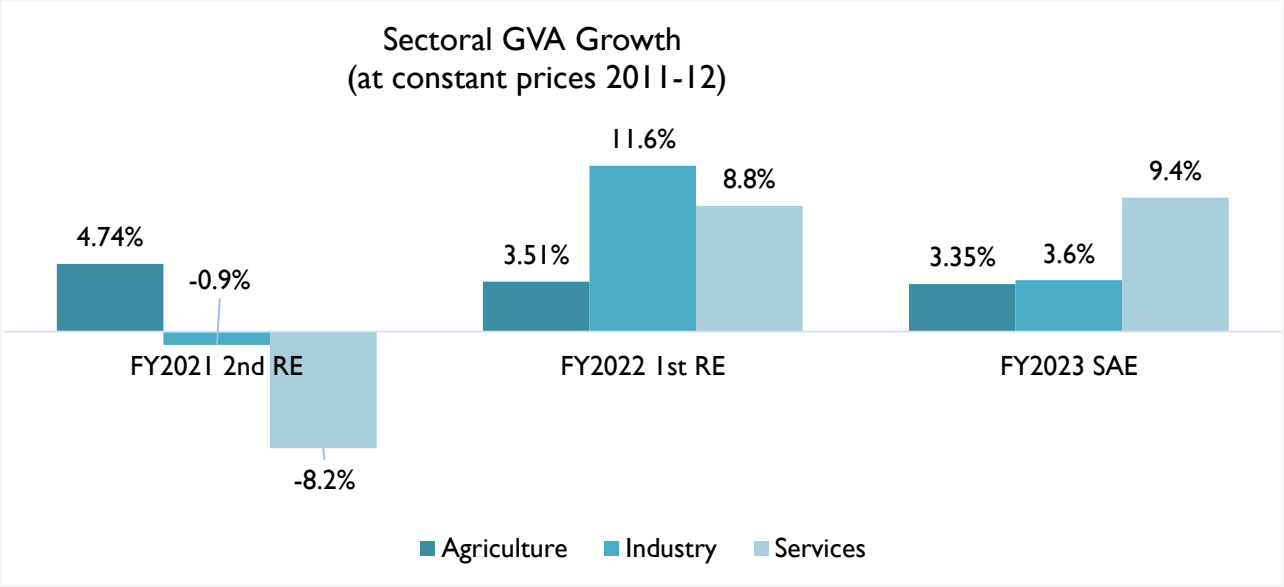
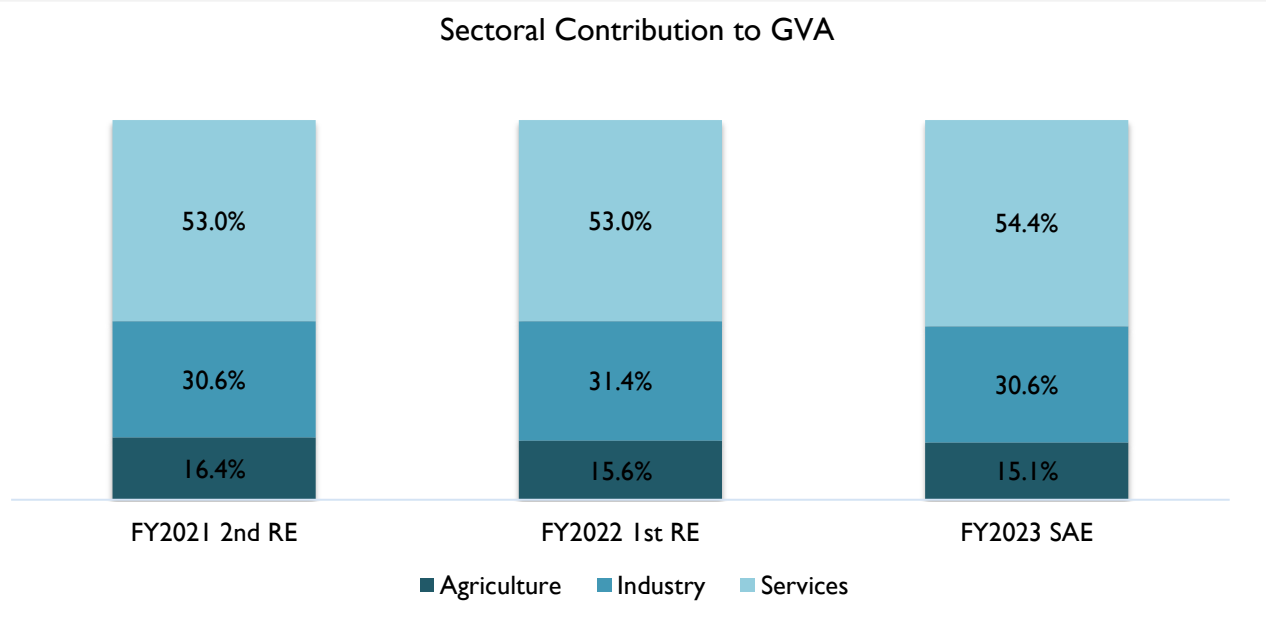


Source: Ministry of Statistics & Programme Implementation (MOSPI)

Talking about the services sectors performance, with major relaxation in covid restriction, progress on covid vaccination and living with virus attitude, business in service sector gradually returned to normalcy in FY 2022. Economic recovery was supported by the service sector as individual mobility returned to pre-pandemic level. The trade, hotel, transport, communication, and broadcasting segment continued to

strengthen and grow by 14.18% in FY 2023 against 13.75% in the previous year and financial services, real estate and professional services sector recorded 6.85% y-o-y growth against 4.73%. However, overall service sector growth was curbed by moderation in public administration and defence services sector which recorded 7.12% yearly increase against 9.7% increase in the previous year.



Source: Ministry of Statistics & Programme Implementation (MOSPI)

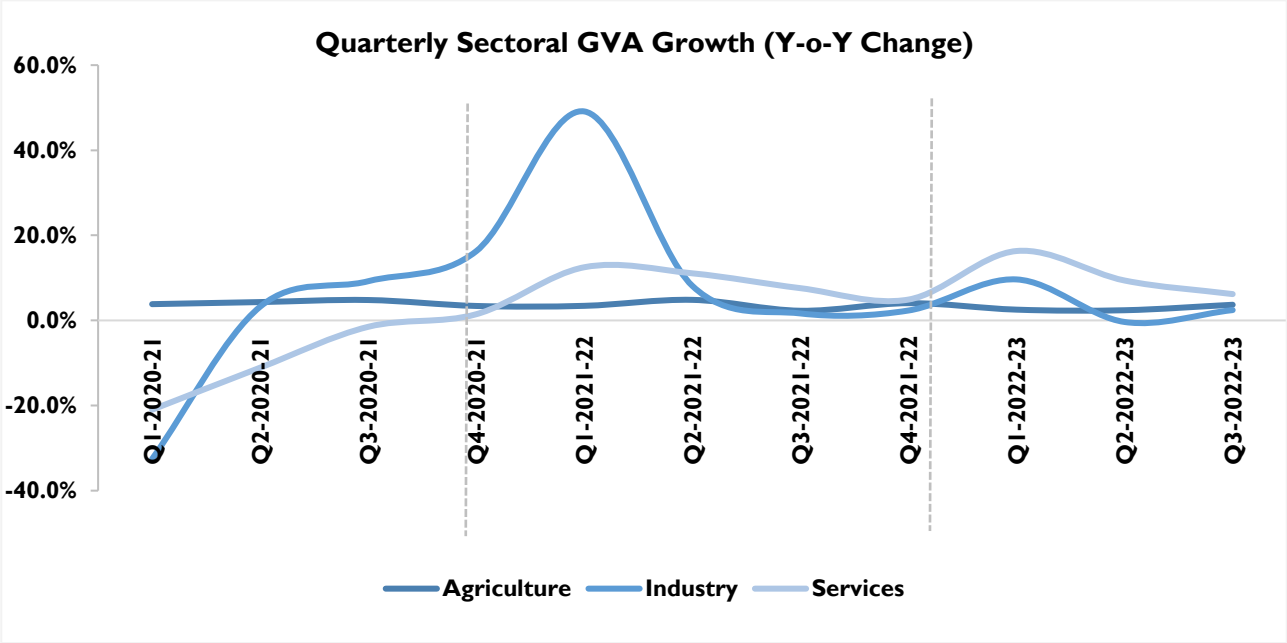
Sectoral Growth Trend: Quarterly

Quarterly GVA number indicated sustained weakness in economic activity during Q3 FY 2023 with manufacturing activity being the worst hit segment amongst the industrial sectors. India's manufacturing sector shrank by 1.1% on-year in Q3 FY 2023, a second straight contraction highlighting the continuing weakness in consumer demand and exports. In Q2 FY 2023, manufacturing sector output was down by 3.57%. While quarterly growth in both agriculture and other sectors within industrial sector strengthened during Q3 FY 2023.

Agriculture sector GVA strengthen in Q3 FY 2023 to register 3.68% yearly growth compared to both corresponding quarter last year (2.28%) and previous quarter (2.4%) in FY 2022. Any growth between 3.5-4% in farm sector is considered above the long-term trend line. Construction sector witnessed 8.39% y-o-y growth in Q3 of FY 2023 against 5.85% y-o-y growth in the previous quarter, mining and quarrying sector, and Electricity, gas, water supply& other utility services sector registered 3.7% and 8.24% y-o-y growth against -0.4% and 5.96%, respectively.

In Q3 FY 2023, yearly growth stood as 0.23%, 5.42% and 5.99% in construction, mining and quarrying and Electricity, gas, water supply& other utility services sector, respectively. Within service sector, quarterly growth moderated across all segments in Q3 FY 2023 against the previous quarter. Trade, hotel, transport, communication, and broadcasting segment observed 9.56% y-o-y growth in Q3 as compared to 15.64% growth in the last quarter. Other services sector broadly classified under Public Admin, Defence & Other

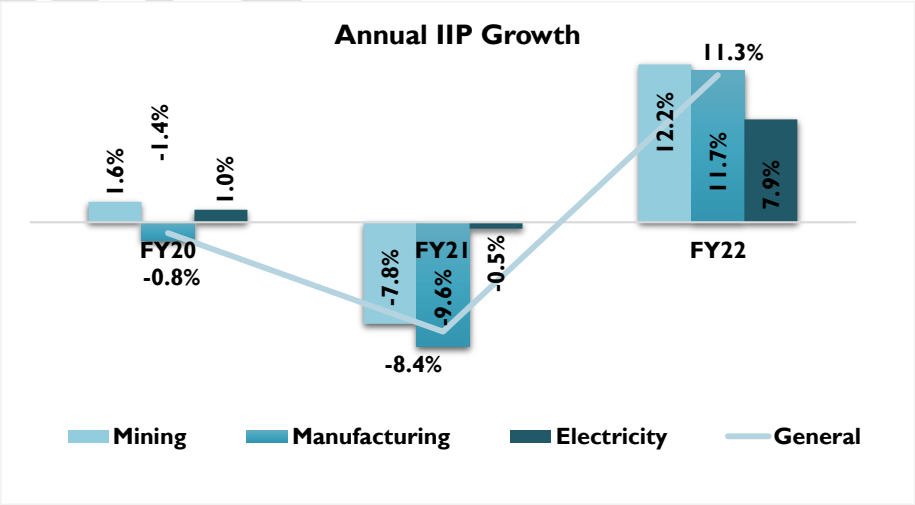
Services and Financial, Real Estate & Professional Services too observed 1.99% and 5.79% growth in Q3 FY 2023 against 5.57% and 7.13% y-o-y change in Q2 FY 2023.



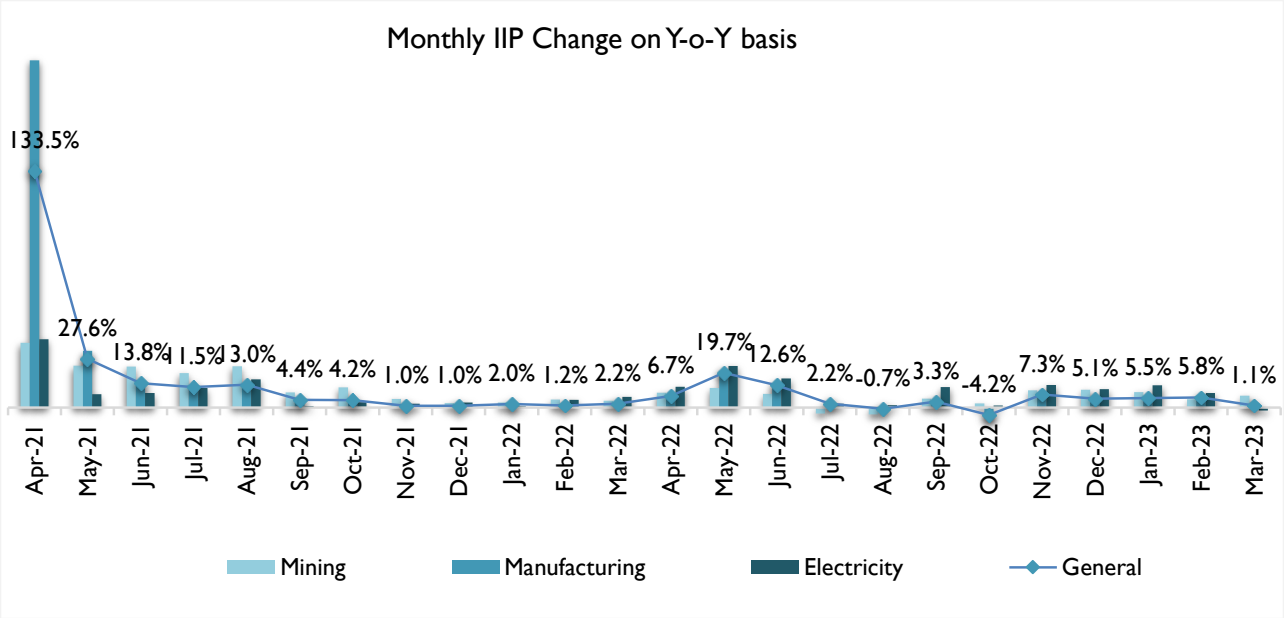
Source: Ministry of Statistics & Programme Implementation (MOSPI)

Index of Industrial Production

After experiencing three years of deteriorating industry growth, the country's Index of Industrial Production (IIP) index registered 11.3% y-o-y growth where growth was evenly spread across all sub-segments. Manufacturing index, with 77.6% weightage in overall index, registered 11.7% y-o-y growth in FY 2022 while mining sector index registered the highest growth. Classified based on usage i.e., infrastructure/construction goods, capital good, intermediate good and consumer durable outperformed over the other sector and registered healthy double-digit growth.



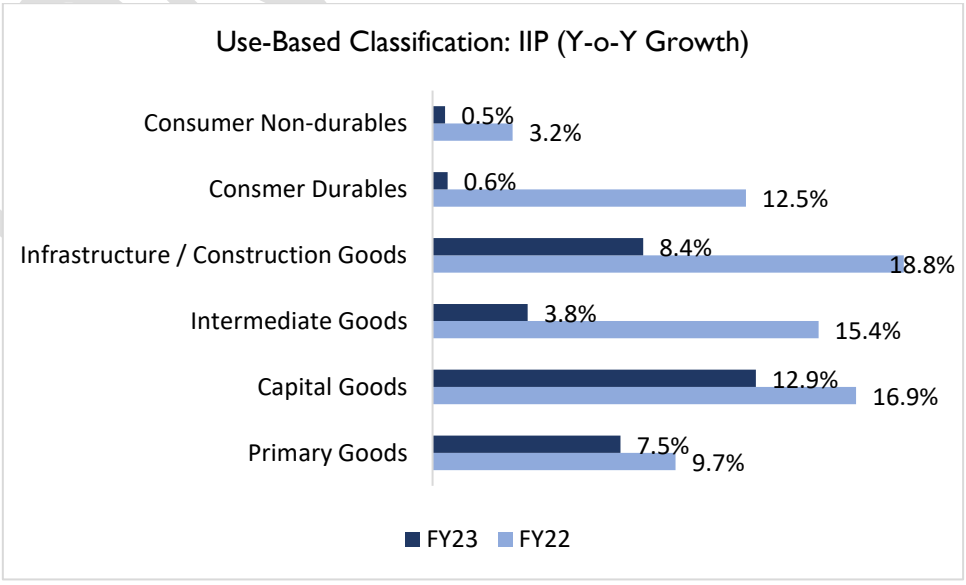
Source: Ministry of Statistics & Programme Implementation (MOSPI)



Source: Ministry of Statistics & Programme Implementation (MOSPI)

In FY22, IIP index improved steadily between March to May but moderated sharply in the subsequent three month and it measured lowest in October 2022 while it showed temporary improvement by growing at 7.3% in subsequent. However, IIP again moderated to register 5.1 % y-o-y growth in December 2022. Manufacturing activity which has 77.6% weightage in the overall index, grew by 2.6% in December 2022 while mining activity and electricity index grew by 9.8% and 10.4%, respectively.

On y-o-y basis, monthly IIP growth in December 2022 was relatively higher compared to previous year due to low base effect where overall IIP was adversely affected by onset of third wave of pandemic. Low base affect and year end festive sale are likely to support IIP growth in the coming month. However, moderation in external demand and consequent decline in trade have potential to affect manufacturing sector output and putting downward pressure on overall IIP growth.

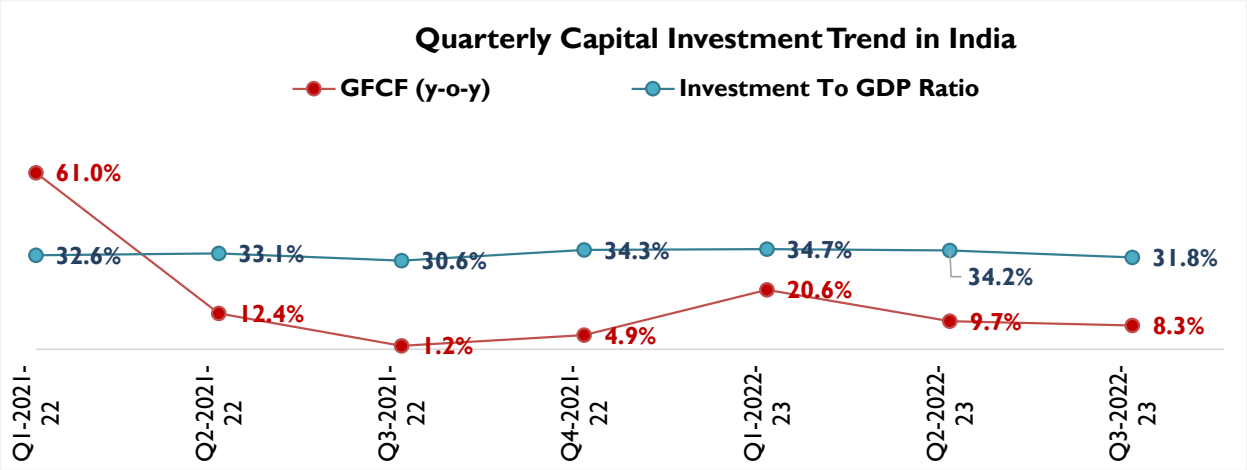


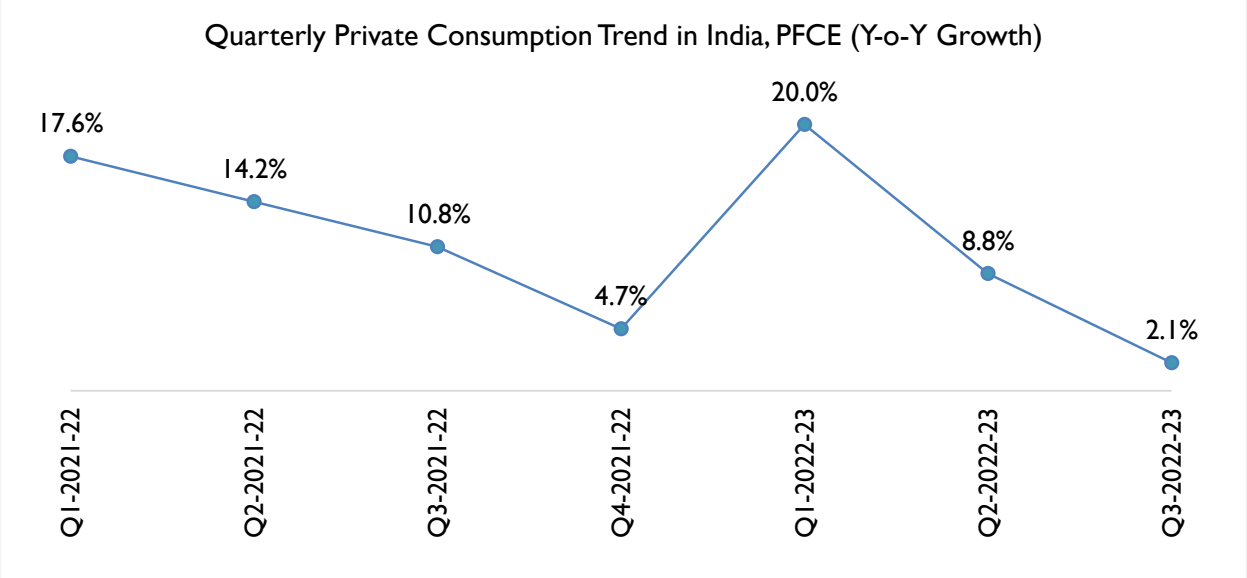
Sources: MOSPI

As per the use-based classification, growth in all segments deteriorated for FY 2023 as compared to FY 2022. Consumer good and intermediate goods were worst hit segments followed by infrastructure / construction Goods. The contracting IIP data points towards adverse operating business climate as global headwinds, high inflation, and monetary tightening started having adverse impact on manufacturing activity in FY 2023.

Investment & Consumption Scenario

Other major indicators such as Gross fixed capital formation (GFCF), a measure of investments, moderated during Q2 FY 2023 and Q3 FY 2023 while 8% y-o-y growth number was encouraging against 1.2% yearly growth in Q3 FY 2022. Despite the festive season demand and largely a covid-free economy, Private Final Consumption Expenditure (PFCE) a realistic proxy to gauge household spending, observed a continued moderation in Q3 FY 2023 where yearly growth softened to 2.1% which was nearly 7% lower compared to Q2 FY 2023.



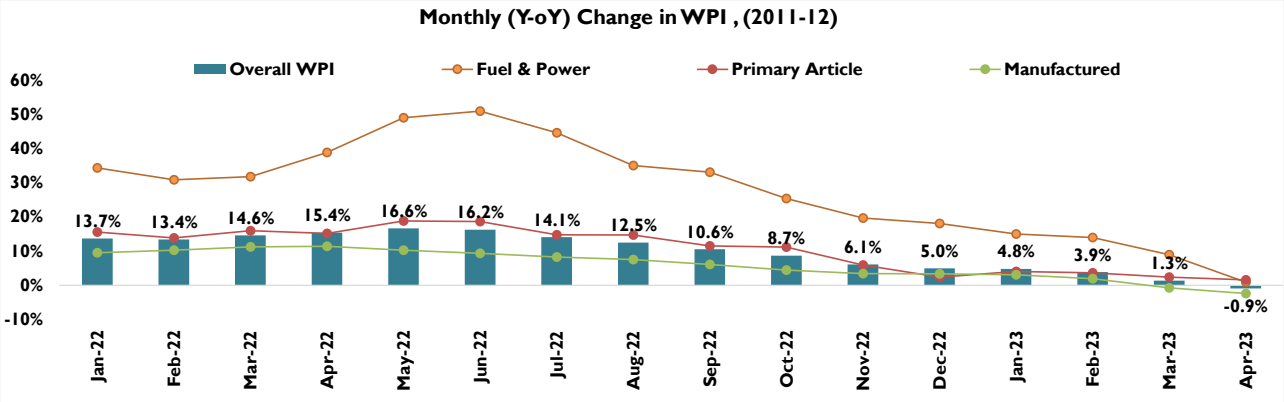


Sources: MOSPI

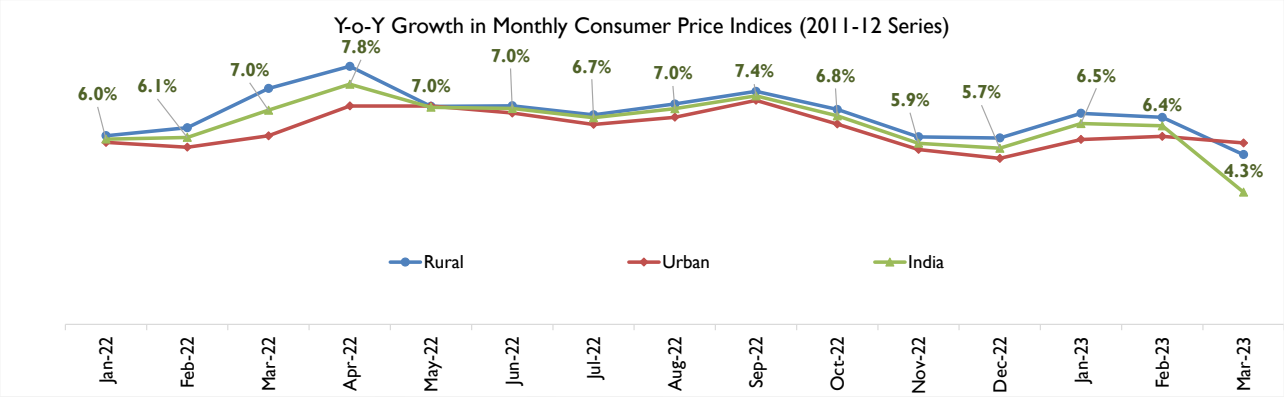
Inflation Scenario

Wholesale Price Index (WPI) is moderating on the back of softening of prices. Compared to April 22, WPI in April 2023 dropped by -0.9%. This is primary on the back of softening of fuel & power prices. Monthly y-

o-y change (April 2023 v/s April 2022) for manufactured products was -2.9%, and this too contributed to the moderation in WPI. Softening prices of mineral oils, chemicals & chemical products, textiles, crude petroleum & natural gas, textiles, and food products. contributed towards moderation in WPI inflation.



Source: MOSPI, Office of Economic Advisor



Source: CMIE Economic Outlook

Retail inflation rate (as measured by Consumer Price Index) again jumped above 6% tolerance limit of the central bank in January 2023 after observing mild moderation in the previous two month. The overall CPI grew by 6.5% in January 2023 due to spike in food inflation and CPI food index grew by 5.9% during FY 2023 against 4.2% y-o-y growth in the previous year. Within food index, Cereals and product-led food inflation reached 16.1 per cent in January 2023 from 13.8 per cent in December 2022. As a part of anti-inflationary measure, the RBI has hiked the repo rate by 225 bps since May 2022 to current 6.5% (May 2023), with latest fourth round hike announced on 8 Feb 2023. The Reserve Bank of India has estimated an average inflation rate of 6.5% for FY 2023. Since then, retail inflation appears to be softening, as it grew by 6.4% and 4.3% respectively in February and March of 2023.

Growth Outlook

Amidst the difficult and uncertain external economic environment, the Indian government has delivered a balanced Union Budget which focuses on achieving an inclusive and sustainable growth while adhering to the fiscal glide path. Notwithstanding the external risk, there is a sustained momentum in economic activity supported by domestic drivers. The consumer confidence survey by the Reserve bank of India points towards

rising confidence of households both for the current situation as well as the future expectations (for a one-year period).

Rural demand is likely to be boosted by good prospects for agricultural output and discretionary spending is expected to support urban consumption supporting. Resilient domestic financial markets, sturdy growth in credit and the government's thrust on capital expenditure is expected to drive momentum in investment activity. Capacity utilization in the manufacturing sector has surpassed its long period average. Thus, the stance taken by the government to not only emphasize on the top-down approach to growth i.e focusing on substantial capital outlay, but also to place focus on the bottom of the pyramid by trying to unleash the potential of the primary sector in the Union Budget should support India's growth momentum in 2023.

Some of the key factors that would propel India's economic growth in the coming years

Government focus on infrastructure development

Infrastructure development has remained recurring theme in India's economic development. As India aims to grow to a USD 5 trillion economy by 2027, Construction sector that include Infrastructure construction will be critical for boosting economic growth as it is the key growth enabler for several other sector. Infrastructure development provides impetus to other sectors like cement, bitumen, iron and steel, chemicals, bricks, paints, tiles, financial services among others. A unit increase in expenditure in construction sector has a multiplier effect on other sectors with a capacity to generate income as high as five times in other sectors. The sector enjoys intense focus from the Government which is well reflection in higher budgetary allocations. To push the infrastructure development, government has also announced higher budgetary allocation, various arrangement for raising funds through road asset monetization plan and converting of NHAI's existing InvIT into a public one is also planned. With economic targeting to reach USD 5 trillion economy by 2027, demand for various infrastructure facilities such as power, cargo movement, passenger movement is likely to grow which necessitate steady capacity addition in infrastructure facilities. Speedy progress and time-bound completion of infrastructure project would key factor to watch that will determine the sector performance.

The launch of flagship policies like National Infrastructure Pipeline (NIP), and PM Gati Shakti plan have provided the coordination & collaboration that was lacking earlier. Both NIP and PM Gati Shakti are ambitious billion-dollar plans that aim to transform India's infrastructure, elevating it to the next level. These projects are expected to improve freight movement, debottleneck the logistics sector, and improve the industrial production landscape, which would provide the incremental growth in GDP. In its Union Budget FY 2023, the Government has increased the capital expenditure by 35% to nearly INR 7.5 lakh crore – which indicates the strong Government focus on improving the overall infrastructure landscape in India.

Development of Domestic Manufacturing Capability

The Government launched Production Linked Incentive (PLI) scheme in early 2020, initially aimed at improving domestic manufacturing capability in large scale electronic manufacturing and gradually extended to other sectors. At present it covers 14 sectors, ranging from medical devices to solar PV modules. The PLI scheme provides incentives to companies on incremental sales of products manufactured in India. This

incentive structure is aimed to attracting private investment into setting up manufacturing units and thereby beef up the domestic production capabilities. The overall incentives earmarked for PLI scheme is estimated to be INR 2 lakh crore. If fully realizing the PLI scheme would have the ability to add nearly 4% to annual GDP growth, by way of incremental revenue generated from the newly formed manufacturing units.

Strong Domestic Demand

Domestic demand has traditionally been one of the strong drivers of Indian economy. After a brief lull caused by Covid-19 pandemic, the domestic demand is recovering. Consumer confidence surveys by Reserve Bank / other institutions are points to an improvement in consumer confidence index, which is a precursor of improving demand. India has a strong middle-class segment which has been the major driver of domestic demand. Factors like fast paced urbanization and improving income scenario in rural markets are expected to accelerate domestic demand further. This revival is perfectly captured by the private final consumption expenditure (PFCE) metric. PFCE as a percentage of GDP increased to nearly 59.2 during the first half of FY 2023[1], which is the highest level it has achieved during the past few years. Although pent-up demand has played a part in this surge, this is an indication of normalization of demand.

There are two factors that are driving this domestic demand: One the large pool of consumers and second the improvement in purchasing power.

- The share of middle class increased from nearly 14% in 2005 to nearly 30% in 2021 and is expected to cross 60% by 2047 (Placeholder1)[2]. This expanding middle class household segment is fuelling India's growth story and would continue to play a key role in propelling India's economic growth.
- As per National Statistics Office (NSO) India's per capita income (in current prices) stood at INR 1.72 lakhs in FY 2023 which is nearly double of what it was in FY 2015. This increase in per capita income has impacted the purchasing pattern as well as disposable spending pattern in the country. Consumer driven domestic demand is majorly fuelled by this growth in per capita income.

Digitization Reforms

Ongoing digitization reforms and the resultant efficiency gains accrued would be a key economic growth driver in India in the medium to long term. Development of digital platforms has helped in the seamless roll out of initiatives like UPI, Aadhaar based benefit transfer programs, and streamlining of GST collections. All of these have contributed to improving the economic output in the country. Some of the key factors that have supported the digitization reforms include – the growth in internet penetration in India together with drop in data tariffs, growth in smartphone penetration, favourable demographic pattern (with higher percentage of tech savy youth population) and India's strong IT sector which was leveraged to put in place

[1] India Economic Survey FY 2023, Full year data is yet to be released.
[2] As per the survey conducted by People Research on India's Consumer Economy. Households with annual income in the range of INR 5 – 30 lakh is considered as middle class households.

the digital ecosystem. All these factors are expected to remain supportive and continue to propel the digitization reforms in India.

Construction Industry in India

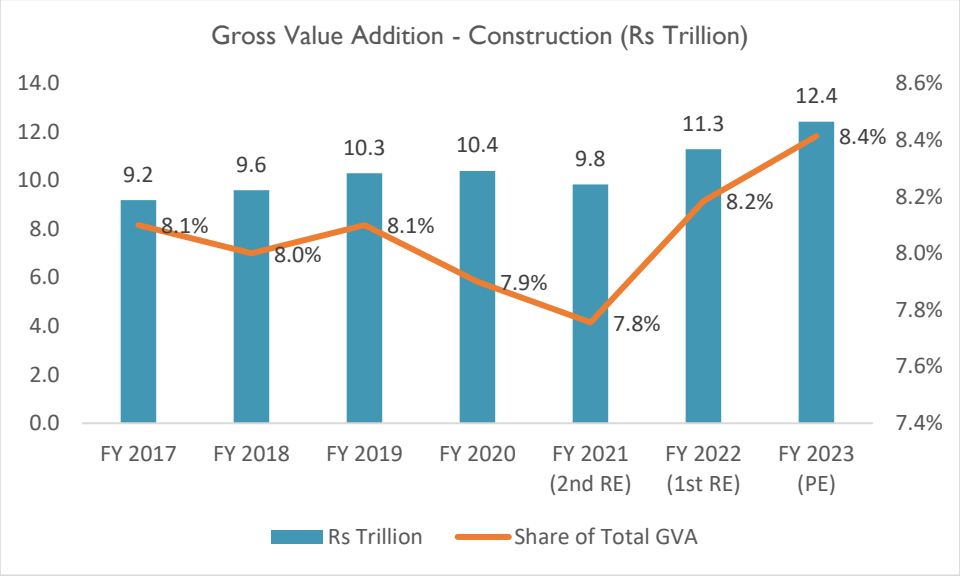
Overview

The construction sector is a key component of the Indian economy with linkages across more than 200+ sub sectors. It is the second largest employment generator in India with nearly 71 million workforce which is expected to cross 100 million by 2030. Further, India is poised to become the third largest construction market in the next 2-3 years on the back of stable economic growth as the real estate sector has emerged to be a critical engine in the country's growth story. As per a Knight Frank report, the construction sector, along with the output generated from real estate services and ownership of dwellings, contributes nearly 18% to the economy's total output.

Cities are a major driver for the construction industry as more than 40% of the population is expected to live in urban India (compared to the current 33%), leading to a demand for 25 million additional mid-end and affordable units by 2030. Further, the Smart Cities Mission targeted at 100 cities is aimed at improving the quality of life through modernized/ technology driven urban planning.

The Indian construction sector is forecasted to reach USD 1.4 trillion by 2025 on the back of the major factors and government initiatives such as the Pradhan Mantri Awas Yojana for affordable homes and Smart Cities Mission, higher adoption of green building systems, advanced technology and automation etc.

As per the estimates released by the Ministry of Statistics and Program Implementation, the real gross value added in the construction industry across India increased by 15% and 10% for FY 2022 and FY 2023 respectively (at 2011 – 12 prices). With the exception of the pandemic period i.e. 2020 (FY 2021), the gross value addition of the construction industry has grown consistently recording nearly 5% CAGR from FY 2017 – 2023. Its share in overall GVA for FY 2023 stood at 8.4% thus crossing the pre pandemic level of 8.1% thus indicating that construction activities have reached normalcy levels on the back of economic growth. This positive development is based on increased government spending on infrastructure as well as faster than expected demand growth in the real estate sector. The housing sector especially is seeing stable demand, on the back of low loan rates, deductions in stamp duty announced by several state Governments as well as drop in property price volatility.



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

The government has identified infrastructure as a priority sector to bolster GDP growth. Various reforms have been introduced from time to time to attract investment in infrastructure. Infrastructure sector was opened to private participation post-liberalization in 1991 and currently up to 100% FDI under automatic route is allowed in most sectors/activities.

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

India has emerged as a safe investment destination in the last decade. The construction development segment (townships, housing, built-up infrastructure and construction-development projects) is the seventh largest FDI recipient with its share in total FDI inflows standing at nearly 4% (at the end of June 2023) and cumulatively amounted to INR 3,407 billion from Apr 2000 – March 2023.

Segment	FY 2021 INR Bn	FY 2022 INR Bn	FY 2023 INR Bn	Cumulative FDI From Apr 2000-June 2023 INR Bn
Construction Development *Townships, housing, built-up infrastructure and construction-development projects*	31.17	9.32	11.96	1,294.32
Construction (Infrastructure) Activities	582.40	241.78	135.88	2,113

Source: Department for Promotion of Industry and Internal Trade

Real Estate Scenario

The post-Covid period from 2021, witnessed gradual revival in the real estate sector on the back of economic revival, increasing per capita income and strong credit growth from financial institutions among others. The growth of the sector is well complemented by the growth in urban and semi-urban areas as well as growth in the corporate environment and demand for office space. A robust demand, attractive and affordable opportunities, policy support and increasing investments all are collectively contributing to the growth of this sector.

PE investments in the real estate sector are expected to remain a little tepid in the short run. According to Knight Frank India, private equity (PE) investment in the Indian real estate sector declined by 20% to USD billion in the first half of 2023 as a result of a conservative shift in investment strategies. However, the overall PE investments in the real estate sector are estimated to touch USD 5.6 billion in 2023, recording a 5.3% Y-o-Y growth on the back of broad-based growth of the economy.

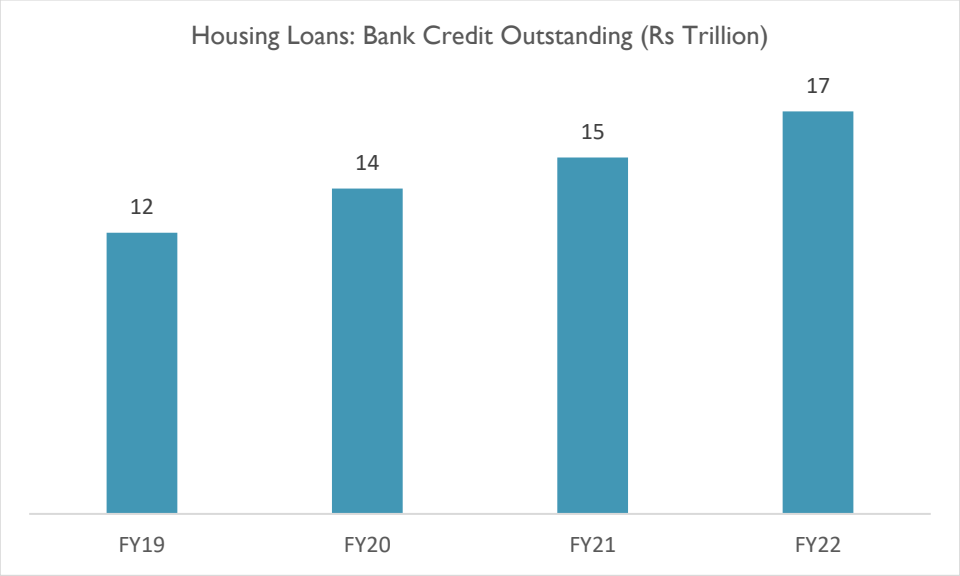
The office sector accounted for the largest share of 68% amounting to nearly USD 1.8 billion in H1 2023 showing 24% growth Y-o-Y owing to the resilience of the investable grade office assets. On the other hand, the warehousing sector which accounted for the second largest share of 21% showed a contraction in H1 2023, with an amount of USD 555 million compared to USD 1.2 billion in the same period of the previous year. The residential sector accounted for 11% share with 3 regions Mumbai, NCR and Bengaluru accounting for more than 90% of the PE investments in the residential sector.

The residential segment is expected to play a major role in driving the growth of the real estate sector in India. According to the Economic Times Housing Finance Summit, about three houses are built per 1,000 people per year in India compared with the required construction rate of five houses per 1,000 population. The current shortage of housing in urban areas is estimated to be ~10 million units and an additional 25 million units of affordable housing units are required by 2030 to meet the country's growing urban population.

Residential Real Estate Scenario

Since the outbreak of the pandemic, Indian homebuyers' goals have shifted as in addition to cost, now better-quality real estate and a better location have become crucial factors in decision-making. The pandemic caused millennials, who were previously thought of as the generation of renters, to change their preference from renting spaces to buying homes. While it's more likely that older generations will make up the majority of the demand for residential space, the younger generation, which includes Gen Z and late millennials (those who are 33 years old or younger), will become more active as they gradually enter the housing market. Also, the continued adoption of a hybrid workplace model is changing the dynamics as a property's quality and surroundings are turning out to be just as important as the unit itself in terms of surroundings. Therefore, places with good physical and social infrastructure will serve as the focal point for future housing developments.

In India, owning a home is still one of the most fundamental but aspirational demands. Most of the purchasers choose a mortgage due to lower disposable incomes and large capital values. According to RBI, the share of residential housing loans in total advances has increased from 8.6% in March 2012 to 14.2% in March 2023 – an indication of the increasing demand in the residential housing sector. Outstanding bank credit for housing loans has grown on an average of 12.7% from FY 2019 – FY 2022. Multiple factors such as the rising disposable income, higher opportunities for availability of credit, increasing emergence of nuclear families etc. are all contributing to the growth of the residential real estate sector.



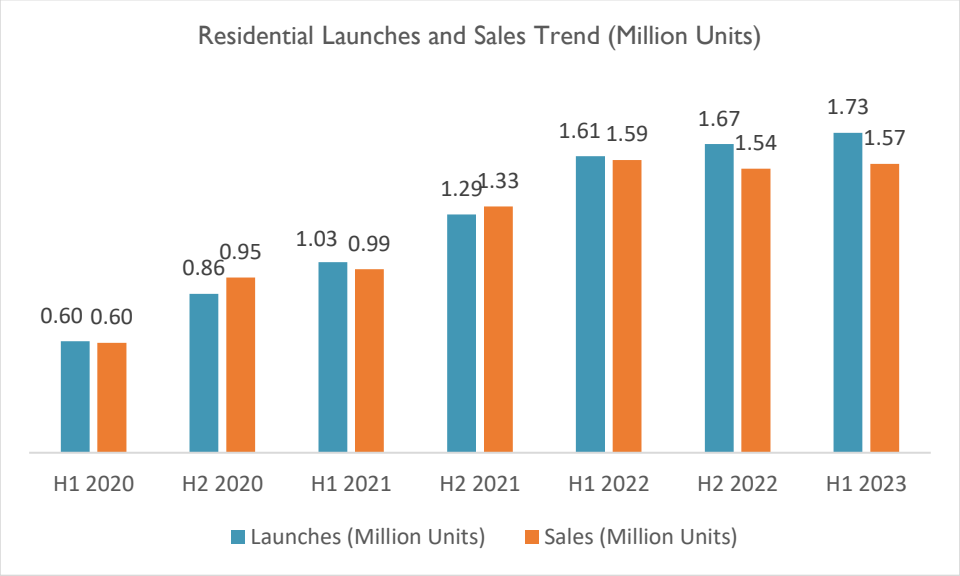
Source: Reserve Bank of India (RBI)

The RBI hiked the repo rate by 250 bps since May 2022 and the last 25 bps hike in Q1 2023 pushed the home loan rates within striking distance of those existing in pre-pandemic 2019. Regardless, the residential market entered 2023 on a relatively stable footing with the first half of the year registering sales of 1.6 million units, showing a miniscule decline of 1% lower y-o-y. While this is the second highest sales volume in almost 10 years, the annual growth has flattened in H1 2023 compared to the strong double-digit growth seen in the preceding four half yearly periods. However, considering the country's economic trajectory, this slowdown in growth could be viewed as a short-term pause.

The real estate industry seems to continue with consolidation as residential developments are steadily shifting into the hands of stronger and larger developers which have the financial capabilities to overcome economic hurdles in the longer. While ready inventory remains a strong preference for homebuyers, they are also displaying interest for the under-construction inventory. With inflation under control, the RBI has shifted its stance to prioritise economic growth by maintaining liquidity which bodes well for the real estate market.

According to the report 'India Real Estate – Residential and Office Market (Jan – June 2023)' by Frank Knight India Pvt Ltd, the residential market has been on a strong recovery path as it crossed a nine-year high in terms of annual residential sales in 2022 as the country emerged gradually from the pandemic's shadow.

The consistent sales volumes have resulted into intense development activity over the past two years as developers keenly started new projects and the volume of units launched exceeded that of sales in the past three half yearly periods - an event that has not occurred since H2 2014. 1.7 million units were launched during H1 2023 recording 8% growth in Y-o-Y terms.



Source: India Real Estate - Residential and Office Market - January - June 2023, Knight Frank

The relative stability in sales was sustained across the major markets with the Y-o-Y percentage change in sales levels not exceeding single digits for any of the regions. In H1 2023, Chennai showed the highest sales growth with 5% Y-o-Y whereas Mumbai and Bengaluru recorded decline of 8% and 2% respectively.

Region	Launches (Units)		Sales (Units)	
	H1 2023 (YoY change)	2022 (YoY change)	H1 2023 (YoY change)	2022 (YoY change)
Mumbai	50,546 (6%)	90,434 (29%)	40,798 (-8%)	85,169 (35%)
NCR	29,738 (4%)	63,233 (207%)	30,114 (3%)	58,460 (67%)
Bengaluru	23,542 (11%)	43,420 (42%)	26,247 (-2%)	53,363 (40%)
Pune	21,234 (22%)	38,640 (-5%)	21,670 (-1%)	43,410 (17%)
Chennai	22,851 (7%)	43,847 (23%)	15,355 (5%)	31,046 (28%)
Hyderabad	10,556 (2%)	20,809 (42%)	7,982 (-3%)	14,062 (58%)
Kolkata	6,776 (1%)	12,330 (64%)	7,324 (3%)	12,909 (-10%)
Ahmedabad	8,122 (7%)	15,416 (21%)	7,150 (3%)	14,248 (19%)
All India	**173,364 (8%)**	**328,129 (41%)**	**156,640 (-1%)**	**312,666 (34%)**

Source: India Real Estate - Residential and Office Market - January - June 2023, Knight Frank

Office Space Real Estate Scenario

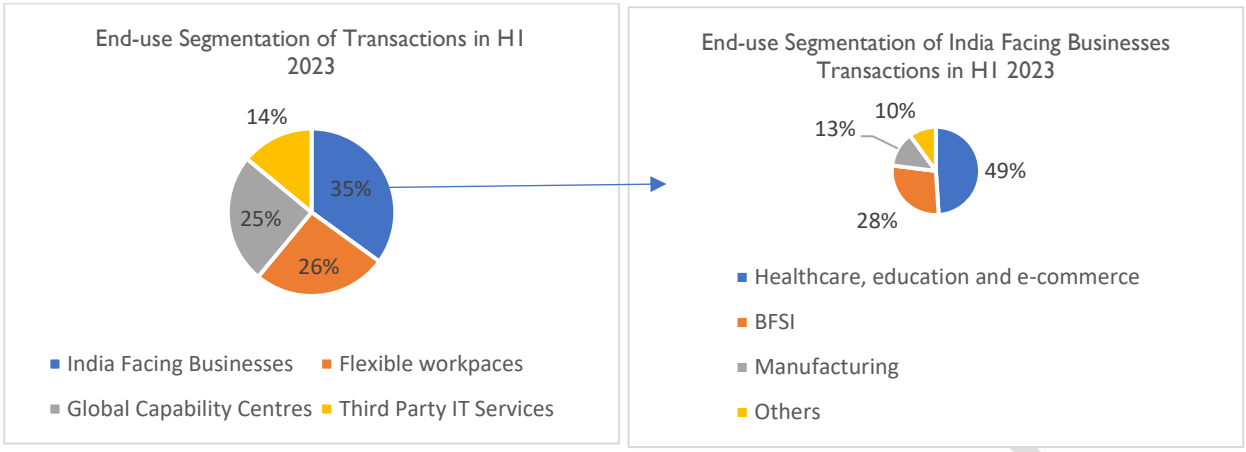
Most of the office spaces around the globe have been struggling with the adverse impact of slowdown in economic activity coupled with rising inflation and threat of a recession (which has been further exacerbated by the Russia Ukraine conflict). Although the Indian economy has not been fully insulated, timely interventions through government policies and RBI measures have ensured that inflation did not spiral out of control and economic growth managed to stay on trajectory as the country's GDP recorded 7.2% growth for FY23. Further, India managed to overtake UK and emerge as the fifth largest economy in the world this indicating its strong position amidst a challenging environment.

According to the report 'India Real Estate – Residential and Office Market (Jan – June 2023)' by Frank Knight India Pvt Ltd transaction volumes for office space ranged between 25 – 26 million square feet over the past four half yearly periods thus indicating the resilience of the Indian office space segment. The 26.1 million square feet transacted during the H1 2023 period represents a modest 3% Y-o-Y growth in volume. In fact, the momentum seems to be gaining as the 14.8 million square feet transacted in Q2 2023 was the highest quarter tally since Q1 2021. While office space demand remained resilient, the supply volumes (i.e. completions) dropped by nearly 25% Y-o-Y in H1 2023. The comparatively lower completed office space of 18 million square feet delivered during H1 2023 have pulled down vacancy level from 17% in H1 2022 to the 16.4% currently. This lower volume of office completions has thus helped the market to maintain a healthy equilibrium as the global headwinds could still turn out to be challenging in the near future.

Parameter	2022	2022 Change (Y-o-Y)	H1 2023	H1 2023 Change (Y-o-Y)
Completions (Million Square Feet)	49.4	28%	18	-25%
Transactions (Million Square Feet)	51.6	36%	26.1	3%

Source: India Real Estate - Residential and Office Market - January - June 2023, Knight Frank

Due to favourable economic conditions, India facing businesses have been gaining traction in recent times with increasing capital inflow. A clear indication of this trend can be observed by the increasing volume of office space taken up by India facing businesses which has amounted to 35% of the total volume transacted in H1 2023. Other service sector companies from the healthcare, education and e-commerce segments constituted approximately 49% of these India facing businesses while BFSI and manufacturing companies accounted for 28% and 13% of the same. Further, the demand for flexible spaces has been rising consistently over the past few years and its share accounted for nearly 26% in H1 2023 indicating its rapid adoption by corporate India.



Source: India Real Estate - Residential and Office Market - January - June 2023, Knight Frank

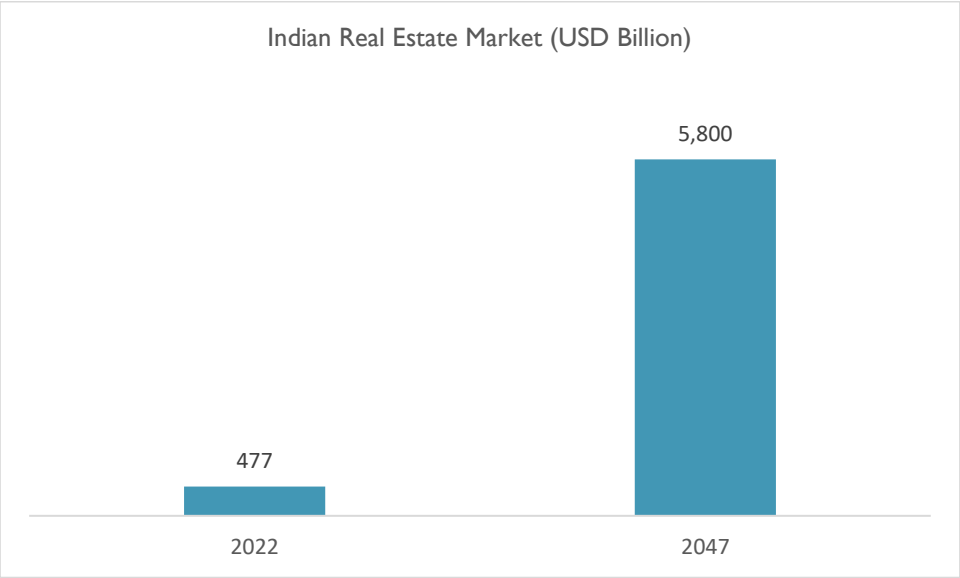
Transaction volumes in Chennai and NCR recorded the highest growth of 107% and 24% Y-o-Y respectively during the period. Bengaluru with 7.0 million square feet, constituted 27% of the area transacted. NCR with 5.1 million square feet, stood at the second position followed by Chennai and Mumbai at 4.5 million square feet and 3.2 million square feet respectively. Bengaluru and NCR accounted for nearly 57% of the total space delivered during H1 2023.

Region	Office Transactions (Million Square Feet)		Office Completions (Million Square Feet)	
	H1 2023 (YoY change)	2022 (YoY change)	H1 2023 (YoY change)	2022 (YoY change)
Mumbai	3.2 (9%)	6.4 (69%)	1.4 (37%)	2 (-59%)
NCR	5.1 (24%)	8.9 (39%)	4 (58%)	7.9 (53%)
Bengaluru	7 (-10%)	14.5 (19%)	6.4 (10%)	15.6 (31%)
Pune	2.3 (-30%)	6.2 (61%)	2.6 (-49%)	6.7 (-8%)
Ahmedabad	0.5 (-59%)	2.2 (88%)	0.3 (-81%)	1.4 (-42%)
Chennai	4.5 (107%)	5.6 (44%)	2.3 (-26%)	4.4 (150%)
Hyderabad	2.9 (-8%)	6.7 (12%)	1.3 (-76%)	11.2 (145%)
Kolkata	0.6 (-3%)	1.1 (42%)	0 (-100%)	0.2 (-70%)
Total	**26.1(-3%)**	**51.6 (-36%)**	**18.0 (-25%)**	**49.4 (-28%)**

Source: India Real Estate - Residential and Office Market - January - June 2023, Knight Frank

Outlook for the Real Estate Sector

According to a report 'India Real Estate: Vision 2047' released by National Real Estate Development Council and Knight Frank India, the Indian real estate sector is estimated to increase by more than 12-fold to USD 5.8 trillion (USD 5,800 billion) by 2047 from USD 477 billion last year. The sector is expected to contribute over 15% to the total economic output of the country in 2047 from an existing share of 7.3%.



Source: India Real Estate: Vision 2047, National Real Estate Development Council and Knight Frank India

The size of the residential real estate market is estimated to grow to USD 3.5 trillion in 2047 from USD 299 billion last year. The size of the office real estate market is likely to grow to USD 473 billion from USD 40 billion, while the warehousing market is expected to reach USD 34 billion from USD 2.9 billion.

According to Knight Frank India there will be an estimated requirement of 230 million units of housing in India by 2047. The demand for housing is expected to remain concentrated in the affordable housing segment, which is expected to gradually shift towards mid segment and luxury housing. The share of lower income households will reduce from existing 43% currently to 9% in 2047. The growth will be primarily driven by favourable economic conditions, government policies, alternative investment models and increasing per capita income among others.

According to the report, Real Estate Investment Trusts (REITs) in the coming years are expected to expand into diverse sectors such as residential and warehousing, in addition to the office and retail segments. Further, builders could also explore opportunities by venturing into REITs for alternative asset classes like data centers, hospitality, healthcare and education.

Industrial Construction Scenario

Construction sector is one of the major segments that drives an economy. Growth in the number of construction projects creates as well as strengthens the demand for a myriad range of products and services. These include project management services, EPC/EPCM services and architecture consulting services, to name a few.

In industrial segment, with rising number of projects and complexities in the scope of work, the responsibility of successful project execution has shifted from project owner/developer to EPC and EPCM contractors. For industrial plants spanning across chemical, fertilizer, oil & gas and petroleum sector, amongst other, prominent turnkey solution and services provided by EPC companies include Site Investigation Service, Project Management, Procurement & Supply, Design & Detail Engineering, Manufacturing & Erection of Equipment, Installation and Mechanical Completion, Piping, Instrumentation, Commissioning, Performance Guarantee Test Run, and Operation & Maintenance, amongst others.

EPC contractors carry out the detailed engineering design of the project, procure all the equipment and materials necessary, and then construct to deliver a functioning facility or asset to their clients. The scope of EPC service also varies according to the sub segment within the industry. The type of services required by an infrastructure developer would be entirely different from a residential real estate developer. EPC is a major service sought by infrastructure developer while real estate developers would look for support in building finishing (cladding & glazing), and mechanical, electrical & plumbing works. However, in both cases, the role of MEP specialists becomes critical as MEP needs are turning out to be fundamental requirements of any construction project.

Infrastructure Investment Trend So Far

The government remains committed of creating new and upgrading existing infrastructure to raise the quality of life and ease of living in India to global standards. According to the Report of the Task Force on National Infrastructure Pipeline, the infrastructure investment in 12th Five Year Plan (FY 2013 to 2017) amounted to Rs 36 trillion (at current prices). India's infrastructure investment for FY 2018 and FY 2019 stood at ~Rs 10.2 trillion and ~Rs 10 trillion respectively. During this period, infrastructure investment was predominantly made by the public sector with a share of ~70%. Sector wise, Power, roads and bridges, urban, digital infrastructure and railways observed maximum investment with respective share of 31%, 18%, 15%, 12%, and 10% in total cumulative infrastructure kms pending between FY 2013-19. Together these 5 sectors constituted ~85% of the total infrastructure investment in India during fiscals 2013 to 2019.

The total capital expenditure in infrastructure sectors in India during FY 2020 to 2025 is projected at ~Rs 111 trillion. During this period such as energy (24%), roads (18%), urban (17%) and railways (12%) are expected to account for ~71% of the projected infrastructure investments in India.

Sector	Amount to be invested in FY 2020 - 2025 (Rs Trillion)	% Share in Total Investment

Energy	27	24%
Roads	20	18%
*Urban	19	17%
Railways	14	12%
Irrigation	9	8%
Rural Infrastructure	8	7%
**Social Infrastructure	4	4%
Industrial Infrastructure	3	3%
Digital Communication	3	3%
Agriculture and food processing infrastructure	2	2%
Airports	1	1%
Ports	1	1%
Total	**111**	**100%**

Source: Report of the Task Force on National Infrastructure Pipeline
Note
* Includes Atal Mission for Rejuvenation and Urban Transformation, Smart Cities, MRTS, Affordable Housing, Jal Jeevan Mission
** Includes higher education, school education, health and family welfare, sports and tourism

Government Initiatives and Regulations

The Union Budget 2023 – 24 announcements indicate the government's sustained efforts to boost the real estate and construction sector, which can have a positive impact on the economy as a whole. It places significant emphasis related to infrastructure development, urban planning, affordable housing, domestic manufacturing and energy transition with a focus on sustainability among others. Some of the major announcement include –

- An augmentation of 33% in the capital investment outlay taking it to Rs 10 trillion.
- The enhancement of the PM Awas Yojana with a 66% increase in allocation to Rs 790 bn is a major step towards increasing the availability of affordable housing, thereby providing a boost to the real estate sector.
- The newly established Infrastructure Finance Secretariat will assist all stakeholders for more private investment in infrastructure, including railways, roads, urban infrastructure, and power.
- An annual allotment of Rs 100 billion for the Urban Infrastructure Development Fund to foster urban infrastructure in tier 2 and 3 cities.

RERA & Its Impact

Real estate sector in India is regulated by multiple rules and regulations, which often overlap with each other. The Real Estate (Regulation and Development) Act was introduced in the year 2016 to protect the home

buyers and also make sure that the investments in the field of the real estate industry get uplifted with time. It is playing a critical and transformational role in transforming the real estate sector by bringing greater transparency and better governance practices. Effective addressal of housing issues is increasing the credibility level of the real estate sector and the confidence of the customers.

The residential sector's operational development between 2016 and 22 can be used to gauge the impact of RERA. The performance of the residential sector was primarily a result of the improved transparency and trust injected by RERA, notwithstanding the introduction of larger policy reforms that affected real estate during the same era. Once the new procedure was in place and all parties were in agreement with the modifications made by RERA, residential sector sales and launches improved. The expansion of the residential sector and other drivers of growth, with the exception of the pause caused by the epidemic, have received attention.

The RERA-instituted escrow mechanism allowed for the efficient use of cash. The increased home sales helped developers with their cash flow and lessened their reliance on institutional capital funding requirements. Consequently, the overall effect has been an improvement in the sector's financial health.

REIT & Its Impact

The Real Estate Investment Trust (REIT) - an investment vehicle that invests in rent-yielding completed real estate properties has the potential to transform the Indian real estate sector. Currently, developers incur huge capital expenditure especially in Commercial Real Estate (CRE), on land, construction, interior fit outs, etc. which remains locked for years until the asset generates returns to bredak-even. REIT will help attracting long-term financing from domestic as well as foreign sources. This could improve fund availability to real estate developers and reduce some burden on completed assets by allowing owners of such assets to raise capital from investors against issue of units. Further, for the investors, the REIT can provide a new investment vehicle with ongoing returns, elevated transparency and governance standards.

Also, in 2023, the amendment in the Finance Bill ensured softening the tax impact for REITs and InvITs (Infrastructure Investment Trust) could lead to REITs and InvITs remaining an appealing investment mechanism.

Mechanical Electrical and Plumbing (MEP) Services

Overview

Mechanical, electrical & plumbing (MEP) services is the umbrella term for the range of technical / engineering services in the construction domain that are used to transform a building to be fit for human occupancy. The MEP service provider offers turnkey solution majorly to the residential, commercial, and industrial buildings, airports, hospitals, educational units, hotels, laboratories, research centers amongst others.

MEP services are key elements for efficient functioning of buildings, ensuring proper environmental conditions, energy conservation and compliance with the required building codes and standards for making the building safe and habitable. MEP services need detailed planning, designing, installation and maintenance to optimize performance, provide higher energy efficiency and improve occupant safety and comfort. Breakdown in the MEP system can affect the entire operations of the building and cause great inconvenience to the residents.

Due to the high degree of interaction between the three systems, MEP installations are generally bundled together to avoid conflicts which tend to happen when MEP systems are designed in isolation from each other. As the integrated module is complex in nature, MEP engineering firms use software solutions to speed up the design process.

MEP systems are developed by specialists as it involves complex designs, coordination, and detailing issues. Additionally, to operate at maximum capacity and minimal errors, they must meet several designs, installation, commissioning, operating and maintenance thresholds and standards.

The key components of MEP include:

- **Mechanical Engineering:** Mechanical systems are generally those systems associated with HVAC (heating, ventilation, air conditioning systems) but can also comprise elevators, escalators, fire protection systems etc. The three most common types of mechanical design work in commercial construction include space heating, air conditioning and mechanical ventilation. Such systems interact with each other to ensure that temperature and humidity is maintained within a certain pre-determined range deemed suitable for the inhabitants. Mechanical design involves laying out optimal routes for heat distribution systems such as air ducts, hydronic piping, or steam piping.
- **Electrical Engineering:** The deals with distribution and supply of electricity, communication systems, control and security systems, alarm detection, interior and exterior lighting etc. In high-rise construction finding the optimal routes for conduit and wiring is one of the major challenges which can be overcome by using MEP which allows conduit and wiring to be laid out with minimal circuit lengths and avoid location conflicts with mechanical and plumbing installations. During the MEP design process, mechanical and electrical engineers collaborate closely on HVAC systems as the mechanical engineers calculate heating and cooling loads to determine equipment capacities, while the electrical

engineers design the electrical circuits and protection measures that allows equipment to operate continuously and safely.

- **Plumbing Engineering:** Plumbing systems comprise pipes, tubes, tanks, valves etc. that facilitate the movement and storage of fluids used for water supply, treatment and recovery, waste removal, heating and cooling etc. MEP plays a key role for plumbing systems as they interact with both mechanical and electrical systems. For example, high-rise buildings typically need water booster pumps that require electricity. Domestic hot water systems get their heat through a boiler, or a heat exchanger connected to a space heating boiler or an electric heater.

Some of the most common MEP services deployed in construction industry include:

Mechanical Engineering	**Electrical Engineering**	**Plumbing Engineering**
- HVAC Systems - Central Plant Design - Exhaust Systems - Direct Digital Control Systems - Heating Water Systems - Chilled Water System	- Comprehensive Electrical System Design - Onsite Power Generation Requirements and Distribution - Integration of IT and AV (audio visual) Into Overall Building Design - Device Coordination and Arc Fault Services - Lightning Protection Systems - Fire Alarm Systems	- Hot and Cold-Water Systems - Water Conservation Systems - Domestic Waste and Vent Systems - Storm Water Systems - Automatic Sprinkler Systems - Fuel Gas Piping Systems
Energy Management	**Lighting Design**	**Communication Technologies**
- Thermal Storage Systems - Energy Recovery Systems - Free Cooling Systems - Utility Monitoring Systems - Chilled Beam Systems - Displacement Ventilation Systems - Dedicated Outside Air and Underfloor Air Distribution Systems	- Architectural Lighting Plan Design - International Design and Lighting Specifications - Lighting Control Design - Renderings and Other Lighting Visualization Techniques - Illuminance Calculations - Color Temperature Analysis - Custom Lighting Design	- Voice, Data and Video Integration - Security and Alarm Systems Integration - Audio/Visual System Design
Commissioning		**Sustainable Design**
- Design Stage Reviews		- Cost Effective Designs

- Functional Testing - Owner Training - System Documentation	- Leadership in Energy and Environmental Design (LEED) Consulting - Exploring Alternative Sources of Energy - Energy Conservation Technologies - Energy Modelling

Role of MEP in Construction: Benefits & Advantages

MEP firms can provide value at every stage of the construction process from providing comprehensive schematic designs to administration and monitoring during the post occupancy stage. The MEP model covers all major aspects of the construction project such as development of preliminary design (in conjunction with the architect's plans) involving detailed drawings and diagrams of all floor plans, elevations and sections, technical specifications on the systems to be installed, list of materials needed, overview of execution methods for the materials, products, and systems etc.

Investment can be maximized through a range of services such as building evaluation, system diagnostics, feasibility studies etc. By working with all major stakeholders such as the architects, contractors, building owners, project management team etc. a common plan can be developed reducing friction between different stakeholders at later stages.

Some of the key benefits & advantages accrued due to the inclusion of effect MEP services during construction phase include:

- **Efficient Energy Usage:** Energy cost is one of the major operating expenses incurred in a building, with energy demand coming from multiple aspects like heating, ventilation, and lighting. In 2021, the building sector – including construction & operation – accounted for approximately 34% of global energy consumption[3]. Effective MEP system can be designed to reduce the energy consumption by introducing system components such as lighting device efficiencies as well as through building system controls such as day lighting.
- **Controlling Emissions:** Building and construction sector accounted for nearly 37% of energy and process related carbon dioxide emission in 2021[4]. With countries across the world agreeing on reducing the green house gas (GHG) emissions, the need to control emissions from building & construction sector is becoming increasingly important. MEP service providers play a major role in this by designing & implementing sustainable systems that optimises energy usage thereby helping control carbon dioxide and GHG emissions.

[3] UN Environment Program, 2022 Global Status Report for Buildings and Construction
[4] UN Environment Program, 2022 Global Status Report for Buildings and Construction

Market Scenario

Transitions in the Industry

The global market for MEP services is driven by infrastructure development happening across the world. Across developing economies, there is a relentless push to improve infrastructure pertaining to commercial, residential, industrial, and civil construction and this push is creating demand for MEP services. Meanwhile in the developed world the demand for MEP services is driven by upgradation of infrastructure facilities.

Based on service, the global MEP market is categorized into three segments: consulting & engineering, maintenance & support, and system integration. North America is the largest market, but the growth has shifted to Asian market owing to the presence of some of the fastest growing developing economies in the world.

The industry is witnessing the emergence of several trends, all in a bid to improve efficiency and reduce cost. 3D modelling and virtual project planning are two such trends which is gaining strength in the industry, as they have proven to be effective in driving down cost, transferring to improved profit margins. However, the adoption of these trends is currently limited to top players, and primarily in developed markets.

Technological investments that are required to integrate these practices is emerging as a roadblock for small and medium sized firms in the industry. Moreover, usage of 3D modelling and virtual project planning is still to gain precedence, and there are not many customers who would be willing to move from tried and tested model to these new approaches. Nevertheless, as technology progresses these trends (and other emerging trends) will become more of a norm rather than a novelty.

The adoption of digital technologies by global MEP industry has hastened in 2020 and 2021, in response to the spread of covid-19. Adoption of digital technologies has become more of a necessity for the industry, to tide over the troubled times. The focus on outcome-based design has increased, as consumer demand has witnessed a drastic change. With fast spreading of covid virus in enclosed spaces, Companies were looking at HVAC systems more closely. Recirculated air systems are increasingly making way to clear air options while filtration specifications is becoming more stringent. These changing consumer need have forced MEP industry to invest more on design modelling & simulation, as the industry needs to accurately model real-world conditions.

The increase in remote working is expected to have an impact on the nature of demand for MEP services. With people spending more and more time indoors, there will be increased focus on residential HVAC requirements. MEP industry is expected to see higher interaction levels with retail consumers, and this could increase the operational expenses. To tide over this cost, the industry would be open to adopting more and more digital tools like remote diagnostics using virtual support.

Although the short-term impact of covid-19 on MEP industry has been disastrous – by way of reduced business – the pandemic forced the industry to digitize, something which has been notoriously lacking in this

industry. The industry today has managed to build up its digital automation capability, and this in turn has improved its ability to meet the emerging demand.

Indian Market Scenario

Indian market for MEP services is undergoing a transition. The major factors behind this is the emergence of complex construction projects across all segments of real estate, as well as changes in building codes resulting in mandatory installation of certain products and systems. The changing regulations in electrical voltage systems for different consumer classes (residential, commercial, and industrial) is a major feature that is reshaping the MEP industry. Moreover, the focus on Green Buildings is getting stronger and more and more projects (primarily in commercial real estate space) is vying to get the coveted green certification. This entails compliance with an entirely different set of codes and regulations, which in turn is opening up new opportunities for construction services including MEP services as well as HVAC services.

Today, the world is moving towards smart buildings, wherein the buildings are closely integrated with technology. Smart homes and connected buildings are a reality today, and the penetration of smart devices (from smart speaker to lighting system to locks) is becoming widespread. This calls for a new level of competence and skillsets from the MEP sector, who should be equipped to meet the tall demands from the customer segment. Thus, to stay relevant, the MEP players are finding it integral to invest in upgrading their skills and capabilities, making them more technology friendly.

Key Demand Drivers

The demand for MEP services is directly correlated to the construction sector. The prevailing sentiment in the construction industry is an indicator of the demand scenario existing in the MEP services segment. An increase in the number of construction projects would directly result in higher demand for MEP services, which accounts for 40% of building construction cost. Similarly, any drop-in construction activity would directly impact the demand for MEP services.

The increasing complexities in the construction sector, and a move towards more scientific & organized construction process has led to widespread adoption of centralized MEP services. Earlier these services used to be met through local vendors. The move towards a more organized process has led to preference for a single vendor. Building developers today prefer a single vendor for all its MEP demands.

Thus, it could be stated that the above-mentioned change in construction processes as well as the boom in building construction in India has helped in the growth of MEP services segment. Furthermore, the evolution in building construction standards as well as maturing of regulatory landscape have increased the demand for superior HVAC & associated facilities. This has promoted MEP service providers to develop expertise in these associated services, which is today offered as a bundled service along with their core MEP service.

Growth in Construction Activity in India

Construction activity in India has rebounded strongly in FY 2022 and FY 2023, after the contraction of nearly 6% in FY 2021 due to the impact of Covid-19 pandemic. Strong Government spending on infrastructure development, supportive policy measures (like Production Linked Incentive Scheme) that is triggering a demand in industrial construction, and resumption in real estate construction have all contributed to this rebound.

Some of the key factors that are driving the construction activity in India:

Rapid Urbanization: Urban population increased from 286 Mn to 377 Mn during the past decade (2001-11) and proportion of urban population to total population increased from ~27% to ~31%. Increase in urbanization was synonymous with the rise in service sector that created jobs in urban centers. As a result, the number of cities with population of more than 1 million reached 47 by end of 2011. According to the UN World Urbanization Prospects 2018 report, urban population in India is expected to grow from 410 million in 2014 to 814 million by 2050. At present, around 34% of Indians live in cities and this share is expected to rise to 46% by 2025. This rapid pace of urbanization is expected to create a huge demand for residential units.

Infrastructure Development: As India aims to grow to a USD 5 trillion economy by 2027, Construction sector that include Infrastructure construction will be critical for boosting economic growth as it is the key growth enabler for several other sector. Infrastructure development provides impetus to other sectors like cement, bitumen, iron and steel, chemicals, bricks, paints, tiles, financial services among others. A unit increase

in expenditure in construction sector has a multiplier effect on other sectors with a capacity to generate income as high as five times in other sectors.

The sector enjoys intense focus from the Government which is well reflection in higher budgetary allocations. In Union Budget 2019-20, the government announced to invest INR 100 trillion in infrastructure over the next five years. Consequently, the National Infrastructure Pipeline worth INR 103 trillion spread across over 6500 projects across sectors was launched on 31st December 2019 while the value of projected investment has got revised to INR 111 trillion in May 2020. This translates in per year spending of around INR 22 trillion. The National Infrastructure Pipeline aims to improve the ease of living for its citizen.

Strong Industrial Construction Segment: After the implementation of economic liberalization policies in early 1990s, the industrial investment scenario in India has largely been shaped by market forces. Government's role was mostly related to designing and implementing policies that would at best improve the investment landscape and attract private investment. Rapid economic growth and rise in demand saw an influx of private investment which was directed towards improving the industrial base of India. As a result, several industrial sectors in India went on to add capacity to become amongst largest in the world.

However, the launch of Production Linked Incentive (PLI) scheme by the Government in 2020 to improve domestic manufacturing capability of India is different from policies launched before. For one, the scheme offers direct incentives on incremental sales from products manufactured in domestic units – thereby promoting domestic production. At present PLI scheme is active in 14 industrial sectors, manufacturing products ranging from electronics to medical devices. The scheme has proved successful in attracting industrial investment across all these 14 sectors, triggering a wave of industrial construction projects geared towards capacity expansion (Greenfield / brownfield construction).

Changing Demand Dynamics

Green and Sustainable Construction – Focus on green development and transition to sustainable energy sources wherein MEP services can play a key role in energy conservation practices. With India focusing on achieving its installed renewable energy target of 500 GW by 2030, renewable energy integration is emerging as a key driver of the MEP market with increasing focus on energy efficient MEP systems. The need arises as different types of renewable energy sources such as solar panels, wind turbines, biomass generators etc. have to be integrated with the building's electrical system to power lighting, HVAC and other systems. For example, in modern buildings, hybrid systems combining conventional energy production with renewable energies are integrated into the MEP system which ensures seamless switchover of energy source according to the prevailing demand and supply.

Rising Demand for HVAC Services - Traditionally, commercial, and industrial applications were the primary adopters of the HVAC industry in the country. However, beginning 2000 the usage of HVAC system in residential and retail consumer segment has started becoming more prominent owing to substantial increase in income levels and aspirational changes. Meanwhile in traditional industrial and commercial

segments, the rapid expansion in office space as well as industrialization ensured the demand for HVAC remain strong.

The HVAC market in India is experiencing a gradual shift towards energy-efficient systems, primarily driven by rising energy costs and environmental concerns. The government's initiatives to promote energy efficiency measures, such as the Energy Conservation Building Code (ECBC) and the Standards and Labelling (S&L) program, are playing a crucial role in driving the adoption of energy-efficient HVAC systems.

Additionally, there is a growing awareness of indoor air quality and the need for improved ventilation and air purification, leading to increased demand for HVAC systems that can address these concerns. The industry is witnessing a shift towards technologically advanced HVAC solutions, including smart controls, remote monitoring, and energy management systems, providing enhanced comfort and energy efficiency. With rising energy costs and increasing environmental concerns, there is a growing demand for HVAC systems that consume less energy while providing optimal performance. The adoption of advanced technologies such as smart controls, IoT integration, energy management systems, and improved insulation materials will drive the industry further towards greater efficiency and reduced carbon footprint.

The sectors that employ HVAC systems most in India include commercial buildings, hospitals, hospitality (hotels and restaurants), retail spaces, educational institutions, and industrial facilities. These sectors require efficient HVAC systems to maintain comfortable and healthy indoor environments for occupants.

Buildings account for approximately 20% of energy usage in India, with the share as high as 31% in commercial buildings. Application of MEP systems could result in superior HVAC system to improve energy efficiency in the residential and commercial buildings.

Opportunities & Challenges

Opportunities

MEP services is a specialized type of service as it involves the integration of different system at different levels. An inefficient MEP system can prove to be a high-risk factor for the entire building's system. As MEP providers have the required skill sets and knowledge to handle such operations, developers prefer to outsource these services to MEP specialists who are more capable of handling these activities. Further, with increasing adoption of MEP systems, the relationship between the MEP providers and buyers is shifting from a contractual / transactional basis to a long-term relationship basis which is more collaborative in nature. Also, by outsourcing these services the end users can continue to focus on their core business activities as well as nullify the issues associated with training, maintaining and retaining of skilled workforce required for MEP services.

Along with office buildings, increasing number of commercial complexes such as malls, theatres and shopping complexes are supporting the growth of the MEP industry.

The Indian market for MEP services is undergoing a transition on the back of emergence of complex construction projects across all segments of real estate and infrastructure construction, as well as changes in building codes resulting in mandatory installation of certain products and systems. Policies and standards such as Energy Conservation Building Code (ECBC), Eco Niwas Samhita, and Green Building rating systems have been developed and implemented to encourage the design and construction of efficient buildings. Moreover, the focus on Green Buildings is getting stronger, primarily in the commercial real estate space, as buildings are making serious attempts for obtaining the Green Certification. This entails compliance with an entirely different set of codes and regulations, which in turn is opening up opportunities for MEP services.

Integration of renewable energy and its impact on MEP

The integration of combination of conventional and renewable energy sources is having a significant impact on the overall MEP industry. MEP engineers are increasingly being called upon to design and install renewable energy systems in buildings. This is creating new opportunities for MEP companies and professionals.

The integration of renewable energy sources is also leading to the development of new technologies and products. For example, there is a growing demand for energy storage systems that can be used to store excess renewable energy generated during the day and use it at night or during peak demand periods.

There is a growing trend towards the integration of combination of conventional and renewable energy sources in the construction industry in India. This is being driven by a number of factors, including government policies and incentives, falling costs of renewable energy technologies, and increasing awareness of the environmental impacts of the construction sector.

The Indian government is offering a number of incentives for the use of renewable energy in the construction sector. For example, the government offers a subsidy for the installation of solar panels on commercial and residential buildings. The costs of renewable energy technologies, such as solar panels and wind turbines, have fallen significantly in recent years. This has made them more affordable for construction companies and building owners. There is also increasing awareness of the environmental impacts of the construction sector in India. This is leading to a growing demand for sustainable buildings that use renewable energy sources.

- The Confederation of Indian Industry (CII) Green Business Centre in Hyderabad is a platinum-rated LEED building that uses a combination of renewable energy sources, including solar panels and wind turbines, to meet its energy needs.
- The Infosys campus in Bangalore is a LEED-gold-certified building that uses a combination of renewable energy sources, including solar panels and biogas generators, to meet its energy needs.
- The Delhi International Airport is using a combination of renewable energy sources, including solar panels and wind turbines, to meet its energy needs.

Challenges

Today, the world is moving towards smart buildings, wherein the buildings are closely integrated with technology. Smart homes and connected buildings are a reality today, and the penetration of smart devices (from smart speaker to lighting system to locks) is becoming widespread. This calls for a new level of competence and skillsets from the MEP sector, who should be equipped to meet the tall demands from the customer segment. Thus, to stay relevant, the MEP players are finding it integral to invest in upgrading their skills and capabilities, making them more technology friendly.

Complexity in designing and installation, testing and maintenance are some of the challenges that impact the MEP systems. Lack of skilled labour required for MEP services related to designing, installing and maintenance is a major challenge that could affect the quality of work resulting in system failures.

Indian MEP industry is yet to move into an integrated service level model wherein the industry provides an overarching consulting approach rather than a piecemeal approach. Increasing complexity in Indian construction sector translates into the need for coordination among vendors and services providers across different service segments is becoming a necessity. Although the industry is witnessing improvements in these areas, more work needs to be done to graduate to the next level.

Innovations and Trends in MEP Industry

The rapid growth of commercial infrastructure such as office buildings, retail spaces, hotels, healthcare facilities on the back of economic revival and increasing per capita income are driving the growth of the MEP segment. It is also supported by the increasing demand for energy-efficient and sustainable MEP services to meet environmental regulations and reduce operating costs. Moreover, the rising adoption of advanced technologies, such as BIM, building automation and smart systems etc., in commercial buildings is further boosting the demand for MEP services.

The growth of the construction industry is the primary driver for the growth of the MEP industry. Further, factor such as increasing focus on sustainability/energy conservation, technological advancements and stringent building codes among others are all collectively supporting it.

The rapid growth of cities would boost energy demand for powering buildings thus increasing the importance of measures such as the revised Energy Conservation Building Code (ECBC). The adoption of green building materials and energy efficient HVAC and lighting systems would be at the forefront of such environmentally friendly measures.

The need for improved quality, cost efficiencies and faster construction are driving the implementation of techniques such as aluminium formwork, prefabricated buildings, building information modelling (BIM), etc.

The trend of smart buildings is catching up fast in India which involves the use of advanced and integrated building technology systems such as building automation, facility management, safety systems, tele communication systems etc. They use advanced sensors, IoT devices and data analytics among others to enhance the performance of the building systems, manage energy consumption, improve safety measures etc. MEP firms can leverage these technologies to design intelligent building systems that can monitor and control key variables related to energy, lighting, HVAC etc. on a real-time basis.

Building Information Modelling (BIM)

The conventional approach comprised 2D drawings and MEP coordination was conducted through overlay processes wherein the engineers supplied the designs and details were developed by the experts. The drawings were then compared with a superimposition of the plans to detect conflicting areas. However, a unified approach can result in cost and time savings along with better quality.

Building Information Modelling (BIM) is a 3D digital representation of a building's design that provides key stakeholders such as architects, engineers and construction professionals with the requisite tools needed to plan, design, construct, and manage buildings and infrastructure more effectively. It combines multidisciplinary data to create detailed digital representations that can be maintained in real-time on an open cloud platform.

Building Information Modelling (BIM) enables different stakeholders involved in construction activities such as engineers, architects, contractors, MEP owners etc. to collaborate more effectively in a seamless manner by sharing a single, unified centralized model. It reduces errors, rework and provides precise quantities for

MEP components resulting in more accurate estimates and budgeting. Further, BIM generates detailed and comprehensive documentation comprising designs, schedules, specifications etc. leading to smoother construction and maintenance operations. Some major benefits include –

- Improved Collaboration and Coordination - BIM enables the key stakeholders mainly the MEP engineers, architects, contractors and other stakeholders to collaborate with each other in real-time thus resulting in better coordination and communication ensuring uniformity across the board. This helps in identifying potential conflict areas, finding solutions acceptable to key stakeholders and reduce the risk of rework and overruns among others.
- Enhanced Visualization and Accuracy – A BIM provides a digital 3D representation of the building with streamlined design and construction process, allowing the MEP engineers to identify potential issues and make the necessary adjustments at the initial stage. The visualization also allows MEP engineers to understand the linkages and the interaction between different systems allowing them to improve the quality of work by reducing the risk of rework and errors. It also reduces the need for manual calculations and site visits resulting in time and cost savings.
- Effective Budget Management – Cost estimation and budget management tools are a part of the BIM software which makes it easier for MEP engineers to effectively manage their overall costs.
- Improved Safety – As BIM can be used to simulate different construction scenarios (including potential safety hazards), it allows MEP engineers to detect and mitigate risks before the actual construction begins, thus making the work site safer. BIM also helps to ensure that the MEP systems are installed correctly and comply with all relevant safety standards thus reducing the possibilities of hazardous incidents.
- Improved Project Management – BIM, being a centralized platform for managing all aspects of a building project, from design to construction makes it easier for MEP engineers to track progress, manage resources and timelines and coordinate with other stakeholders thus increasing the overall efficiency of project management.
- Saving on Prefabrication Material –BIM visualization allows contractors to prefabricate material offsite more easily and accurately saving time and money as well as order / procure raw material more accurately to avoid stocking up of inventory.

Some of the disadvantages of BIM for MEP include the cost of software and hardware which can be more expensive than the conventional Computer Aided Design (CAD). BIM also requires a steep learning curve for those who are not familiar with it. The implementation time could also be higher as it requires detailed planning and coordination.

Building Automation

MEP engineering and building automation share a mutually beneficial relationship. An effective MEP design provides the foundation for different building automation systems to operate optimally. For example, MEP-designed HVAC systems must integrate seamlessly with building automation systems to ensure precise temperature control, efficient energy usage and timely maintenance alerts among others. Building automation takes MEP engineering a step ahead by enabling remote monitoring and control resulting in managing control settings, trouble shooting, monitoring etc. without being physically present on-site. The integration of MEP engineering and building automation has a significant positive impact on occupant experience as well as in managing the overall building systems through precise control over temperature, lighting, indoor air quality and other elements. For example, smart lighting systems can adjust lights based on occupancy and availability of natural light whereas automated HVAC systems can adjust based on occupancy levels and climatic conditions. The collaboration of MEP engineering and building automation systems can result in operational efficiency, optimizing costs, enhancing building performance and reduce energy consumption among others.

3D modelling and Virtual Project Planning

Preplanning the design layout and cost approximation is typically estimated during the project initiation phase. The adoption of 3D modelling and virtual project planning helps the stakeholders in designing more accurate layouts or explore design defects at the prototype stage which results in cost and time savings at the later stages. It also serves as a barometer to actually visualize the entire project which could help various stakeholders to offer their suggestions at the initial stage resulting in conflict reduction later. MEP could be a great asset as it also uses 3D modelling for detailed construction visualization and planning.

Competitive Landscape

Indian construction sector, which include developers, material suppliers as well as service providers continues to be a fragmented industry. Small players, with limited geographical presence (regional presence) continues to account for majority share of the industry. This scenario holds true for MEP services too, where small firms which offer individual services or combination of MEP services holds sway. With MEP activities accounting for nearly 40% of the total cost, price-based competition is very much a reality. This price-based competition is most evident in the unorganized construction segment, as all stakeholders work towards finishing the project without cost over runs.

Organized players in the MEP service segment has managed to gain better traction among the organized segment of the construction industry. Large developers executing mega projects can be loosely classified under this tag of organized segment. Since the project scale in this segment tends to be huge, the preference is for a MEP service provider who has end-to-end expertise. Smaller players with regional focus catering to unorganized segment often falls short of the expectations / demand emanating from large construction companies. The wide portfolio of services and ability to service construction projects with a varied level of complexity provides larger firms an advantage in the highly competitive MEP and turnkey construction service segment.

Currently, there are few large players in the segment, with MEP as one of their business segments, providing a wide range of MEP and turnkey construction services to all segments within the construction industry such as Voltas Ltd, Blue Star Electro-Mechanical Ltd., and Sterling & Wilson Ltd. Godrej Green Building Consultancy Services, HOCHTIEF (India) Private Limited (HTI), Associated Building Co. Ltd., Outsource2india, and Bridge & Roof Co. (India) Ltd are few of the major companies.

As the MEP market continues to be fragmented, some of the small and mid-sized players with MEP as their core business include -

Company	Total Income (Rs Million)			CAGR FY 2020 - 2022 (%)
	FY20	FY21	FY22	
Anemo Projects Private Limited	448	268	354	-11.1
Atom MEP Engineers Private Limited	80	20	68	-7.8
BR MEP Engineers Private Limited	68	288	371	133.6
INI Infrastructure & Engineering Private Limited	55	51	58	2.7
MECELP Projects Private Limited	22	18	13	-23.1
PillarPlus Private Limited	0.6	12	12	347.2
QDC India Consulting Private Limited	54	63	93	31.2
Vaya MEP Engineers Private Limited	31	13	25	-10.2

Source: Company Financial Statements

Brief Profile of Notable Players

Company	Brief Description
Anemo Projects Private Limited	In addition to MEP services, provides HVAC EPC projects, electrical EPC projects, interior and exterior works, BMS automation works, AMCs etc. The company has completed 500+ projects with a diverse base of clients such as BHEL, ONGC, IOCL, NTPC, EIL etc.
Atom MEP Engineers Private Limited	A part of the Atom Group, the company in addition to MEP services, is also specialized in acting as Liaising and Approvals Consultants for local & International organizations. Some of the company's major clients include Hyatt, RITES, Domino's Pizza, Larsen & Toubro etc.
BR MEP Engineers Private Limited	MEP services include design, supply, erection / installation, up gradation and commissioning all Mechanical ,Electrical, Plumbing, Fire Fighting & HVAC services. Some of the key clients include NIMR and NCDC in medical segment, ITC Maurya, Radisson and Fortune in hospitality, Guru Gobind Singh Indarprastha University in education and Khajuraho Airport in aviation among others.
INI Infrastructure & Engineering Private Limited	The company provides services for projects in India and internationally with six office locations. Its services portfolio includes MEPF, IT&LV, Infrastructure services, acoustics, lighting design, energy, sustainability and commissioning. Some key projects include Adajan Bus Terminal, Surat, Umaid Heritage Villas, Jaipur, Baku City Mall, Ajairbaijan etc.
MECELP Projects Private Limited	In addition to MEP services, the company provides public health engineering, clean rooms, cold rooms, building energy audits and project consulting. Through its team of BIM modelers and spatial CAD coordinators, designers, visualizers etc. it provides services to commercial buildings, hotels, factories, R&D labs etc.
PillarPlus Private Limited	The company leverages artificial intelligence-based software to automate the generation of MEP drawings/blueprints. The company has worked on more than 200 projects across the globe. Some of its key projects include MCH Hospital, Haridwar; Pashupati Hotel, Nepal; Beach Resort, Panama etc.

QDC India Consulting Private Limited	The company has a strategic alliance with Qatar Design Consortium, Doha – a Qatar based 40-year-old Grade A Consulting and Project Management firm. It provides services to its clients across India, Middle East and US. Some of its key projects include Mega Food Park at Telangana, Sports City at Bangalore, Meditation Centre at Tirupati etc.
Vaya MEP Engineers Private Limited	The company's business portfolio includes MEP services and land development. Some of its key MEP projects include Hilton Hotel at Gurgaon, Nippon Steel Pipe India Ltd at Rajasthan, Sudhir Power Projects Ltd at Delhi etc.

Growth Outlook in Indian MEP Industry

The outlook for the MEP industry is directly proportional to the progress of the construction industry. As the Indian growth story continues with its momentum, industrial infrastructure will be playing a key role in it. Initiatives such as the building of 50 new airports, aerodromes, helipads etc. announced during the FY 2023 – 24 Budget will definitely support the growth of the MEP sector.

As tier-II towns are expected to witness robust demand with the rise in employment opportunities and economic activities in these markets, holistic growth across Tier I, II and III cities are expected to take place in the coming years. Further, the boost in the e-commerce industry and India's emergence as the fastest-growing business & IT hub has led to an impressive demand in the country's commercial real estate. The critical role of MEP in sunrise sectors such as data centers and cold storage will definitely help its acceleration to touch new heights. Emerging trends such as managed office spaces and co-working spaces, which are predicted to grow over 10% - 13% annually over the next three years will also provide more opportunities for the MEP sector to showcase its potential.

The real estate sector could be approaching the phase of consolidation leading to the dominance of large players which typically prefer working with MEP service providers who can deliver end-to-end solutions which helps the developers to focus on their core construction activities. Outsourcing of these MEP related activities could also result in long term agreements with MEP service providers instead of short-term contracts thus signalling a shift in the relationship between the developers and MEP service providers. The transition from a service provider to a solution provider seems to be already taking place as MEP companies are factoring in the new age building structures for long term sustainability. Consequently, such transitions would also translate into employment generation of more skilled MEP personnel.

With limited resources and complex structures coming in place, there would be a dire need to avoid recurrent misinterpretation and workflow disturbances, resulting in project delays and cost overruns. Digital project management which would provide more accuracy in a cost-efficient time would be in great demand. These factors combined with environmental concerns and advent of technology and automation provides the MEP industry a great opportunity to showcase its full potential in the coming years.