

SECTION VII - ABOUT THE COMPANY

INDUSTRY OVERVIEW

The information in this chapter includes extracts from publicly available information, data, statistics and has been derived from various government publications and industry sources. The data may have been re-classified by us for the purposes of presentation. The information may not be consistent with other information compiled by third parties within or outside India. Industry sources and publications generally state that the information contained therein has been obtained from sources it believes to be reliable, but their accuracy, completeness and underlying assumptions are not guaranteed, and their reliability cannot be assured. Industry and government publications are also prepared based on information as of specific dates and may no longer be current or reflect current trends. Industry and government sources and publications may also base their information on estimates, forecasts and assumptions which may prove to be incorrect. This report has to be seen in its entirety; the selective review of portions of the report may lead to inaccurate assessments. The actual outcome may be materially affected by changes in the industry and economic circumstances, which could be different from the projections. Investors should note that this is only a summary of the industry in which we operate and does not contain all information that should be considered before investing in Equity Shares. Before deciding to invest in the Equity Shares, prospective investors should read this Prospectus, including the information in **“Our Business”** and **“Restated Financial Information”** beginning on pages no. 130 and 194 respectively of this Prospectus. An investment in Equity Shares involves a high degree of risk. For a discussion of certain risks in connection with an investment in the Equity Shares, see **“Risk Factors”** beginning on page no. 23 of this Prospectus.

1. Economic Outlook

Global Macroeconomic Scenario

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

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

Global headline inflation is set to fall from an estimated 6.8% in CY 2023 to 5.8% in CY 2024 and to 4.4% in CY 2025. This fall is swifter than anticipated across various areas, amid the resolution of supply-related problems and tight monetary policies. Reduced inflation mirrors the diminishing impact of price shocks, particularly in energy, and their subsequent influence on core inflation. This decrease also stems from a relaxation in labour market pressure, characterized by fewer job openings, a slight uptick in unemployment, and increased labour availability, occasionally due to a significant influx of immigrants.

Global GDP Growth Scenario

The global economy started to rise from its lowest levels after countries started to lift the lockdown in 2020 and 2021. 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, seen in 2022, 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. Further, despite initial resilience earlier in 2023, marked by a rebound in reopening and progress in curbing inflation from the previous year's highs, the situation remained precarious. Economic activity lagged behind its pre-pandemic trajectory, particularly in emerging markets and developing economies, leading to widening disparities among regions. Numerous factors are impeding the recovery, including the lasting impacts of the pandemic and geopolitical tensions, as well as cyclically driven factors such as tightening monetary policies

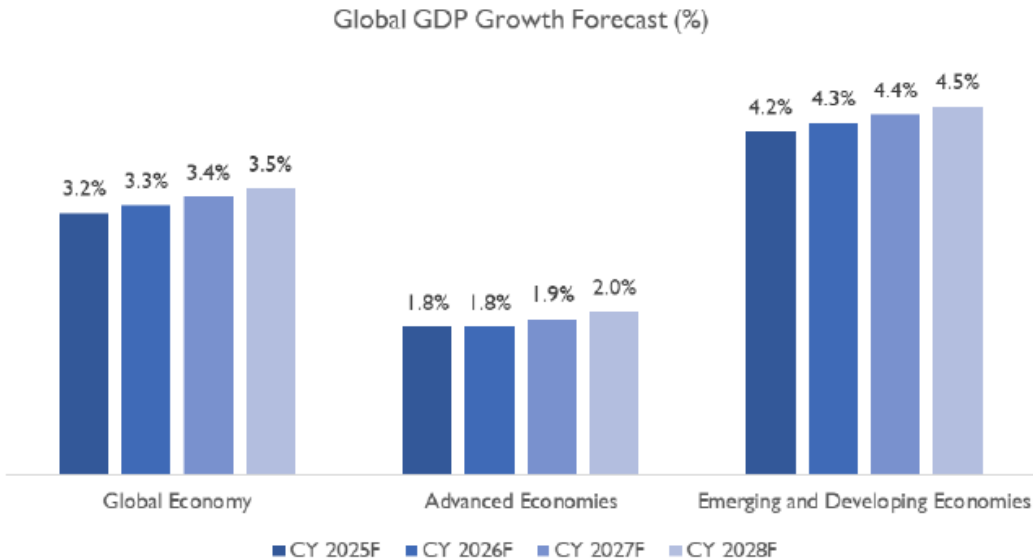
to combat inflation, the reduction of fiscal support amidst high debt levels, and the occurrence of extreme weather events. As a result, global growth declined from 3.5% in CY 2022 to 3.3% in CY 2023.



Source- IMF Global GDP Forecast Release July 2024

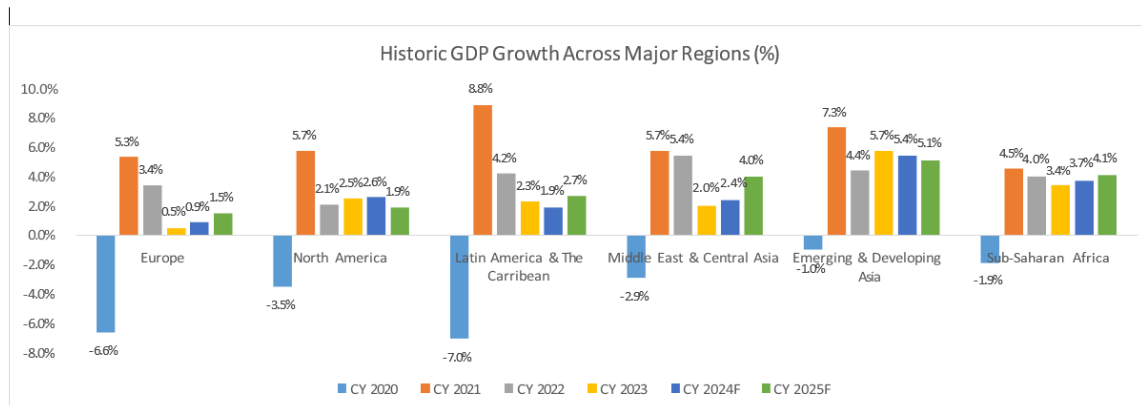
In the current scenario, Global growth is projected to slow from 3.3 percent in 2024 to 3.2 percent in 2025 and 3.1 percent in 2026, with advanced economies growing around 1.5 percent and emerging market and developing economies just above 4 percent. Inflation is projected to continue to decline globally, though with variation across countries: above target in the United States—with risks tilted to the upside—and subdued elsewhere.

Slowed growth in developed economies will affect the GDP growth in CY 2024 and global GDP is expected to record a flat growth of 3.2% in CY 2024. The 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 in 2022, inflationary pressures slowly eased out in 2023. This environment weighs in for interest rate cuts by many monetary authorities.



GDP Growth Across Major Regions

GDP growth of major regions including Europe, Latin America & the Caribbean, Middle East & Central Asia, and Sub-Saharan Africa, were showing signs of slow growth and recession between 2020 – 2023, but leaving Latin America & The Caribbean, 2024 is expected to show resilience and growth. Meanwhile, GDP growth in Emerging and Developing Asia (India, China, Indonesia, Malaysia etc.) is expected to decrease from 5.4% in CY 2023 to 5.2% in CY 2024, while in the United States, it is expected to decrease from 2.5% in CY 2023 to 2.1% in CY 2024.

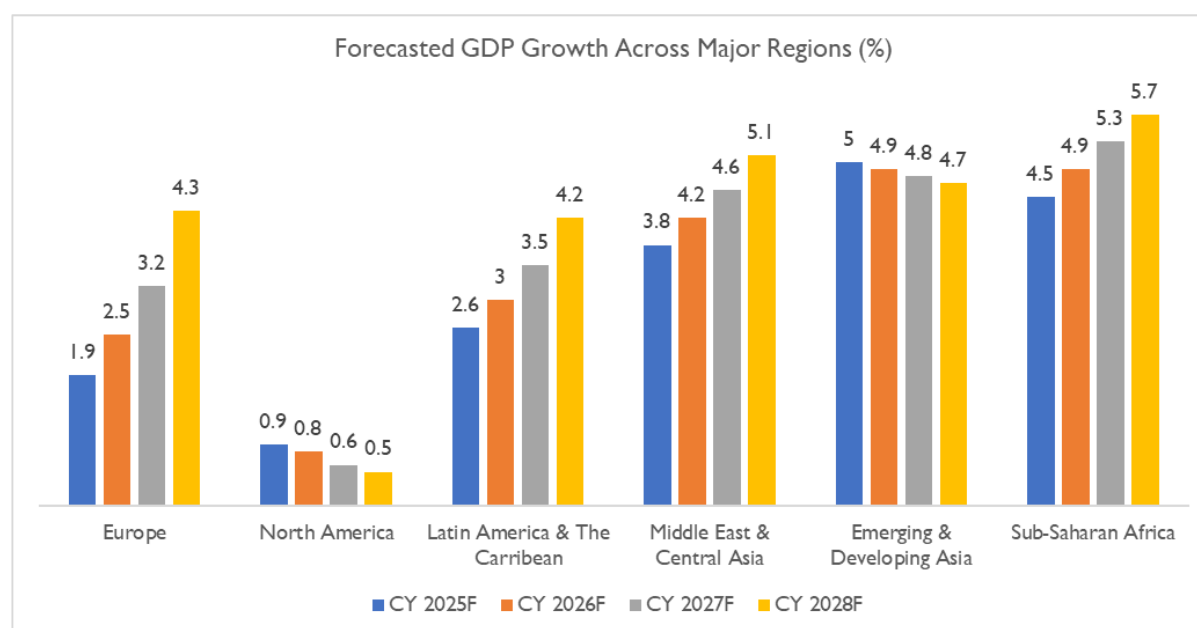


Source-

IMF World Economic Outlook July 2024 update

Except for Emerging and Developing Asia, Latin America & The Caribbean and the United States, all other regions are expected to record an increase in GDP growth rate in CY 2024 as compared to CY 2023. GDP growth in Latin America & The Caribbean is expected to decline due to negative growth in Argentina. Further, growth in the United States is expected to come down at 2.1% in CY 2024 due to lagged effects of monetary policy tightening, gradual fiscal tightening, and a softening in labour markets slowing aggregate demand.

Although Europe experienced a less robust performance in 2023, the recovery in 2024 is expected to be driven by increased household consumption as the impact of energy price shocks diminishes and inflation decreases, thereby bolstering real income growth. Meanwhile, India and China saw greater-than-anticipated growth in 2023 due to heightened government spending and robust domestic demand, respectively. Sub-Saharan Africa's expected growth in 2024 is attributed to the diminishing negative impacts of previous weather shocks and gradual improvements in supply issues.



Source-IMF, OECD, and World Bank and Estimates

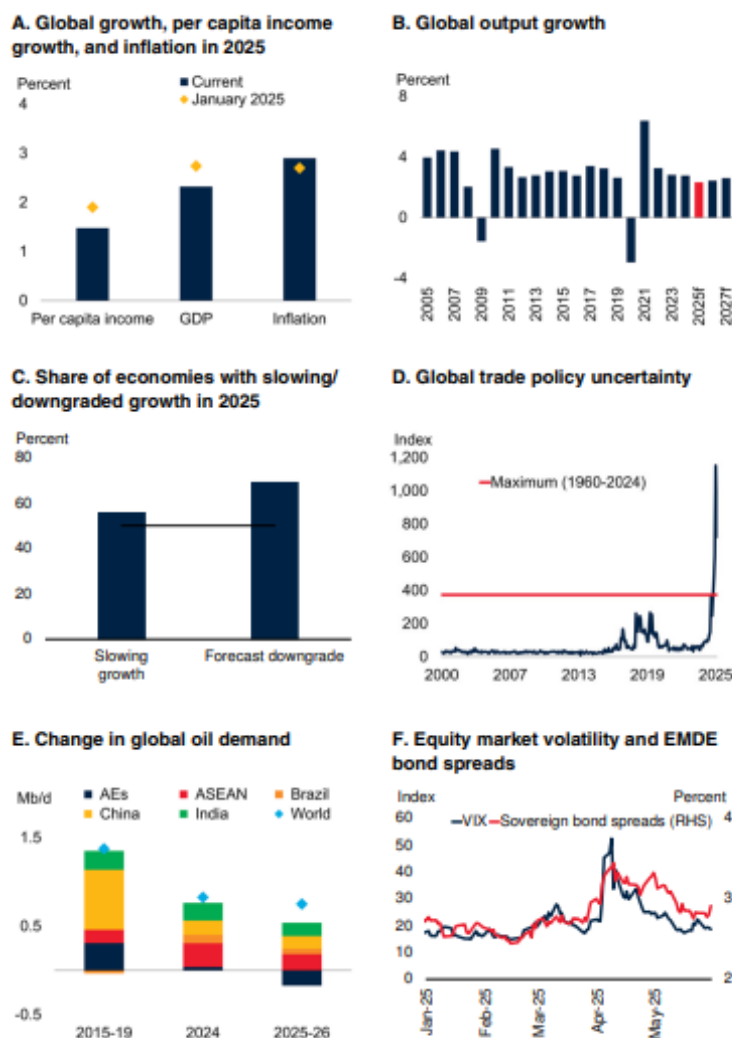
GLOBAL OUTLOOK

Global growth is slowing due to a substantial rise in trade barriers and the pervasive effects of an uncertain global policy environment. Growth is expected to weaken to 2.3 percent in 2025, with deceleration in most economies relative to last year. This would mark the slowest rate of global growth since 2008, aside from outright global recessions. In 2026-27, a tepid recovery is expected, leaving global output materially below January projections. Progress by emerging market and developing economies (EMDEs) in closing per capita income gaps with advanced economies and reducing extreme poverty is anticipated to remain insufficient. The outlook largely hinges on the evolution of trade policy globally. Growth could turn out to be lower if trade restrictions escalate or if policy uncertainty persists, which could also result in a build-up of financial stress. Other downside risks include weaker-than-expected growth in major economies with adverse global spill overs, worsening conflicts, and extreme weather events. On the upside, uncertainty and trade barriers could diminish if major economies reach lasting agreements that address trade tensions. The ongoing global headwinds underscore the need for determined multilateral policy efforts to foster a more predictable and transparent environment for resolving trade tensions,

some of which stem from macroeconomic imbalances. Global policy efforts are also needed to confront the deteriorating circumstances of vulnerable EMDEs amid prevalent conflict and debt distress, while addressing longstanding challenges, including the effects of climate change. National policy makers need to contain risks related to inflation as well as strengthen their fiscal positions by raising additional domestic revenues and reprioritizing spending. To facilitate job creation and boost long-term growth prospects in EMDEs, reforms are essential to enhance institutional quality, stimulate private investment growth, develop human capital, and improve labor market functioning.

Regional Prospectus

All EMDE regions face a challenging outlook amid the rise in trade tensions and heightened global uncertainty. In 2025, growth is projected to slow in East Asia and Pacific as well as in Europe and Central Asia—both regions that are highly reliant on global trade—and, to a lesser extent, in South Asia. In Latin America and the Caribbean, growth is projected to be the lowest among EMDE regions over the forecast horizon, as activity is held back by high trade barriers and longstanding structural weaknesses. In regions with a large number of commodity exporters, including in the Middle East and North Africa and Sub-Saharan Africa, growth is anticipated to face drags from the weakening outlook for external commodity demand. Against the backdrop of a deteriorating global environment, growth forecasts for 2025 have been downgraded in all EMDE regions relative to January projections. After being buffeted by a series of adverse shocks over 2020-24, the global economy is facing another significant headwind this year, with increased trade barriers and heightened policy uncertainty leading to a notable deterioration of the outlook relative to January (figure 1.1.A). In particular, global output is expected to grow at its weakest pace since 2008, aside from outright global recessions (figure 1.1.B). The sharp increase in tariffs and the ensuing uncertainty are contributing to a broad-based growth slowdown and deteriorating prospects in most of the world's economies (figure 1.1.C). Subdued global growth prospects are unlikely to improve materially without policy actions to address increasing trade restrictions, geopolitical tensions, heightened uncertainty, and limited fiscal space. The global outlook is predicated on tariff rates close to those of late May prevailing throughout the forecast horizon. Accordingly, pauses to previously announced tariff hikes between the United States and its trading partners are assumed to persist. This baseline nonetheless entails the highest U.S. average effective tariff rate in nearly a century. In addition, in view of recent rapid shifts in trade policies and the potential for a return to even higher tariffs, consumers and businesses continue to grapple with unusually elevated uncertainty (figure 1.1.D). In this context, a prospective recovery in global trade and investment—two important drivers of long-term development that have been relatively subdued in recent years—has been disrupted.



Sources: Caldara et al. (2020); Haver Analytics; International Energy Agency (IEA); J.P. Morgan; UN World Population Prospects; World Bank.

Note: f = forecast. AEs = advanced economies; ASEAN = Association of Southeast Asian Nations; EMDEs = emerging market and developing economies; mb/d = million barrels per day; GDP aggregates calculated using real U.S. dollar GDP weights at average 2010-19 prices and market exchange rates.

A. Blue bars "current" correspond to the current edition of the *Global Economic Prospects* (GEP) report and yellow diamonds "January 2025" correspond to the January 2025 edition of the GEP.

B. Data for 2024 are estimates; data for 2025-27 are forecasts.

C. Panel shows the share of economies with slowing growth and with growth outlook downgraded relative to January 2025 forecasts. Horizontal line shows 50 percent.

D. Trade Policy Uncertainty Index, based on automated text searches of the electronic archives of seven newspapers. A higher value indicates higher trade policy uncertainty. Last observation is May 2025.

E. Bars indicate the average change in annual oil demand in mb/d for the selected periods. Data based on IEA's Oil Market Report, May 2025 edition. 2025 and 2026 are projections.

F. Blue line represents the daily CBOE Volatility Index, which measures market expectations of near-term volatility conveyed by stock index option prices. Red line represents the median sovereign bond spread for a sample of up to 71 EMDEs. Last observation is May 30, 2025.

Commodity prices plunged in early April in response to deteriorating growth prospects. Oil prices posted an especially large decline, with the effects of a notable hike in oil production by OPEC+ nations compounded by a muted outlook for oil demand growth (figure 1.1.E). Base metal prices also dropped as markets priced in substantial headwinds to global manufacturing and industrial activity but have since partially recovered. Overall commodity prices are forecast to decline by 10 percent in 2025, softening further in 2026—mainly due to falling oil prices. Global headline inflation generally remains elevated relative to central bank targets and pre-pandemic averages and has even risen in some advanced economies since late last year. Slower disinflation globally over the last six months has largely reflected continuing inflationary pressures from services prices. The recent rise in consumer inflation expectations has been influenced by the implementation of trade restrictions. In addition, core inflation in some economies is expected to remain high due to persistent services price increases. In all, GDP-weighted global inflation is projected to average 2.9 percent in 2025 and 2026—still a little above the average inflation target—but with notable heterogeneity across economies.

Global financial conditions have been tighter this year, on average, relative to late 2024, principally reflecting trade policy uncertainty. Volatility in financial markets spiked and equity markets plunged globally as trade tensions escalated in early

April; however, asset prices largely recovered after an initial 90-day tariff pause was announced and following the rollback in U.S.-China tariffs in May. Long-term government bond yields in major advanced economies have increased since late last year, albeit with pronounced volatility. EMDE financial conditions are also somewhat tighter, on average, relative to late last year. In early April, many EMDEs saw sharp declines in equity markets amid a surge in capital outflows. Sovereign spreads rose, albeit to differing degrees based on economies' exposure to announced trade barriers. Nevertheless, EMDE equity markets regained ground and spreads narrowed again following the partial de-escalation in trade tensions.

Against the backdrop of heightened policy uncertainty and increased trade barriers, the global economic context has become more challenging, with the risk of further adverse policy shifts materializing, particularly with respect to trade relations among the largest economies. The rise in trade restrictions clouds the near-term trade outlook—despite solid trade growth earlier this year, which partly reflected the front-loading of imports by some large economies in anticipation of tariff hikes. Beyond the direct impact of higher tariffs, the potential for further rapid shifts in the timelines and magnitudes of trade-restrictive measures is a source of sentiment-sapping policy uncertainty. Commodity prices have fallen substantially, reflecting new headwinds to global manufacturing and broader industrial activity. With re-emerging pressures in core inflation globally, the pace of global disinflation has slowed, while survey-based inflation expectations in key countries have risen alongside tariff-related developments. Trade policy shifts and the associated increase in uncertainty weighed substantially on financial markets earlier this year, although risk appetite has largely recovered in recent weeks.

(Source: <https://openknowledge.worldbank.org/server/api/core/bitstreams/0e685254-776a-40cf-b0ac-f329dd182e9b/content>)

India Macroeconomic Analysis

India's economy showed resilience with GDP growing at 8.2% in CY 2023. The GDP growth in CY 2023 represents a return to pre pandemic era growth path. Even amidst geopolitical uncertainties, particularly those affecting global energy and commodity markets, India continues to remain one of the fastest growing economies in the world.

Country	Real GDP Growth (CY 2023)	Projected GDP Growth (CY 2024)	Projected GDP Growth (CY 2025)
India	8.20%	7.00%	6.50%
China	5.20%	5.00%	4.50%
Russia	3.60%	3.20%	1.50%
Brazil	2.90%	2.10%	2.40%
United States	2.50%	2.60%	1.90%
Japan	1.90%	0.70%	1.00%
Canada	1.20%	1.30%	2.40%
Italy	0.90%	0.70%	0.90%
France	1.10%	0.90%	1.30%
South Africa	0.70%	0.90%	1.20%
United Kingdom	0.10%	0.70%	1.50%
Germany	-0.20%	0.20%	1.30%

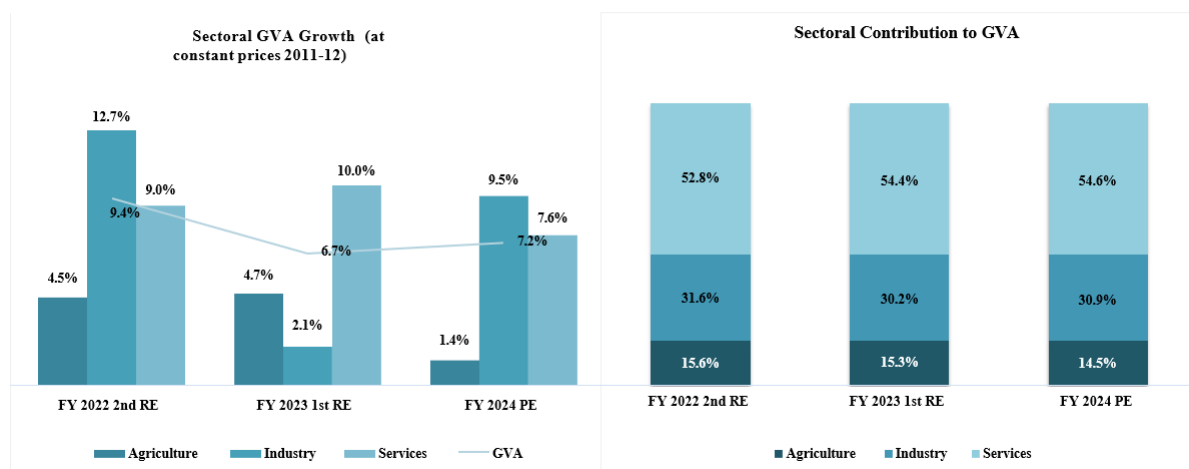
Source: *World Economic Outlook, July 2024*

Countries considered include - Largest Developed Economies and BRICS (*Brazil, Russia, India, China, and South Countries* have been arranged in descending order of GDP growth in 2023).

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

Realizing the need to impart external stimuli, the Government stepped up its spending on infrastructure projects which in turn had a positive impact on economic growth. The capital expenditure of the central government increased by 37.4% increase in capital expenditure (budget estimates), to the tune of INR 10 trillion in the Union Budget 2023-2024. The announcement also included a 30% increase in financial assistance to states at INR 1.3 trillion for capex. The improvement was accentuated further as the Budget 2024-2025 announced an 11.1% increase in the capital expenditure outlay at INR 11.1 trillion, constituting 3.4% of the GDP. This has provided much-needed confidence to the private sector, and in turn, attracted private investment.

Sectoral Contribution to GVA and annual growth trend



Source: Ministry of Statistics & Programme Implementation (MOSPI)

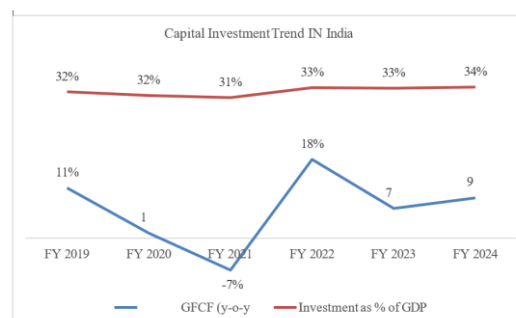
Sectoral analysis of GVA reveals industrial sector recovered sharply registering 9.5% y-o-y increase in FY 2024 against 2.1% in the previous fiscal. In the industrial sector, growth across major economic activity such as mining, manufacturing and construction sector rose significantly and it registered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

Talking about the services sector's performance, with major relaxation in covid restriction, progress on COVID- 19 vaccination and living with virus attitude, business in the service sector gradually returned to normalcy in FY 2023.

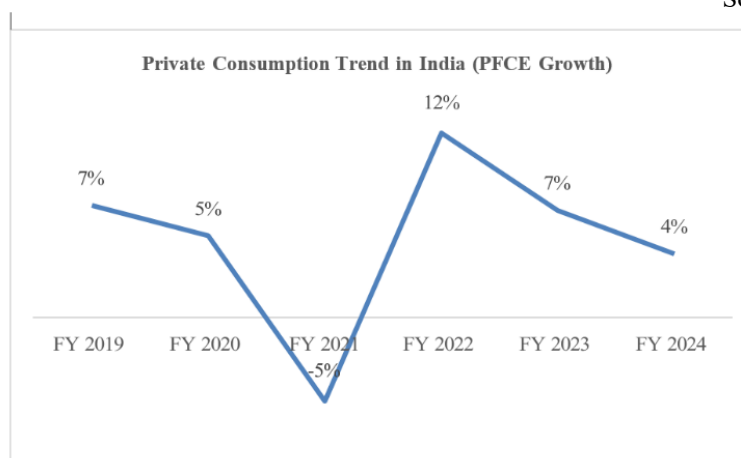
Economic recovery was supported by the service sector as individual mobility returned to the pre- pandemic level. The trade, hotel, transport, communication, and broadcasting segment continued to strengthen in FY 2023 and grow in FY 2024, although the growth hasn't shown substantial increases. In FY 2024, services sector grew by 7.6% against 10% y-o-y growth in the previous year.

Investment & Consumption Scenario

Other major indicators such as Gross fixed capital formation (GFCF), a measure of investments, gained strength during FY 2024 as it grew by 9% on a y-o-y basis against 7% yearly growth in the previous fiscal, while GFCF to GDP ratio measured an all-time high settled higher at 34%.



Source: MOSPI

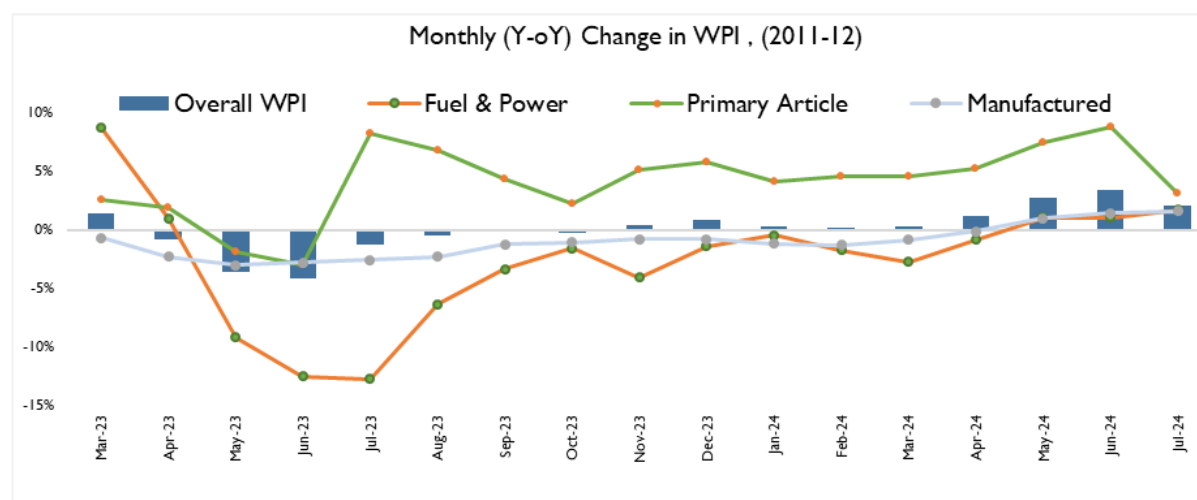


Source: MOSPI

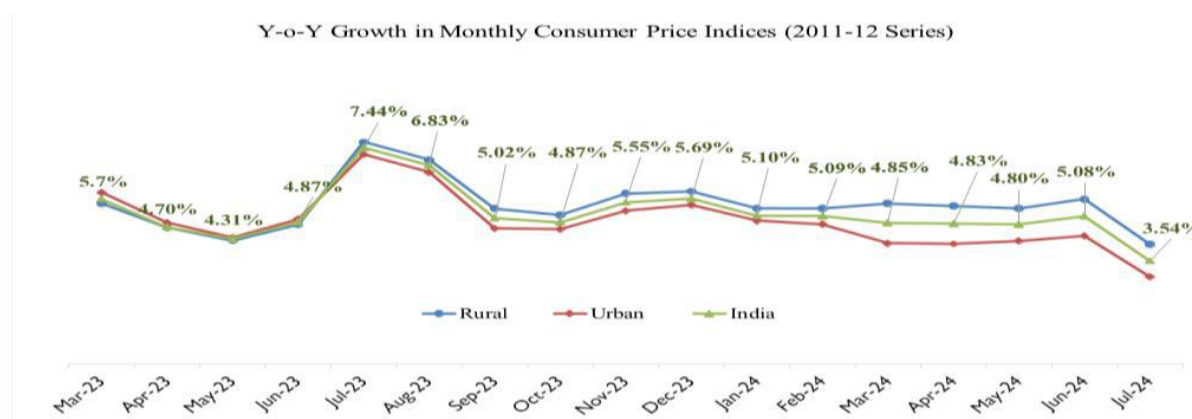
Private Final Expenditure (PFCE) a realistic proxy to gauge household spending, observed decelerated and registered 4% y-o-y growth in FY 2024 against 7% in FY 2023.

Inflation Scenario

The inflation rate based on India's Wholesale Price Index (WPI) exhibited significant fluctuations across different sectors from March 2023 to July 2024. Overall WPI saw a sharp decline to -1.2% in July 2023, primarily driven by steep drops in Fuel & Power and Manufactured Products, reflecting reduced global demand and falling input costs. However, a recovery was noted by June 2024, with WPI reaching 3.4%, supported by a strong rise in Primary Articles and a rebound in Fuel & Power prices. By July 2024, while Primary Articles growth moderated to 3.1%, the WPI remained positive at 2.0%, indicating stabilization in the market after earlier volatility.



Source: MOSPI, Office of Economic Advisor.



Source: CMIE Economic Outlook

GDP Growth Scenario

INDIAN OUTLOOK

India has consistently demonstrated robust economic growth, emerging as one of the fastest-growing major economies globally. India is now the world's fourth-largest economy and is projected to become the third largest by 2030 with a GDP of US\$ 7.3 trillion. This transformation stems from a decade of focused governance, structural reforms, and strengthened global positioning. Backed by strong domestic demand, favourable demographics, and sustained policy reforms, India continues to enhance its global footprint in trade, investment, and innovation. Over the past decade, India's GDP at current prices has surged from US\$ 1.23 trillion in FY15 to an estimated US\$ 3.82 trillion in FY25, tripling in just ten years. In FY25, India's nominal GDP grew by 9.9% and real GDP by 6.5%, with quarterly GDP growth in Q4 FY25 at 7.4%, and a projected real GDP growth range of 6.4% to 6.7% expected in FY26, indicating sustained economic momentum. This trajectory is underpinned by macroeconomic stability, a resilient external sector, narrowing fiscal deficit, easing inflation, and high consumption expenditure. Additionally, improving employment prospects and the government's focus on long-term structural reforms are expected to play a key role in sustaining growth.

Moreover, export performance has experienced remarkable growth over the past decade, reflecting the increasing credibility and demand for Indian products in the global marketplace. India's total exports have shown remarkable growth over the past decade, rising from US\$ 468 billion in FY14 to US\$ 825 billion in FY25, marking a substantial increase of approximately 76%. Additionally, India's share of world merchandise exports also improved, rising from 1.66% to 1.81%, advancing the country from 20th to 17th position globally. The demographic transition, marked by a lower infant mortality rate and a consistent growth in literacy rates, further enhances India's advantageous position. With improved income distribution, heightened employment rates, and globally competitive social amenity provisions, there is potential for India's per capita GDP to expand in the next 25 years, mirroring the growth seen in the preceding 75 years.

In the Union Budget 2025-26, the government proposed to increase allocation for capital expenditure to Rs. 11.21 lakh crore (US\$ 129.0 billion), up 10.1% from revised budget estimate of Rs. 10.18 lakh crore (US\$ 117.2 billion) in FY25.

In FY25, the following key indicators highlighted improved performances:

- Private Final Consumption Expenditure (PFCE) is projected to grow by 7.2% in FY25 over the growth rate of 5.6% in FY24.
- According to the third advance estimates, India's foodgrain production in FY25 is projected at 3,539.59 LMT, marking an increase of 216.61 LMT over FY24's output of 3,322.98 LMT, an approximate growth of 6.5%.
- Consumer Price Index (CPI): Combined inflation was 1.55% in July 2025 against 3.60% in July 2024.
- Services PMI increased to 65.2 in August 2025 as compared to 61.1 in July 2025.
- The consumption of petroleum products during FY26 (April-July 2025) stood at 81.080 MMT in volume terms.
- Quick Estimates for India's Index of Industrial Production (IIP) for June 2025 stood at 153.3 against 151.0 in June 2024.
- The combined index of eight core industries stood at 166.7 for FY26 (April-July) compared to 164.1 for FY25 (April-July). For the month of July 2025, the combined index of eight core industries stood at 166.1.
- Cargo traffic handled at major ports stood at 292.91 million tonnes (MMT) during FY26 (April-July).
- Railway freight traffic stood at 1.6 billion tonnes during FY25, making it the third largest freight handling railway system in the world.
- In July 2025, the number of e-way bills reached a record high of 104.86 million, marking a 19.2% increase YoY and a 4.7% rise sequentially, representing a nine-month high for annual growth.
- The gross GST (Goods and Services Tax) revenue collection stood at Rs. 1,95,735 crore (US\$ 22.39 billion) in July 2025.
- As of August 25, 2025, the Indian basket of crude oil stood at US\$ 69.03 a barrel, increasing from June 2025, which was US\$ 70.38.
- In August 2025, UPI volume stood at 13,775.68 million transactions worth Rs. 17,51,820 crore (US\$ 200.39 billion).
- India's merchandise exports in July 2025 were estimated at US\$ 37.24 billion.
- Merchandise imports in July 2025 were estimated at US\$ 64.59 billion.
- The average daily net injection under the liquidity adjustment facility (LAF) stood at Rs. 1,20,280 crore (US\$ 13.76 billion) as on August 17, 2025.
- In FY26, as on August 15, 2025, foreign exchange reserves in India stood at Rs. 60,86,782 crore (US\$ 696.27 billion).
- As of August 08, 2025, the currency in circulation (CIC) registered Rs. 37,77,781 crore (US\$ 432.14 billion).
- Rupee strength reached Rs. 87.41/US\$ as of August 25, 2025.
- The total foreign direct investment (FDI) equity inflow received by India in FY25 (January-March 2025) amounted to US\$ 17.47 billion.
- According to RBI:
 - Bank credit stood at Rs. 1,86,06,042 crore (US\$ 2.13 trillion) as of August 08, 2025.
 - Credit to non-food industries stood at Rs. 1,85,53,760 crore (US\$ 2.12 trillion) as of August 08, 2025.

India's retail inflation in July 2025 eased to an eight-year low of 1.55%, down from 2.1% in June, marking the lowest since June 2017. Food inflation entered deflation at -1.76%, with rural and urban areas recording 1.18% and 2.05% inflation, respectively. Inflation is expected to rise slightly to around 2.0% in August 2025, with the projected average for FY26 average between 3.0-3.2%. India's job market strengthened in July 2025, with unemployment falling to 5.2% from 5.6% in June, driven by strong rural hiring pre-festival season. Urban unemployment slightly rose to 7.2%. White-collar job listings grew 7% YoY in July 2025, led by hospitality (26%), insurance (22%), education (16%), and oil & gas (13%) sectors. Fresher hiring rose 8%, and professionals with 16+ years' experience saw a 13% rise. Startups and unicorns recorded double-digit hiring growth.

During H1 2025, private equity (PE) and venture capital (VC) investments stood at US\$ 26.4 billion across 593 deals. According to the Economic Survey 2024-25, from July to November 2024, the government's capital expenditure increased by 8.2%, with the defence, railways, and road transport sectors collectively representing 75% of the total capital outlay. In addition, steady growth momentum in service activity continues with healthy PMI levels from October 2024 to July 2025, attributing to the growth in output and accommodating demand conditions, leading to a sustained upturn in sales. The growth

impetus in rail freight and port traffic remains upbeat, with further improvement in the domestic aviation sector. Strong growth in fuel demand, domestic vehicle sales, and high UPI transactions also reflect healthy demand conditions.

The narrowing merchandise trade deficit and the upward trajectory of net services receipts are anticipated to contribute to an enhancement in India's current account deficit.

The Union Budget 2025-26, themed "Sabka Vikas," focuses on balanced growth across regions. It prioritizes agriculture, MSMEs, investment, and exports as key growth engines. Initiatives include the Prime Minister Dhan-Dhaanya Krishi Yojana for agriculture, support for first-time entrepreneurs, and a push for domestic manufacturing through customs duty rationalization. The budget also emphasises education, healthcare, and infrastructure development, with plans for 50,000 Atal Tinkering Labs and new medical colleges.

In the near future, India's banking and financial sector is expected to thrive. Despite foreign investors booking profits in the capital market, the outlook remains largely positive for the country. As global conditions stabilise, foreign investors are expected to re-enter the market and capture the upcoming growth wave. The collective efforts invested over the past several years have laid a robust foundation, providing a sturdy platform upon which the framework of a middle-income economy can be built.

(Source: <https://www.ibef.org/economy/monthly-economic-report>)

INDUSTRY SCENARIO

An Overview: Polymers and Petrochemical industry

Petrochemicals are a vast and essential group of chemicals derived from petroleum (crude oil) and natural gas. These "fossil fuels" are primarily composed of hydrocarbons, molecules containing just hydrogen and carbon atoms. Through various refining and processing techniques, these hydrocarbons are transformed into a diverse range of petrochemical products that underpin countless aspects of human life.

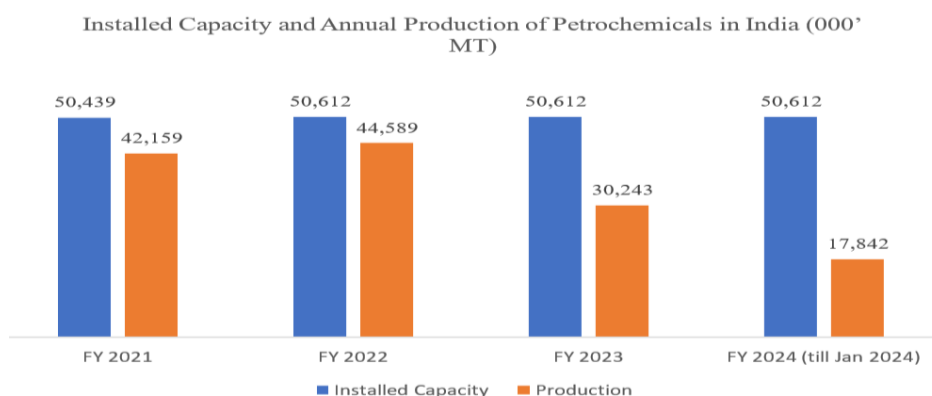
Indian chemical sector continues to grow at a rate of 1.2-1.5 times the GDP. India's chemical and petrochemical industry is currently valued at around USD 178 billion and is expected to reach USD 300 billion by 2025. The Ministry of Petroleum estimates that demand for petrochemicals will triple by 2040, reaching a value of USD 1 trillion. India ranks as the sixth largest player in the global petrochemical market. The industry boasts a strong production base with three gas-based and three naphtha-based cracker complexes for producing key products like ethylene and xylene. Petrochemical products are the essential building blocks for a vast array of downstream industries in India and impact them significantly:

- **Textiles:** Petrochemical-derived fibers like polyester and nylon are cost-effective, durable, and versatile, revolutionizing the textile industry. They are used in clothing, furnishings, and industrial applications.
- **Construction:** Petrochemicals play a crucial role in construction materials. PVC pipes are lightweight, corrosion resistant, and used in plumbing and drainage. Polyurethanes provide insulation for buildings, and epoxies are used in adhesives and coatings.
- **Packaging:** Plastics dominate the packaging industry due to their affordability, lightweight nature, and ability to protect contents. Flexible films, bottles, and containers made from polyethylene, polypropylene, and PET are ubiquitous.
- **Pharmaceuticals:** The industry relies on various petrochemical products for packaging (blister packs, vials), medical devices (syringes, catheters), and even drug delivery systems.
- **Agriculture:** Petrochemicals play a vital role in agricultural development. Fertilizers derived from petrochemicals improve crop yields. Additionally, plastic films for greenhouses, irrigation pipes, and weed control fabrics contribute significantly.

As living standards improve, the demand for consumer goods like packaged food, clothing, electronics, and automobiles rises, all of which rely heavily on petrochemical products. The rapid growth of urban areas creates a demand for better infrastructure, housing, and sanitation, all of which involve the use of petrochemicals in construction and waste management. With a growing population, the demand for healthcare products and pharmaceuticals increases, leading to a higher requirement for petrochemical-based packaging and medical devices.

Production Scenario

Annual production of basic petrochemicals in India is estimated to be 17.8 million metric tons in FY 2023 (till January 2024) while production is estimated to be nearly 44.6 million metric tons in FY 2022. Between FY 2020 and 2022, the production of petrochemicals has increased by a CAGR of 1.2%.



Source: Department of Chemicals and Petrochemicals, D&B estimates

Note: Installed capacity figures for FY 2022, FY 2023, and FY 2024 are held constant due to the absence of official data releases from the Department of Chemicals and Petrochemicals for FY 2023 and FY 2024.

Production

Production levels haven't kept pace with the increase in installed capacity. They show a decline from 43,524.13 thousand MT in FY 2020 to 42,159.38 thousand MT in FY 2021, followed by a partial recovery to 44,588.52 thousand MT in FY 2022, which further declined to 30,243 thousand MT in FY 2023.

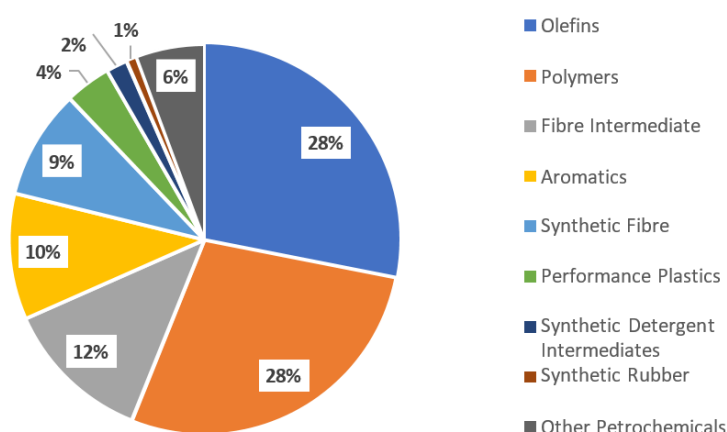
Key product segments in Petrochemicals

Olefins & Polymers segments together, with a combined contribution of 56%, represent the backbone of the Indian petrochemical industry. Olefins, like ethylene and propylene, are the fundamental building blocks for various polymers, including polyethylene (PE), polypropylene (PP), and PVC. These polymers are widely used in packaging, construction, textiles, and numerous other applications.

Fibre Intermediates (12%) & Synthetic Fibres (9%) together, these segments account for 21%, highlighting the importance of polyester and other synthetic fibers in the Indian textile industry. These fibers offer affordability, durability, and versatility, making them popular choices for clothing, home textiles, and industrial applications.

Aromatics accounts for 10% of the production in FY 2023, this segment encompasses benzene, toluene, and xylene, used in various applications like plastics, synthetic rubber, and solvents. Whereas Performance Plastics contributes 4%, these specialized plastics offer superior properties like high heat resistance, chemical resistance, and flame retardancy, finding applications in electronics, automotive parts, and aerospace. Synthetic Detergent Intermediates (2%) & Synthetic Rubber (1%), these segments cater to specific needs in the cleaning products and automotive industries, respectively. Other Petrochemicals accounts for 6%, this category encompasses a diverse range of chemicals used in various sectors like pharmaceuticals, paints, and adhesives.

Petrochemical Production Pattern - Key Segments

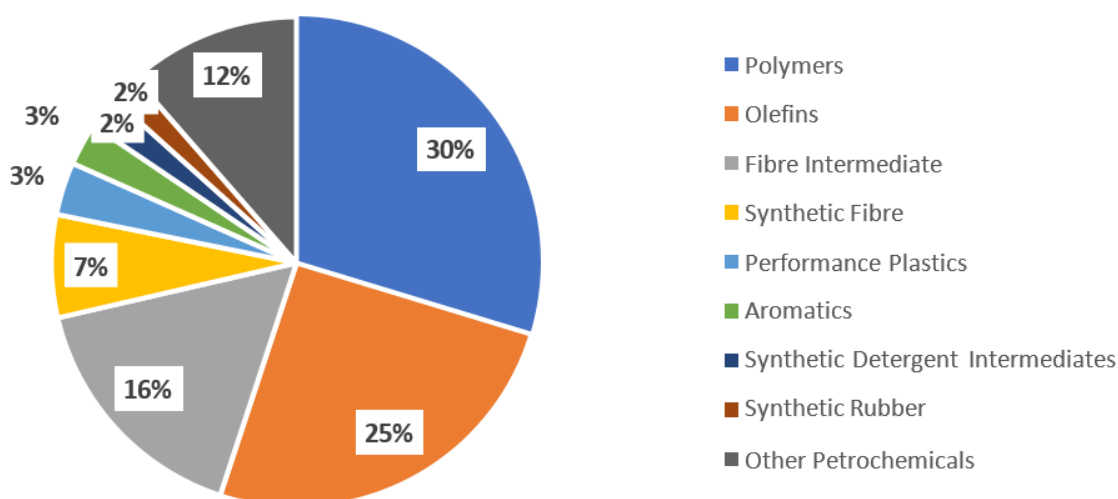


Key product segments in Polymers

Polymers (30%) and Olefins (25%) form the backbone of petrochemical consumption in India, accounting for over half (55%) of the total consumption. Polymers, including polyethylene, polypropylene, and PVC, are the most widely consumed petrochemicals in India. Their versatility makes them essential for various applications in packaging, construction, textiles,

and consumer durables. Olefins like ethylene and propylene are the building blocks for many polymers. Their high demand reflects the strong consumption of downstream polymer products.

Petrochemical Consumption Pattern - Key Segments



Source: Department of Chemicals and Petrochemicals

Fibre Intermediates and Synthetic Fibres accounts for 16% & 7% respectively, this segment, totalling 23%, signifies a growing market for synthetic textiles. These segments cater to the textile industry, a major consumer of petrochemical based fibers like polyester and nylon. Rising demand for clothing and technical textiles is likely driving growth in this segment.

Performance Plastics and Aromatics each accounts 3% of the total production. Performance plastics offer superior properties like high strength, heat resistance, and flame retardancy. Their applications is increasing in automotive components, electronics, and aerospace segment.

Synthetic Detergent Intermediates and Synthetic Rubber each contributes 2% to the total production. These segments cater to specific applications like detergents and tire production.

Other Petrochemicals accounts for 12% of the production, encompass a diverse range of chemicals used in various applications. It includes products like plasticizers, solvents, adhesives, and specialty chemicals catering to specific industrial needs.

Regulatory framework surrounding petrochemical product import in India Authorities Involved

The import of petrochemical products into India is regulated by several key authorities. The Directorate General of Foreign Trade (DGFT) under the Ministry of Commerce and Industry plays a pivotal role in formulating and implementing import policies. DGFT issues Import Policy notifications, Export Policy, and Control Orders that govern the importation of goods, including petrochemical products. Importers must adhere to these policies and obtain necessary licenses or permissions as per the Import Policy.

Customs authorities oversee the physical movement of goods into the country and enforce tariff classifications and duty payments. They operate under the Central Board of Indirect Taxes and Customs (CBIC), which administers the Customs Tariff Act to determine duties applicable to petrochemical imports. Compliance with customs regulations is essential for proper clearance and entry into India.

The Ministry of Environment, Forest and Climate Change regulates environmental aspects related to the importation and handling of petrochemical products. Importers must comply with environmental norms to ensure the safe storage, handling, and transport of hazardous chemicals, thereby mitigating environmental risks and ensuring public safety.

Standards and Compliance Requirements

Bureau of Indian Standards (BIS) sets forth standards for petrochemical products to ensure quality, safety, and reliability. Compliance with BIS standards is mandatory for imported petrochemicals to ensure they meet Indian regulatory requirements. This includes specifications for product quality, packaging, labeling, and conformity assessment procedures.

Petroleum and Natural Gas Regulatory Board (PNGRB) regulates downstream activities in the petroleum sector, including refining and distribution. While primarily focused on petroleum products, its regulations may also impact certain petrochemical imports, especially those closely related to the petroleum industry.

Taxation and Duties

Currently, the customs duties on these products are approximately 7.5%. Imported petrochemical products are subject to multiple taxes and duties. The Goods and Services Tax (GST) applies to the value of imported goods, while Customs Duties—including Basic Customs Duty (BCD), Countervailing Duty (CVD), and Special Additional Duty (SAD)—are imposed based on the classification and value of the products. Importers must accurately declare the value and classification of their goods to ensure correct assessment and payment of these duties.

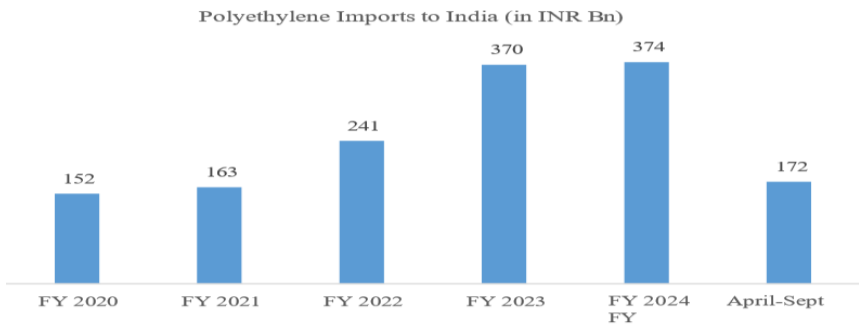
Trade Agreements and Preferences

India participates in several bilateral and multilateral trade agreements that may offer preferential tariff rates or exemptions for certain petrochemical products. Importers can benefit from these agreements by meeting specific rules of origin and compliance criteria outlined in each agreement. Leveraging these agreements can reduce import costs and facilitate smoother trade relations with partner countries.

Trade Analysis

Import & Export of Polyethylene

India is a net importer of polyethylene with value of annual imports touching INR 374 Bn in FY 2024 against an annual export value of approximately INR 43 Bn in the same year. Strong imports of polyethylene is on account of a combination of insufficient domestic production as well as competitive cost of imported products as against domestic supply.



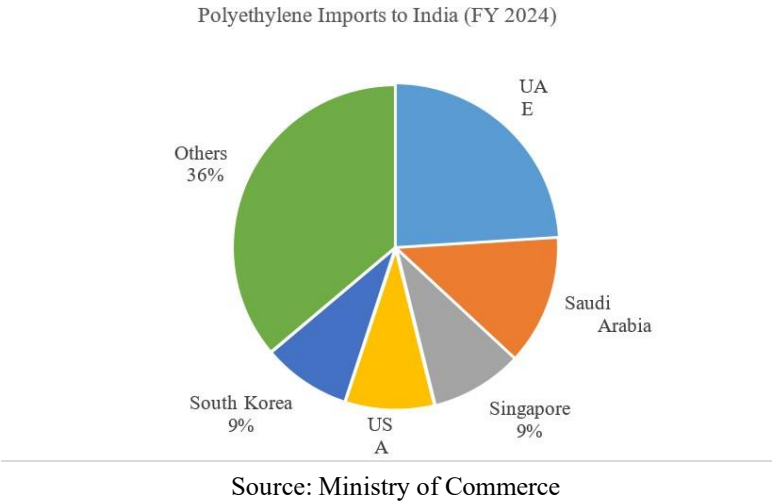
Source: Ministry of Commerce

Commodity (in INR Billion)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Apr - Sep FY 2025
Polyethylene with gravity of <0.94	28	21	27	33	31	23
Polyethylene with gravity of 0.94 or More	41	48	63	140	164	64
Linear Low-Density Polyethylene	-	9	15	21	21	13
Linear Low-Density Polyethylene	22	15	21	44	36	12
Low Density Polyethylene	-	14	27	24	29	23

India's import trends for polyethylene highlight varying patterns across categories, driven by domestic demand and application-specific requirements. Polyethylene with a specific gravity of less than 0.94 saw fluctuations, declining from INR 28 billion in FY 2020 to INR 21 billion in FY 2021, rebounding to INR 33 billion in FY 2023, and then moderating to INR 23 billion during April–September FY 2025, possibly due to increasing domestic supply or reduced demand. In contrast, imports of polyethylene with a specific gravity of 0.94 or more surged from INR 41 billion in FY 2020 to INR 164 billion in FY 2024, reflecting robust demand for high-strength applications, though FY 2025 imports (April– September) showed signs of moderation at INR 64 billion. Linear low-density polyethylene (LLDPE) imports varied across sub-categories, with one segment growing from INR 9 billion in FY 2021 to INR 21 billion in FY 2024, while another peaked at INR 44 billion in FY 2023 before declining to INR 12 billion in FY 2025. Low-density polyethylene (LDPE) imports have steadily risen, from INR 14 billion in FY 2021 to INR 29 billion in FY 2024, maintaining strong demand at INR 23 billion during the first half of FY 2025, driven by its extensive use in packaging and films. These trends underscore the growing reliance on imports for

high-gravity polyethylene and LDPE, while lower-gravity polyethylene and some LLDPE segments show signs of reduced import dependency or shifting market dynamics.

Approximately 64% of the total value of polyethylene imported to India comes from five countries – namely UAE, Saudi Arabia, Singapore, USA and South Korea. Of this, UAE is the largest exporter of polyethylene to India, accounting for nearly one fourth of the total value of polyethylene imports to India in FY 2024.



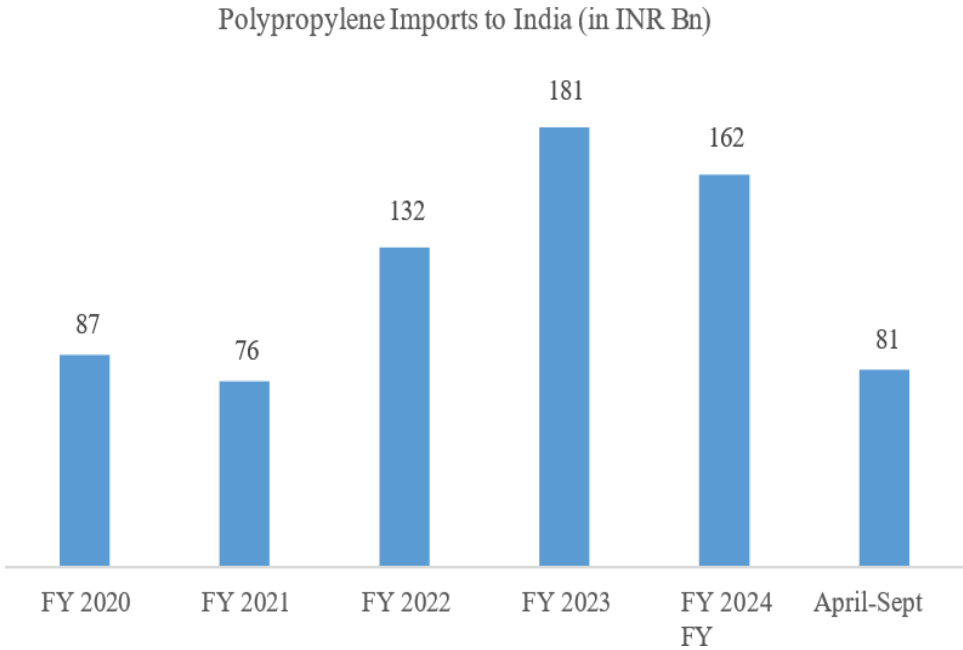
Meanwhile, annual export of polyethylene from India is estimated to be nearly INR 43 Bn in FY 2024. The value of polyethylene imported to India has been declining steadily, falling from INR 66.4 Bn in FY 2020 to the current value of INR 43 Bn. Domestic production capacity of polyethylene have improved over the years, however the rising domestic demand is expected to have slowed down exports.

China was the largest export market for Indian PE industry in FY 2024. Approximately one fourth of total value of PE exports in FY 2024 came from exports to China. Other notable export destinations include Nepal, Vietnam, Egypt and Bangladesh.

Import & Export of Polypropylene

Just like polyethylene, India is also a net importer of polypropylene. Annual value of polypropylene imported to India reached INR 162 Bn in FY 2024, as against an annual export value of INR 35 Bn in the same year.

During the time period FY 2020 – 24, the annual import value of polypropylene has almost doubled, increasing from INR 87 Bn in FY 2020 to the current value of INR 162 Bn (in FY 2024). This translates into a CAGR of nearly 17% during the time period. During the first six months of FY 2025 (April – September), the value of PP imports reached INR 81 Bn.



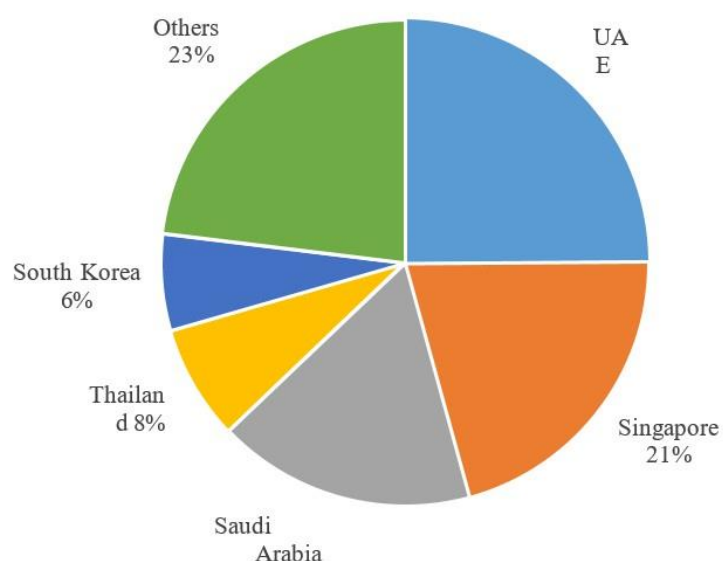
Source: Ministry of Commerce

Commodity (in INR Billion)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Apr - Sep FY 2025
Polypropylene	56	48	85	125	106	59
Polypropylene Copolymers	24	22	37	44	44	29

India's imports of polypropylene and its copolymers have demonstrated distinct patterns in recent years, reflecting changes in industrial demand. Polypropylene imports increased from INR 56 billion in FY 2020 to INR 85 billion in FY 2022, followed by a rise to INR 125 billion in FY 2023. Subsequently, imports declined to INR 106 billion in FY 2024 and recorded INR 59 billion during the first half of FY 2025. Polypropylene copolymers showed consistent growth, with imports increasing from INR 24 billion in FY 2020 to INR 37 billion in FY 2022 and remaining stable at INR 44 billion in both FY 2023 and FY 2024. During April–September FY 2025, imports were reported at INR 29 billion, indicating steady demand from key sectors such as automotive, packaging, and consumer goods. There has been stable growth in the polypropylene copolymer segment, while polypropylene imports reflect fluctuations influenced by market conditions and production capabilities.

Bulk of India's import of polyethylene comes from UAE, Singapore, Saudi Arabia, South Korea and Thailand. These are the same countries who are the major exporters of polyethylene to India. In FY 2024, UAE the largest exporter of polypropylene to India accounted for nearly 24% of the total value of PP imports to India during the year.

Polypropylene Imports to India (FY 2024)



Source: Ministry of Commerce

On the other hand, the overall export of polypropylene from India in FY 2024 yielded an export revenue of approximately INR 34.6 Bn. PP exports from India has been steadily declining for the past couple of years, falling from INR 57 Bn in FY 2021 to the current level.

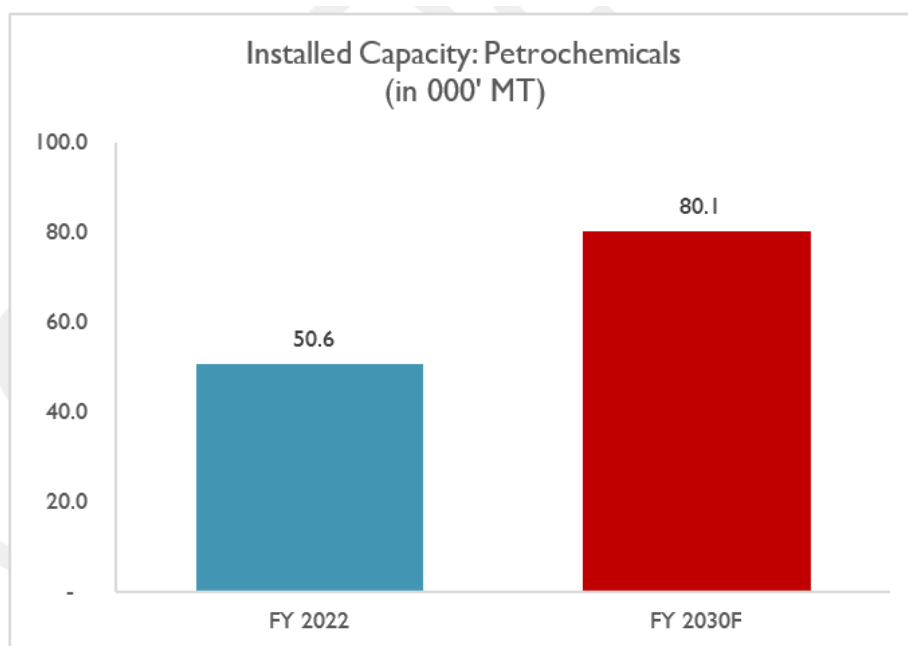
Growth Forecast

While the historical performance of Indian chemical industry has been exemplary, the future holds even better growth opportunities. Domestic chemical consumption is rising steadily, and the country is expected to account for more than 20% of the incremental global consumption of chemicals that would happen globally in near future. The steady growth in industrial production is a key demand enabler.

In addition, India is also positioning itself as a global chemical manufacturing hub, to meet the growing global demand. The evolving geopolitical scenario (the impact of events like Covid-19 pandemic and Russia – Ukraine conflict on global supply chain) has raised the question to relook the existing manufacturing landscape. Developed economies are looking at options beyond China to source products. This geopolitical scenario is expected to benefit India, which already has a very strong chemical manufacturing infrastructure.

The strong domestic demand, and the ascendance of India as a global chemical manufacturing hub are expected to accelerate the growth in chemical & petrochemical production in India. By the end of this decade, the annual production of petrochemicals is expected to reach nearly 70.6 thousand MT

The petrochemical industry will have to gear up to meet the expected demand that would materialize over the course of this decade. For that to happen, the industry will have to massively upgrade its installed production capacity. At present, India has the capability to produce nearly 51 million tons of petrochemicals per annum. To support the anticipated growth in demand & production, India will have to scale up its installed petrochemical production capability to 80 mtpa by FY2030.



Source: Ministry of Chemicals. D&B Estimates

The above scenario envisages an addition of nearly 29.5 million tons of additional capacity in chemical and manufacturing space within the next six to seven years (FY 2023-30 period). The capex cycle in chemical manufacturing for this decade would be focused primarily on building up that capacity.

Competitive Landscape

The Indian polymer trading industry is a dynamic and complex, shaped by a mix of domestic leaders and international players. A key driver of competition is integration, as companies aim to manage the entire value chain, from raw material sourcing and production to distribution and marketing. This integrated approach enhances cost control and product quality. Access to resources also plays a pivotal role in defining competitive advantage, with firms having secure supplies of petrochemical feedstocks or partnerships with resource- abundant nations standing out.

The industry is broadly divided into two segments: upstream (production of polymers and feedstocks) and downstream (distribution, trading, and end-user applications). In the upstream segment, public sector undertakings (PSUs) like Indian

Oil Corporation (IOC) and GAIL dominate, contributing significantly to India's polymer production. Meanwhile, the downstream trading sector sees a more diverse set of participants. Here, IOC continues to leverage its extensive distribution network, while private enterprises like Reliance Industries Limited (RIL) also hold a significant position supported by their robust manufacturing capacities. Global players such as BASF and Dow are also increasingly active in the market, offering specialized products and expanding their footprint in India.

This combination of established PSUs, agile private firms, and influential multinational corporations fosters a competitive environment where innovation, efficiency, and market responsiveness are critical for success.

Overview: Lithium Ion (*Li-ion*) and Sodium (*Na-ion*) Battery

Storage battery or rechargeable battery is a type of electrical battery comprising one or more electrochemical cells enabling electrochemical reactions which are electrically reversible. Some of the popular and commercial battery chemistry that are used world over include lead-acid, nickel metal hydride (NiMH), nickel cadmium (NiCad), lithium ion (Li-ion), and lithium-ion polymer (Li-ion polymer). These storage batteries have higher initial cost than disposable battery but can be recharged and used many times. These batteries find wide application in motor vehicles as well as back-up power supply units.

Amongst all, Lead acid batteries are one of the oldest rechargeable batteries with more than 150 years of existence. With a proven arrangement for reliable and low-cost energy storage, lead-acid batteries play an important role in our day-to-day life and still hold a substantial share in the overall battery market. Lead acid battery demand is broadly segmented into two - automotive batteries and industrial batteries. Automotive batteries (including batteries sold to OEMs and replacement batteries) form the largest component, accounting for close to 50% of total battery sale. Industrial batteries can be further divided into three: conventional flooded lead battery, valve regulated lead acid (VRLA) battery and nickel cadmium battery.

In industrial segment, it finds application in a wide range of industries such as Telecom, Railways, Power Control, Solar and UPS, amongst other. Also, the industry has been witnessing significant technological advancements to push its deployment in new and emerging application segments such as EV and energy storage application. Although, the lithium-ion batteries have built a remarkable presence in EVs and grid scale storage applications, but lead-acid batteries continue to stay ahead in terms of production costs, adoption.

In India, lead acid batteries hold a dominant position which can be attributed primarily to the cost advantage of lead acid batteries. The domestic capability to manufacture lead acid batteries, including sealed lead acid ones, is well established, with numerous players in the sector. This has resulted in low production costs due to easy access to raw materials, labor, and utilities, making these batteries available at a lower cost.

Lithium-ion battery

A lithium-ion battery or Li-ion battery (LIB) is a type of rechargeable battery. These are widely used in portable electronics, PDAs, iPods, cell phones, laptops, electronic toys etc. and are growing in popularity for its application in electric vehicle and energy storage application in solar energy. In many applications, the industry is witnessing a shift from conventional batteries to lithium-ion batteries because of their customizable property where in the number of cells in the battery can be adjusted based on the energy requirement. Structurally, EV battery is different from the Li-ion battery used in portable electronic batteries used in tablets, phones, and laptops. The EV battery contains a series of small cells grouped in a module. Several modules are then tightly assembled to make a traction battery pack.

Lithium is the also lightest solid element and possesses the highest oxidation potential. Li-On battery have higher energy density compared to the standard lead acid and NiMH batteries, which make it a preferred material for EV. Furthermore, longevity of Li-ion battery and its reducing cost are another major reason for this shift. As per industry estimates, Lead acid batteries that cost around INR 7,000 last only but a lithium-ion battery that costs INR 30,000. Currently, batteries account for almost 40-50% of the cost of an electric vehicle.

Sodium-ion Battery

Sodium-ion (Na-ion) batteries are an emerging class of rechargeable energy storage systems that utilize sodium ions as charge carriers instead of lithium. These batteries function on principles similar to lithium-ion cells but employ sodium, an element that is significantly more abundant and cost-effective than lithium. Due to these material advantages, sodium-ion technology has gained strong interest as a potential alternative for applications where cost, safety, and resource sustainability are critical considerations.

Sodium-ion batteries offer several advantages, including good thermal stability, operational safety, faster charging potential, and superior performance in low-temperature environments. Although their energy density is currently lower than advanced lithium-ion chemistries, they are particularly suitable for stationary energy storage systems, renewable integration, and cost-sensitive electric mobility segments such as low-speed electric vehicles and two- or three-wheelers. Ongoing research and pilot-scale production efforts are improving cycle life, energy efficiency, and scalability.

Li-On Batteries Structure

Lithium-Ion battery is made of one or more power generating compartments called cells where each cell essentially comprises of three components. -positive electrode, negative electrode, and electrolyte. A positive electrode connects to the battery's positive terminal, a negative electrode connects to the negative terminal and chemical called an electrolyte is in between them. Lithium-ion batteries comprise a family of battery chemistries that employ various combinations of anode and cathode materials.

Lithium-ion batteries are often clubbed together with group of batteries that contain lithium, but their chemical composition may differ widely and so do their performance. Li-ion battery uses an intercalated lithium compound as one electrode material, compared to the metallic lithium used in a non-rechargeable lithium battery. In the Li-ion batteries, lithium ions move from the negative electrode (anode) to the positive electrode (cathode) during discharge and vice-versa when charging.

In lithium batteries, cathode materials largely include minerals such as aluminium, cobalt, lithium, manganese, and nickel, with anode made up of graphite. The positive electrode is typically made from a chemical compound called Lithium-cobalt oxide (LiCoO₂) or Lithium Iron phosphate (LiFePO₄). The negative electrode is generally made from carbon(graphite).

Following are major advantages and disadvantage of Li-ion Battery.

Advantages

- Amongst all the rechargeable batteries, li-ion battery has highest energy density which typically range 50-260 Wh/kg, compared to 60-120 Wh/kg for a nickel-metal hydride (NiMH) battery, 45-80 Wh/kg for Nickel-cadmium battery and only 30-50 Wh/kg for a lead-acid battery.
- Does not need prolonged priming when new. One regular charge is all that's needed. LIBs hold a charge well.
- They usually lose approximately 5% of their charge each month, against a 20% monthly loss for NiMH batteries.
- Low Maintenance - no periodic discharge is needed; there is no memory.
- LIBs do not require complete discharge prior to recharging.
- LIBs can handle more charge/discharge cycles.
- Lithium is 100% recyclable

Limitations

- Requires protection circuit to maintain voltage and current within safe limits.
- LIBs are highly sensitive to higher temperatures. Higher temperature leads to a much faster degradation rate than normal.
- LIBs start to degrade the moment they leave the factory. Subject to aging, even if not in use - storage in a cool place at 40% charge reduces the aging effect.
- If a LIB is fully discharged, it gets totally damaged.
- There exists a small possibility that if the LIB pack fails, it may burst open into flame.
- Transportation restrictions - shipment of larger quantities may be subject to regulatory control. This restriction does not apply to personal carry-on batteries.
- Expensive to manufacture about 40% higher in cost than nickel-cadmium.

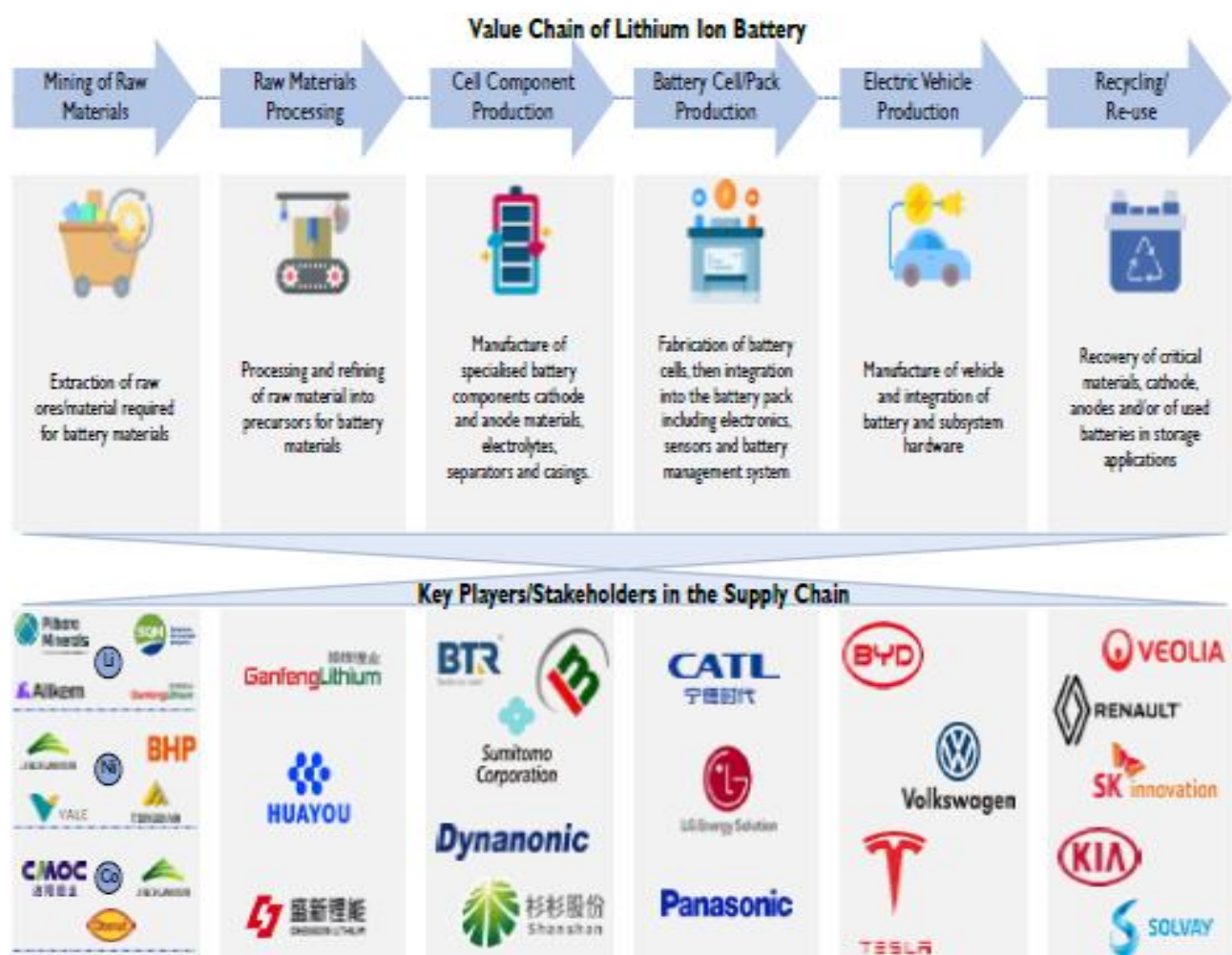
Manufacturers of Li-ion batteries have experimented with the materials used on the cathode & anode as well as varying composition of electrolyte which causes lithium-ion batteries to vary in their energy density levels. Li-ion battery have a high energy density² and low self-discharge. Following are few the most popular lithium-ion battery chemistries, along with their respective energy densities, use cases, benefits, and constraint.

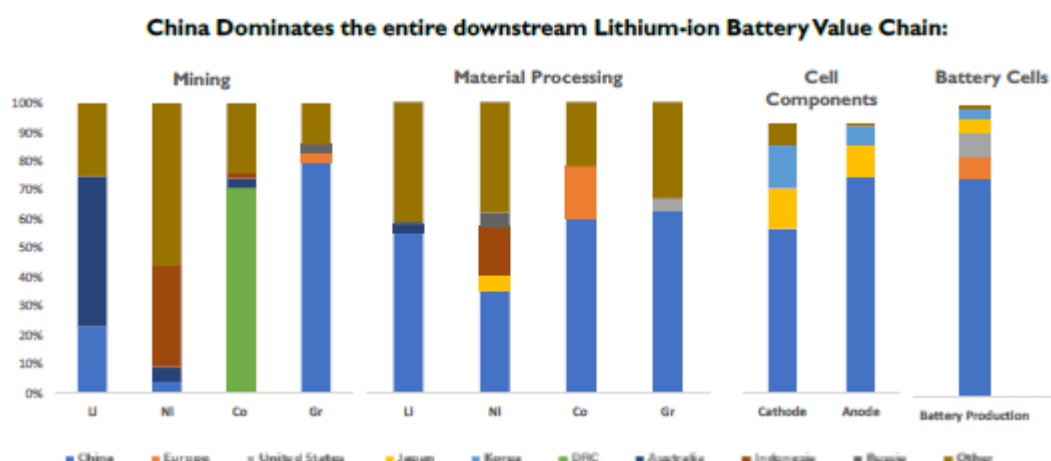
Global Lithium-Ion Battery Industry

Market Scenario

The lithium-ion battery industry is experiencing a remarkable surge, transforming the way humans power their lives. From electric vehicles (EVs) to consumer electronics, these versatile batteries are playing a pivotal role in the clean energy transition. The global lithium-ion battery market has witnessed a significant leap, reaching an estimated USD 64.8 billion in 2023, compared to USD 40 billion in 2019. This translates to a compound annual growth rate (CAGR) of 13%, indicating a steady and consistent expansion. Going forward, the market is projected to soar even further, reaching over USD 146 billion by 2028, with a projected CAGR of 17.6%. This exponential growth trajectory underscores the immense potential of lithium-ion batteries in shaping the future of energy.

Lithium-ion battery supply chains consist of multiple complex stages that are spread around the world. They involve extracting minerals, refining chemicals, synthesizing materials, fabricating cells, and assembling modules. Below graphics explains the Lithium -ion battery supply chain.





Raw Material Availability

In addition to the above, there is a growing concern over the scarcity of raw materials used in Li-ion batteries. The demand for lithium, driven primarily by battery-related applications, is expected to increase significantly in the coming years.

Currently, around 60 percent of lithium production is dedicated to batteries, but this figure could rise to 95 percent by 2030.

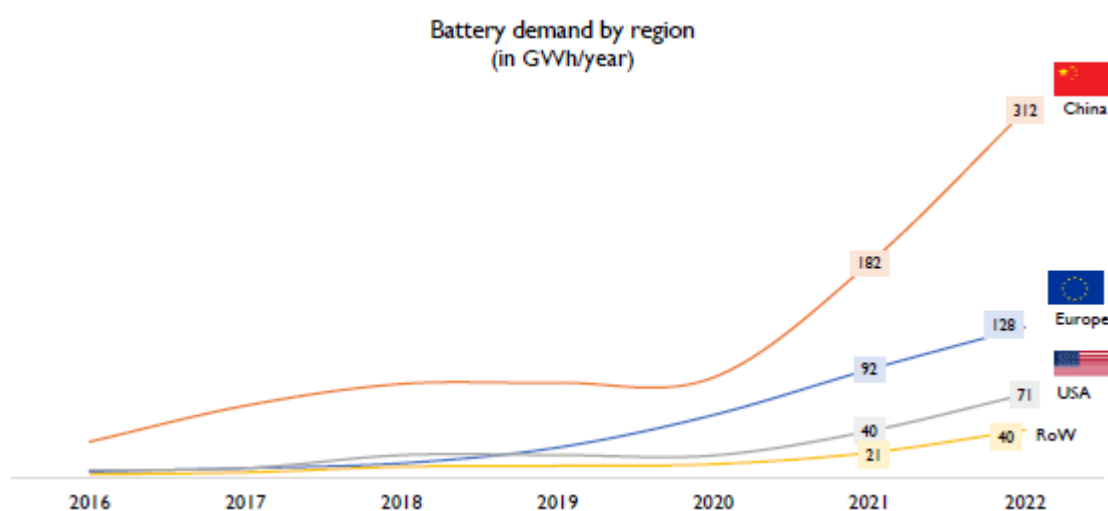
While lithium reserves exist worldwide, high-grade deposits are mainly concentrated in a few countries, including, Argentina, Australia, Chile, and China.

To meet the growing demand for lithium, there will need to be a substantial increase in mining activities. However, it is important to note that lithium mining projects require significant investments and face various challenges, including environmental concerns and local opposition. Additionally, as the technological advancements in battery technology continue to evolve, there may be a need for more lithium-heavy batteries, further increasing the demand for lithium.

Global Outlook for Li-ion Batteries:

The global market for lithium-ion (Li-ion) batteries is experiencing rapid growth, driven by advancements in battery technology, supportive government policies, and increasing awareness of environmental sustainability.

As the demand for energy storage solutions increases across various sectors, understanding regional dynamics in Li-ion battery demand and production becomes crucial for stakeholders in the value chain.



Sources: IEA Report

Notes: ROW stands for Rest of the World

The growth of lithium-ion battery storage capacity in various countries is driven by a combination of factors, reflecting global trends towards electrification, renewable energy adoption, and sustainable development.

Global Market Scenario for Sodium-ion battery

The global sodium-ion battery market is in the early stages of commercialization but is expanding rapidly.

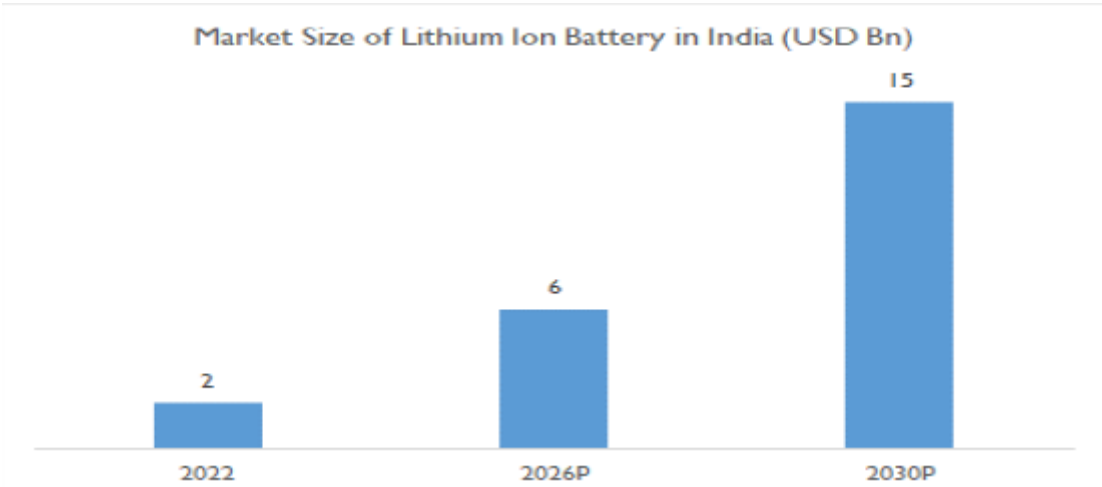
- The global sodium-ion battery market at US\$ 410.4 million in 2025, and projects it reaching about US\$ 1,037.8 million (≈ US\$ 1.04 billion) by 2034. IMARC Group.
- The market was valued at US\$ 1.47 billion in 2024, expected to grow to around US\$ 6.25 billion by 2032, representing a CAGR of ~19.24%.
- Market size about US\$ 0.61 billion in 2024, expected to reach about US\$ 2.19 billion by 2030, CAGR ~23.5%.
- Market value ~US\$ 2.5 billion in 2025, forecast to ~US\$ 11.3 billion by 2035 (CAGR ~16.4%).

Asia-Pacific currently dominates global market share, supported by strong investments in battery manufacturing and government-led renewable energy initiatives in China and India. Europe is also emerging as a significant region owing to policy emphasis on grid-scale storage and sustainable mobility solutions.

Indian Lithium-ion battery Outlook

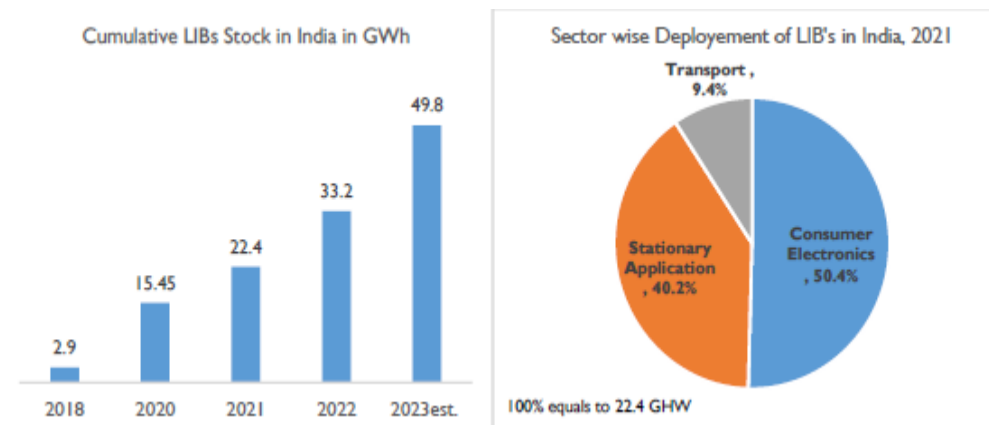
Market Scenario

In value term, the size of the lithium-ion battery in India was estimated at around 2 billion which under (the accelerated scenario) is expected to grow to USD 6 Bn by 2026 and further to USD 15 Bn in 2030, driving by the increasing demand across the major end using vertical.



Source: Nitin Aayog

The lithium-ion industry demand is witnessing healthy demand growth in India backed by rising usage in diversified end user industry. The country’s cumulative lithium-ion battery market in India have grown from 2.9 GWh in 2018 to 22.4 GWh in 2021 and is estimated to have grown further to 49.8 GWh in 2023. Between 2020-23, the market demand is estimated to have grown by 47% CAGR. This expansion is driven by advancements in battery technology, heightened investment in renewable energy infrastructure, and supportive government policies promoting green energy and sustainable transportation. Leading companies in the market are concentrating on increasing production capacity, improving battery efficiency, and ensuring sustainable supply chains to meet the growing demand while addressing environmental and resource-related challenges.



The current deployment of Li-ion batteries (LIBs) in India is predominantly driven by consumer electronics, including smartphones, laptops, notebooks, and tablets. Amongst several consuming sector, consumer electronic account for maximum deployment of 11.3 GWh followed by LIBs deployment

in Stationary Application at 9GWh and transport application at 2.1 GWh translating into respective market share of 50.4%, 40.2% and 9.4%. Increasing consumer electronics adoption and continued development of smart devices backed by growing income has supported the consumption of lithium-ion batteries. This sector is expected to grow further with increased digitalization and technological integration in daily life.

Though consumer electronics have dominated LIBs consumption in India in the past, but the sector has been losing its share to the other two segments. In 2020, consumer electronic accounted for 61% of LIBs deployment while stationary application and EV sector account for 36% share and 3% share, respectively. Since 2016, the market for advanced cells, particularly LIBs, has grown exponentially, primarily due to their increasing usage in grid scale battery-based storage system in RE sector and accelerated EV adoption in India. This trend is expected to continue, transforming the LIBs consumption landscape in India.

KEY CHALLENGES IN INDIAN MARKET

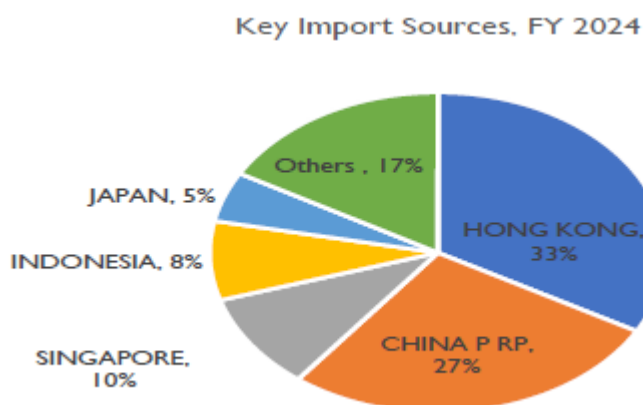
Low mineral reserves: - a major challenge in the Primary Production of Lithium Battery in India

In Li-ion batteries, cathode materials vary, but common formulations include minerals such as lithium, aluminium, cobalt, manganese, and nickel, while the anode is made of graphite. India lacks in reserves of some of the most important Li-ion components including lithium, cobalt, nickel and even in the copper used in conductors, cables, and bus bars.

Lithium presence is largely confined to countries like Chile, Australia, Argentina, China, and United state while Cobalt, another critical material that goes into the manufacturing batteries for electric vehicles, is largely mined in Democratic republic of Congo (DRC), Australia, Cuba and Philippines, and has a very fragile supply chain. Few studies indicate sufficient lithium resources available globally to meet growing requirement, however, reliable supply, availability at affordable prices of raw material and processed functional materials used in the anode and cathode, poses a challenge.

Import dependency: key challenges & initiatives done to lower the dependency.

The country has limited domestic production capacity, relying heavily on imports of lithium -ion cell3 from countries like Hong Kong and China and Singapore.



This reliance exposes India to supply chain disruptions and price volatility. Additionally, the scarcity of raw materials such as lithium, cobalt, and nickel, which are essential for manufacturing lithium-ion cells, further exacerbates the dependency on imports. Establishing a self-sufficient supply chain is complex due to these material shortages. Moreover, the high capital investment required to set up lithium-ion cell manufacturing plants is a significant barrier. The costs associated with technology, infrastructure, and skilled labour deter many potential investors. Technological gaps also pose a challenge; advanced manufacturing technologies and expertise are concentrated in countries with established industries, making it difficult for India to compete and innovate.

On demand side where the Indian Government has set an ambitious target to achieve 30% of new vehicle registrations to be electric and 450GW of renewables (for which nearly 134GWh will be required) by 2030, it becomes critical to have a secure supply to support this vision. Consequently, the government to ensure secure supply has the target of reaching a cell manufacturing capacity of 50GWh by 2030. Thus, it has been taking announcing several measure that will the strengthen the domestic capabilities and reduce the import dependency in the coming years.

Regulatory Landscape

The Indian government has been actively promoting domestic manufacturing of Lithium-ion batteries as part of its efforts to boost the adoption of electric mobility and reduce the country's dependence on imports. Several policies and initiatives have been introduced to incentivize and support the growth of the EV battery manufacturing ecosystem in India. Some of the key government policies are:

National Electric Mobility Mission Plan (NEMMP):

The National Electric Mobility Mission Plan (NEMMP), launched in 2013, is a comprehensive and ambitious initiative aimed at achieving substantial electrification of the Indian automotive sector. The plan focuses on promoting hybrid and electric vehicles (EVs) to enhance national fuel security and reduce the country's dependence on traditional fossil fuels.

A key goal of NEMMP 2020 is to achieve a significant increase in the sales of hybrid and electric vehicles. The government has set an ambitious target of 6-7 million annual sales of such vehicles starting from 2020. To achieve this target, the government plans to provide fiscal and monetary incentives to accelerate the adoption of these nascent technologies. Buyers of hybrid and electric vehicles will receive monetary support to incentivize their purchases. Additionally, NEMMP policy aims to encourage domestic manufacturing of electric vehicle components, with a specific focus on batteries. To attract investments in the EV battery manufacturing sector, the government has introduced various incentives, subsidies, and tax benefits. These measures are designed to create a favorable environment for battery manufacturers to establish and expand their production capacities within the country.

Several steps have been implemented under the NEMMP framework to promote the adoption of electric vehicles and support the growth of the EV battery manufacturing sector. These include:

- Tax Saving on EV Loans
- Reduced GST Rates
- Incentives for Charging Infrastructure
- Exemption of Permit

Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) India Scheme:

The Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India (FAME India) scheme is a significant initiative launched by the Indian government to promote the adoption and manufacturing of electric and hybrid vehicle technology. The scheme was initially introduced in 2015 and subsequently updated as FAME India Phase II in 2019, with an allocated budget of Rs. 10,000 Crore for a period of three years starting from 1st April 2019. FAME India Phase II was initially designed as a three-year subsidy program with the primary goal of supporting the electrification of public and shared transportation in the country. With an extension until March 2024, the scheme aims to facilitate the adoption of electric and hybrid vehicles across various segments, including electric buses, three-wheelers, four-wheeler passenger cars, and two-wheelers. The ambitious targets set by the government include the deployment of approximately 7,000 electric and hybrid buses, 500,000 electric three-wheelers, 55,000 electric four-wheeler passenger cars, and 1 million electric two-wheelers.

Production-Linked Incentive (PLI) Scheme

The Production Linked Incentive (PLI) scheme, known as the '**National Programme on Advanced Chemistry Cell (ACC) Battery Storage**,' was introduced in 2020 with the primary objective of promoting domestic manufacturing of advanced chemistry cell batteries, particularly lithium-ion batteries. The scheme aims to enhance India's manufacturing capabilities in the battery sector and reduce the country's reliance on imported batteries. In addition, the PLI scheme is not only aimed at supporting the growth of the electric vehicle sector but also facilitating the demand for battery storage solutions in stationary applications.

The National Mission on Transformative Mobility and Battery Storage (NMTMBS)

NMTMBS established in 2019, is a strategic initiative by the Indian government to drive mobility initiatives and promote the development of sustainable transportation solutions. One of the key objectives of the mission is to set up large-scale manufacturing plants for electric vehicle (EV) batteries and components, fostering the growth of a robust EV ecosystem in the country.

Phased Manufacturing Program (PMP)

The Phased Manufacturing Program (PMP) is a strategic initiative by the Indian government aimed at promoting the localization of Electric Vehicle (EV) components, including batteries, in a systematic manner. The primary objective of the program is to increase the domestic value addition in the production of these components, ultimately reducing the overall cost of EVs and enhancing their affordability for consumers.

The PMP focuses on encouraging indigenous manufacturing of electric vehicles, their assemblies, sub-assemblies, and various parts. It envisions a graded duty structure that promotes progressive indigenization over a period. By gradually reducing import duties on EV components, the government aims to incentivize and support the growth of domestic manufacturing in the EV sector.

Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS):

The Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS) is a transformative policy initiative that addresses the challenges faced by the domestic manufacturing of electronic components and semiconductors in India. It is designed to bolster the electronics manufacturing ecosystem in the country.

The scheme provides financial incentives of 25% on capital expenditure for a specific list of electronic goods. These goods represent the downstream value chain of electronic products, including electronic components, semiconductor/display fabrication units, ATMP (Assembly, Testing, Marking, and Packaging) units, specialized sub-assemblies, and capital goods required for manufacturing the aforementioned goods. The focus on high-value-added manufacturing enhances the overall competitiveness of the electronics industry in India.

COMPETITIVE LANDSCAPE

The storage battery market in India is consolidated. Exide Industries and Amar Raja Batteries Ltd are considered the leaders in Indian storage battery segment. Together, these two players account for major in the storage battery market. Both the players cater to the OEMs as well as replacement in automotive and serve to wide range of industries in industrial segment including Telecom, Grid scale energy storage, Railways, Power Control, Solar and UPS. H B L Power Systems Ltd., High Energy Batteries (India) Ltd., Luminous Power Technologies Pvt. Ltd., and Okaya Power Pvt. Ltd., amongst other players operating in the storage battery segment.

In Lithium-ion segment, India has seen good progress in battery pack manufacturing segment and there exists intense competition amongst manufacturer for importing cells from China and assembling them into packs to fulfill domestic demand. As per JMK research stakeholder consultation, of the total cost of LiBs, cells account for 65%, the battery pack 15%, BMS 15%, and the balance being the outer box. Currently, battery pack and associated BMS manufacturing is entirely dominated by domestic players. Indian manufacturer can produce most of the sub-components that go in a battery pack viz-a-viz copper harness, terminal, non-reactive glue, and outer casing, while thermal pads are imported by India and BMS and outer box are also primarily supplied by the Indian battery pack assemblers only.

Currently, while few firms are engaged in trading in battery packs and cells imported from abroad, many battery manufacturers prefer to manufacture batteries locally which have superior quality though costlier when compared to Chinese counterparts. The LiB pack manufacturing market in India is fragmented and comprised of numerous active players including Coslight India, Okaya, Exicom, Trontek, Amptek, Lohum Cleantech, Cygni, Grinntech, Pure EV etc. Most players have been serving both the EV and stationary markets with companies in this segment compete based on

configuration of battery packs, quality, durability, recharge cycle, and application. Witnessing progress in the battery pack manufacturing, the industry stakeholders are relishing development in next stage of value chain that is cell manufacturing.

Existing battery manufacturers like Amara Raja and Exide which are also leading players in LAB manufacturers in India, have already announced their plans to start lithium-ion cell manufacturing. Beside existing battery manufacturer, the lucrative cell manufacturing business is also attracting automotive component manufacturing, like Lucas TVS and Denso, and automobile manufacturing, like Suzuki Motor Corporation, the parent of Maruti Suzuki, the largest carmaker in India and Tata group. In addition to above and after the revised PLI ACC scheme, the country's big business conglomerates the likes of Adani Group, Larsen and Toubro Ltd (L&T), Bharat Heavy Electricals Ltd. (BHEL), and Reliance Industries Ltd., which have no previous experience in battery manufacturing, have also shown interest in investing in cell manufacturing in India.

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