

Industry assessment for Clean Air systems, Ignition systems, Bearings, Sealings, Shock Absorbers & Struts and Aftermarket for Ignition, Bearings, Sealings and Shock Absorbers & Struts

Tenneco India

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Macroeconomic Overview of the Global & Indian Economy

Overview of the Global Economy

Review and Outlook of Global GDP

Global economic growth remained rangebound during CY2024 with several large economies showing resilience despite geopolitical tensions, high interest rates and the growing intensity of extreme weather events. Further tightening of financial conditions also challenged global trade and industrial production in CY2024.

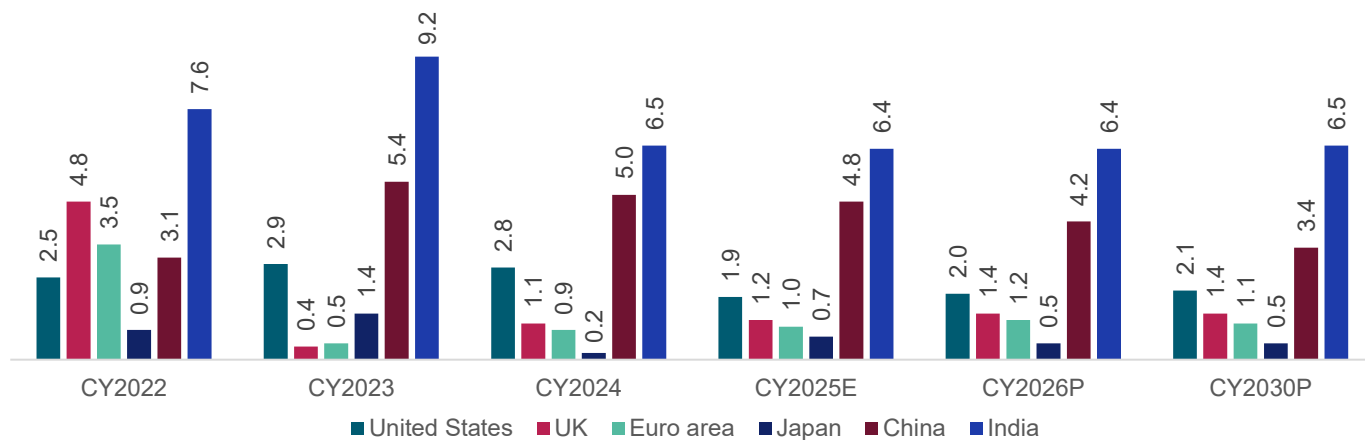
However major policy shifts are resetting the global trade system and bringing uncertainty to the resilient global economy. The outlook for global trade has declined sharply due to surge in tariffs and trade policy. The new tariff measures by the United States and countermeasures by its trading partners may have adverse impact on economic growth and inflation. The sudden rise in trade tension and high level of policy uncertainty is expected to have a notable impact on global economic activity. In turn, the global growth pace is projected to decline in CY2025.

Global growth is expected to decline at 3.0% in CY2025 compared to 3.3% in CY2024. Growth in advanced economies is projected to slow on account of greater policy uncertainty, trade tensions, and softer demand momentum. Growth in advanced economies is projected to be at 1.5% in CY2025 and 1.6% in CY2026. The US economy expected to slow down to 1.9% in 2025 compared to 2.8% in CY2024, due to higher tariffs and cut down in government spendings. In Euro area marginal growth is expected, 1.0% in CY2025 compared to 0.9% in CY2024.

In emerging markets and developing economies, growth is expected to slow down to 4.1% in CY2025 compared to 4.3% in CY2024, with significant downgrades for countries affected most by recent trade measures. The growth outlook for China has been revised upward to 4.8% a significant increase of 0.8% from the previous estimates of IMF. This upward revision is driven by the country's better than expected performance in the first half of CY2025 as well as substantial reduction in tariffs between the US and China which has boosted economic activity.

The growth outlook is more stable for India despite global environment uncertainty and subdued growth. The growth is projected to be at 6.4% in CY2025 compared to 6.5% in CY2024. The steady expansion of the economy is supported by private consumption, particularly in rural areas. India has emerged as the fastest growing major economy outpacing the growth of major countries to become the world's fourth largest economy in fiscal 2025.

GDP growth (% y-o-y) of key economies



Note: On Calendar Year (CY) basis

* The Euro area comprises 19 member countries of the EU

Source: International Monetary Fund (IMF); World Economic Outlook (WEO) – July 2025 update, Crisil Intelligence

Review and Outlook of Inflation in Key Economies

The global inflation rate is expected to decline to 4.2% in CY2025 and 3.6% in CY2026, largely consistent with IMF previous estimates. This decline is driven by weakening demand and decreasing energy prices. In advanced economy, inflation is expected to decline by 2.4% in CY 2025 compared to 2.8% in CY2024. However, for the United States inflation rose to 2.9% in CY2025 compared to 2.4% in CY2024. In the US, tariffs are expected to gradually impact consumer prices leading to higher inflation in the second half of CY2025 however, these tariffs will have a dampening effect on inflation in the other regions. Inflation is projected to be above 2% target until CY 2026. Whereas the euro area is likely to see more moderate inflation due to factors such as currency appreciation and one-time fiscal measures. In emerging and developing Asia the inflation rose to 2% in CY2025 compared to 1.6% in CY2024. In China the headline inflation is relatively stable while core inflation is expected to rise slightly to 0.5% in CY2025 and 0.8% in CY2026 driven by a recent higher than expected record and reduced tariffs.

The inflation outlook at the overall level has posed significant challenges and is subject to high uncertainty, particularly the recently imposed tariffs across countries. Tariffed countries face a negative demand shock as export demand diminishes, exerting downward pressure on prices. Trade uncertainty adds to the layer of demand shocks while households postpone investment and spending and this effect is boosted by tighter financial conditions and increased exchange rate volatility.

The global economy is expected to slow down due to increased US tariffs, which will reduce demand for exports, and impacting the global growth. Global growth is expected to decline to 3.0 % in CY2025 from 3.3% in CY2024.

Consumer price inflation (year-on-year, %)

	Jan-25	Feb-25	Mar-25	April-25	May-25	June-25	July-25
US	3.0	2.8	2.4	2.3	2.4	2.7	2.7
UK	3.0	2.8	2.6	3.5	3.4	3.6	3.8
Euro area	2.5	2.3	2.2	2.2	1.9	2.0	2.0
Japan	4.0	3.7	3.6	3.5	3.4	3.2	3.1
China	0.5	-1.4	-0.2	-0.4	-0.4	-0.1	-0.5
India	4.2	3.6	3.3	3.1	2.8	2.1	1.5

Source: Statistical Bureau, respective countries

Overview of the Indian Economy

Review of GDP growth over fiscals 2019-2025 and Outlook for fiscals 2026-2030

India ranks as the world's 4th largest economy and is the fastest growing among major economies. The Indian economy logged 4.3% CAGR between fiscals 2019 and 2024. Economic growth was supported by benign crude oil prices, soft interest rates and low current account deficit. The Indian government also undertook key reforms and

initiatives, such as Saptarishi priorities focused on infrastructure, green growth, and youth empowerment financial inclusion initiatives, and gradual opening of sectors such as retail, e-commerce, defense, railways, and insurance for foreign direct investments (FDIs).

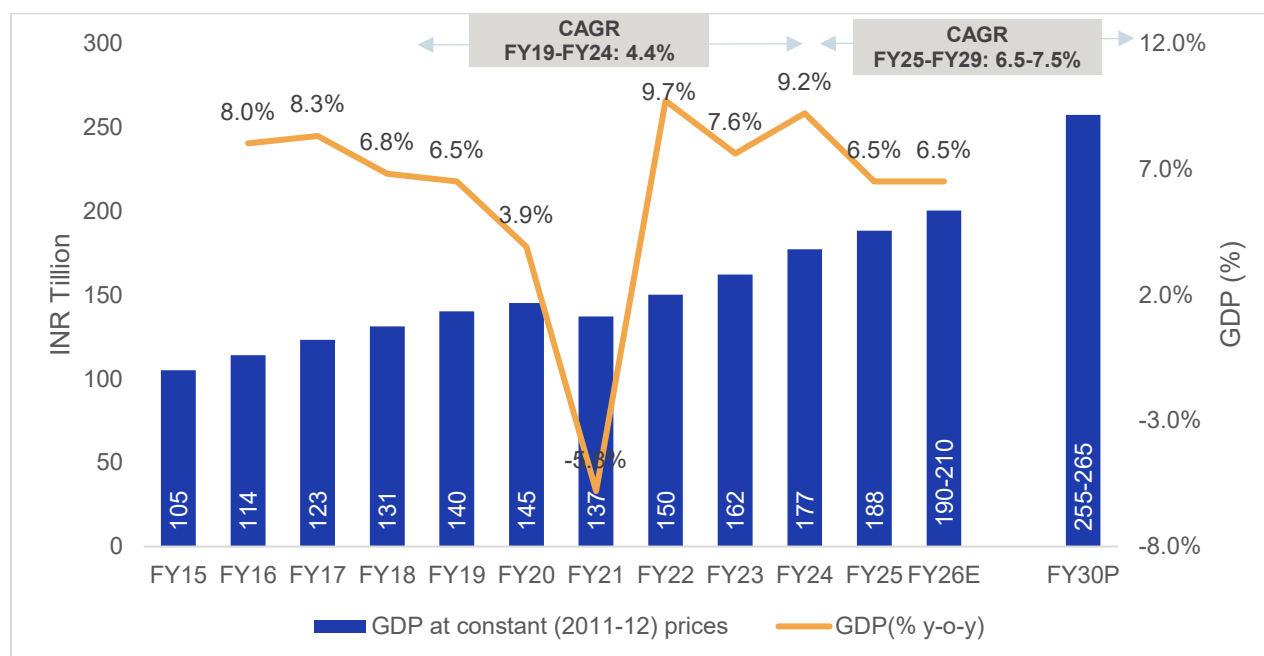
Growth surpassed forecasts in fiscal 2024, driven by strong government spending and a sharp rise in manufacturing and construction growth. Globally, growth in major economies such as the US and China beat estimates and has contributed to better export earnings for India.

According to the National statistics Offices (NSO) second advance estimates (SAE) projects India's real gross domestic product (GDP) growth at 6.5% for the fiscal 2025, slightly higher than first advance estimates.

The real GDP grew 7.8% in the first quarter of fiscal 2026 from 7.4% in the fourth quarter of fiscal 2025 and 6.5% in the corresponding quarter of fiscal 2025. Following a sluggish pace in fiscal 2024, private consumption picked up in fiscal 2025. The upward trend expected to continue with private consumption anticipated to outpace GDP growth in fiscal 2026.

Crisil Intelligence expects GDP growth 6.5% in fiscal 2026 owing to slower global growth led by tariff tensions and increase the uncertainty on investment and spending decision by businesses and households. India's goods exports are expected to be directly impacted due its trade agreement with the US; however, services exports are expected to be resilient considering domestic drivers would support growth momentum.

India's GDP growth trend and outlook



Note: FY26E- E Estimated P – projected

Source: National Statistical Office (NSO), IMF, Crisil Intelligence estimates

Near-term Review and Outlook on GDP

India transition to the world's fourth largest economy and fastest growing among major economies has been on the back of services, industry and agriculture sectors thriving.

Outlook on GDP

After a strong GDP growth in the past three fiscals, GDP growth is expected to remain steady at 6.5% in fiscal 2025 however risks given the global turmoil. GDP growth was at a five-quarter high of 7.8% in the first quarter of fiscal 2025 compared to 7.4% in fiscal 2024 for the same period. The nominal GDP growth slowed to 8.8% from 10.8%. As inflation eased and borrowing costs decreased, it gave significant boost to consumer spending.

Domestic private consumption growth strengthened despite a high base effect, boosting both manufacturing and services. Higher government spending in the first quarter contributed to a sharp rise in government consumption expenditure and healthy fixed investment growth. Export growth was fueled by the front-loading of goods exported in anticipation of higher US tariffs. On the supply side, gross value added (GVA) rose 7.6% from 6.8%. Services and manufacturing saw a significant rise in growth. A lower deflator benefited both these sectors.

Growth in mining, construction and electricity slowed due to an early onset of the southwest monsoon. Agriculture growth softened compared to the previous quarter but stayed at its quarterly decadal trend.

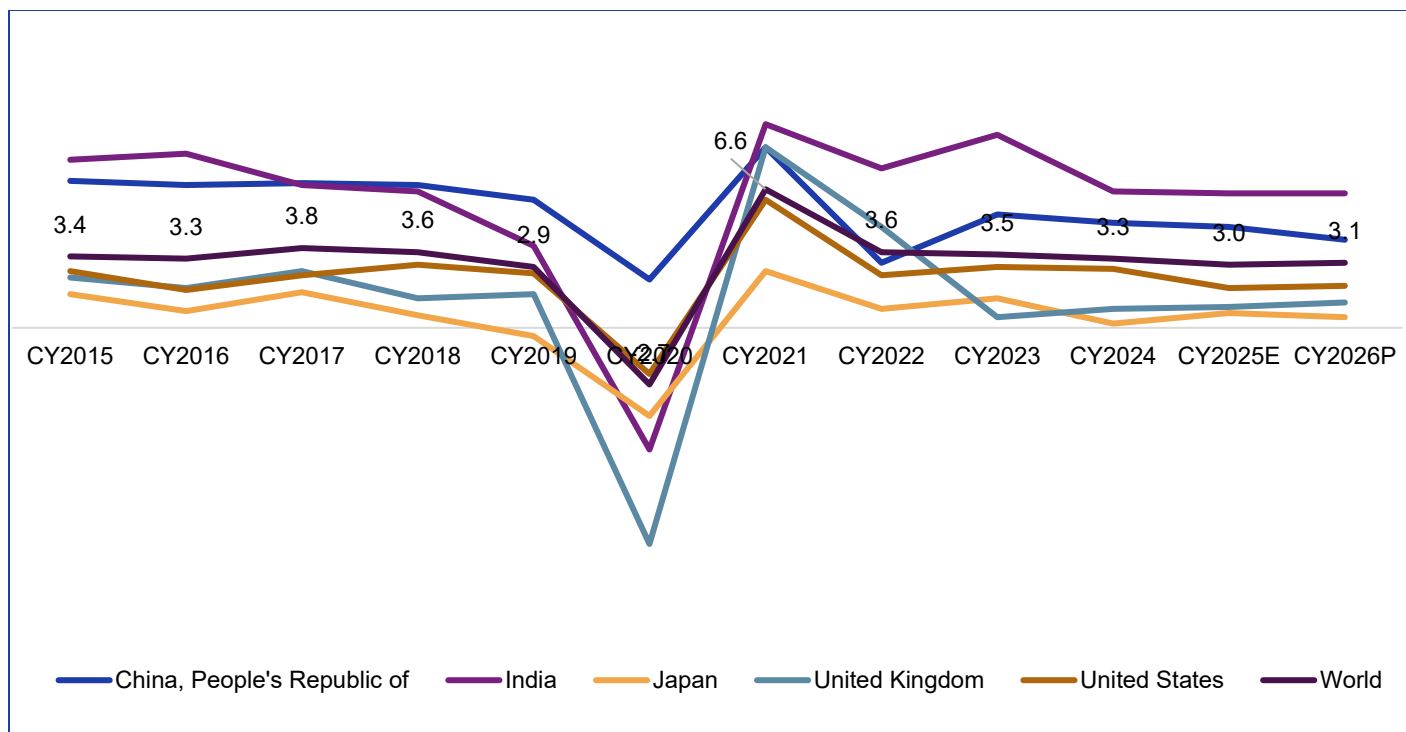
The tariffs, a global trade slowdown and geopolitical uncertainties are expected to have a non-uniform impact on the Indian economy. Consumer demand – buoyed by healthy rural incomes, lower inflation and interest rates, and government's tax relief – is expected to remain robust and support overall GDP growth, while healthy government investment spending should continue to provide buffer. Private consumption accounts for a greater share of India's GDP around 56.5% in fiscal 2025 compared to gross exports 21.6% for the same period. However, in the absence of an India-US trade deal, some export-oriented sectors expected to witness major impact, including labour-intensive sectors such as textiles, gems and jewelry and seafood. Specifically, the micro, small and medium enterprises sector faces formidable challenges.

Crisil Intelligence expect GDP growth to improve to 6.5% in fiscal 2026 with downside risks. The tariff moves and shifting global supply chains will keep domestic private corporate sector investment cautious in the fiscal 2026. However tailwinds are expected to support growth in India. A healthy monsoon, benign inflation, the Reserve Bank of India's (RBI) rate cuts, and tax relief by government are expected to strengthen domestic consumer demand.

India to remain a growth outperformer globally.

Despite slowdown in the near term, India's growth is expected to outperform over the medium run. Crisil Intelligence expects GDP growth to average 6.7% between fiscals 2025 and 2030, compared with 3.3% globally as estimated by the IMF.

India is one of the fastest growing emerging economies (GDP growth, % year-on-year)



E: estimated; P: projected

Note: GDP growth based on constant prices

Source: IMF (World Economic Outlook – July 2025 update), Crisil Intelligence

Key factors impacting the business environment.

- Strong domestic demand is expected to drive India's growth over peers in the medium term.
- Medium-term growth is anticipated to be bolstered by increased capital spending on infrastructure and asset development projects, leading to enhanced growth multipliers.
- The government's future capital expenditures are expected to be supported by factors such as tax buoyancy, simplified tax structures with lower rates, tariff structure reassessment, and tax filing digitization.
- Investment prospects are optimistic, given the government's capex push, progress of Production-Linked Incentive (PLI) scheme, healthier corporate balance sheets, and a well-capitalized banking sector with low non-performing assets (NPAs).

GST reforms to accelerate consumption and support domestic sales.

- The Government of India has revamped the Goods and Services Tax (GST) structure with three slabs of 5%, 18% and 40%.
- In the automobile industry, electric vehicles will continue to be taxed at 5%, while other segments have undergone a rate revision to either 18% or 40% (see tables below)

Table 1: Consumption driven goods.

Category	Items	Old GST Rate	New GST rate
Consumer Electronics	Air Conditioners, Dishwashing Machines, TVs over 32 inches, Monitors, Projectors	28%	18%
Food Items	Packaged namkeens, Sauces, Pasta, Instant Noodles, Chocolates, Coffee, Preserved Meat, Cornflakes, Butter, Ghee, etc.	12%	5%
Food Items	Packaged namkeens, Sauces, Pasta, Instant Noodles, Chocolates, Coffee, Preserved Meat, Cornflakes, Butter, Ghee, etc.	18%	5%
Daily usage items	Hair oil, soap bars, shampoos, toothbrushes, toothpaste, tableware, kitchenware, other household articles, etc.	12-18%	5%

Note: Green colour shade indicates positive impact; Red indicates negative impact

Scale of impact indicates positive/negative impact on the demand of CV segments mentioned in the subsequent column.

Source: Press release document by MoF dated 3rd Sep 2025

- Lower GST on consumer goods, food, and daily-use items to reduce expenditure for households, leaving them with more money to spend. This is likely to boost overall consumption, especially in price-sensitive rural and semi-urban areas.
- Higher demand for essentials will increase goods movement, which will benefit SCVs and LCVs for last-mile deliveries and ICVs for mid-mile distribution.

Table 2: Primary /bulk goods

Category	Items	Old GST Rate	New GST rate
Cement and other construction materials	Marble and travertine blocks, Granite blocks	12%	5%
	Portland cement, aluminous cement, slag cement, super sulphate cement and similar hydraulic cements, whether or not colored or in the form of clinkers	28%	18%
	Sand lime bricks or Stone inlay work	12%	5%
Coal/Lignite and derived fuels	Coal: briquettes, ovoid's and similar solid fuels manufactured from coal	5%	18%
	Lignite, whether or not agglomerated, excluding jet	5%	18%

Source: Press release document by MoF dated 3rd Sep 2025

- The reduction in GST on cement and other construction materials will lower project costs, make infrastructure and build projects more affordable. This is likely to boost construction activity across urban and semi-urban areas.
- On the other hand, higher GST on coal and lignite may increase raw material production costs. As a result, M&HCV (cargo) and Tippers may witness moderate change/increase in freight volumes.

Table 3: Others

Category	Items	Old GST Rate	New GST rate
Agriculture	Tractors, harvesters, sprinklers, drip systems, pumps	12%	5%

Source: Press release document by MoF dated 3rd Sep 2025

- The reduction in GST on agricultural inputs such as seeds, fertilizers, and farm equipment will lower costs for farmers, improving affordability.
- Lower GST on medical, healthcare, and insurance services will reduce household expenses on essential services, effectively increasing disposable income.
- This is likely to moderately increase consumption, hence support demand for SCV, LCV, and ICV segments.

Table 4: GST for vehicle pricing

Category	Old GST Rate	New GST rate
Buses	28%	18%
Light commercial vehicles (LCV) - Goods	28%	18%
Medium and heavy commercial vehicles (MHCV) – Goods	28%	18%

Source: Press release document by MoF dated 3rd Sep 2025

- Prices for LCVs, MHCVs and buses will reduce by about ~7.8%. However, it does not consider any pass-through that may happen from automotive component manufacturers to original equipment manufacturers (OEMs) in the form of GST reduction as all automotive components have been brought under the ambit of 18%.
- From a domestic sales perspective, in fiscal 2026, CVs may see flat-to-marginal-positive growth.

Category	Criteria	Old GST Rate	New GST rate
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Small Cars (Petrol/LPG/CNG)	Engine less than equal to 1,200 cc & length less than equal to 4m	28% + 1% cess	18%
Small Cars (Diesel/Diesel- hybrid)	Engine less than equal to 1,500 cc & length less than equal to 4m	28% + 3% cess	18%
Larger/Luxury Cars/SUVs/Big Cars	Engine greater than 1,500 cc & length more than 4m	28% + compensation cess (variable)	40%

Source: PIB.gov published on 8th Sept 2025

- By reducing the effective rate on small cars to 18% and capping larger vehicles at 40%, the government has simplified what was earlier mix of GST plus compensation cess.
- No more cess on any of these car categories. The compensation cess (which added up significantly in luxury/large vehicle segment) is removed under the new structure.

Potential Impact of US tariffs.

India's share of global merchandise exports doubled to 1.8% in fiscal 2023 from 0.9% in 2005. However, the global economy is undergoing significant challenges due to slowing international trade and rising geopolitical tensions. The recent tariffs imposed by the US, as well as potential counter measures from affected countries, are likely to significantly impact global trade patterns. Specifically, the US has introduced an additional 25% tariff on Indian goods, effective 21 days from August 6, 2025, citing India's ongoing purchase of Russian oil. This new tariff adds to the existing 25% tariff announced on July 31, 2025, resulting in a total additional tariff of 50% on Indian products.

Despite the challenging trade environment, India remains engaged to strengthening its bilateral relationships. From a global trade perspective, the US market is significantly larger and more crucial for export opportunities compared to the countries with which India has recently signed trade agreements. To put this into perspective, India's trade deals with the UAE, Australia, and the UK, signed over the past three years, collectively account for around 6% of global merchandise trade. In contrast, the US constitutes 14% share of worldwide merchandise imports. Moreover, the US is a vital market for India's exports, share approximately 20% of India's total merchandise exports in the fiscal year. Between fiscal 2021 and 2025, India's merchandise exports to the US grew at a remarkable 14% CAGR, outpacing the overall export growth rate of 11% CAGR.

The recent shift in US trade policy, including the imposition of a 50% tariff on Indian goods, is expected to have a profound impact on key manufacturing sectors such as textiles, leather, gems and jewelry, and marine products. However, certain sectors like pharmaceuticals, smartphones, energy, and specific chemicals are currently exempt from these additional tariffs. We believe that this steep tariff may be a negotiating tactic, and the final tariffs agreed upon could be lower. For example, in April 2025, the US initially imposed a 145% tariff on Chinese goods however eventually settled on a significantly lower rate of 34% ad valorem duty and 20% additional duty, totaling 54%. This suggests that there may be room for negotiation and a potential reduction in tariffs.

The tariff shock over the past three months has added to the uncertainty, putting investments on hold in the short term as corporates await certainty and stability on tariffs to gauge their ultimate impact. To mitigate the potential impact of US tariffs on its exports, India could harness the benefits of the recently concluded India-UK trade deal, apart from accruing benefits from other free trade agreements (FTAs; with Australia and the UAE). As for the India-UK Comprehensive Economic and Trade Agreement (CETA), it is yet to be ratified, so the benefits are likely to materialize only after a few months.

India-UK Trade Agreement

With India and the UK inking the CETA on July 24, 2025, trade opportunities for domestic companies in the manufacturing and services sectors are set to increase. The UK alone accounts for 3% share of world merchandise imports compared with a combined 2% share in the case of Australia and the UAE, with which India signed trade deals in 2022. Specifically, the total goods and services trade between the UK and India was over \$45 billion in 2024, with India's exports to the UK at ~\$28 billion and imports from the UK at ~\$18 billion.

Highlights of the agreement

- Bilateral trade to increase by \$30 billion annually by 2040.
- The agreement eliminates tariffs on 99% of Indian goods for the UK market.
- India applies Tariff rate Quotas (TRQs) to sensitive high value goods.

Under the CETA, India has granted the UK access for 12,540 commodities. Of these, an impressive 62% of tariff line items are duty-free from the first day of implementation. This move underscores India's commitment to opening its market while still protecting critical domestic sectors. Key commodities benefiting from this immediate duty-free access are products of plant and animal origin, marine products and a wide range of chemicals. The tariffs on imports of gin and scotch from the UK will halve from 150% on day one and eased to 40% from year 10 onwards. For many other alcoholic beverages, the duty will reduce to 110% from the current 150% and continue to be lowered in nine equal slabs from next year. After 10 years, the duty will stand at 75%. UK car manufacturers will benefit from reduction in tariffs to 10% from up to 110%, starting with internal combustion engine cars and transitioning to electric vehicles and hybrids. Prior to the CETA, India's applied most favored nation (MFN) tariffs on imports of UK goods were relatively high, at a trade-weighted average of ~16% across all tariff lines. This agreement will reduce that to 4-5%.

As for India, the UK has granted access to nearly 99% of Indian goods, with 80% of the goods covered duty-free from the day of implementation. The immediate elimination of tariff dramatically improves the competitiveness of Indian exports in the UK market, with pharmaceuticals, gems and jewellery, and textiles among the biggest winners. For Indian imports, the UK's MFN applied tariffs will fall from a trade-weighted average of 2% to almost 0%, with gains to sectors such as textiles outpacing overall export growth from India to the UK. For reference, prior to the CETA, India's apparel sector faced a duty disadvantage of ~10%, which posed challenges for exporters in sustaining their order books. As a result, many core products that were previously produced in India shifted to Bangladesh and other manufacturing destinations. However, with the current agreement, India now has a level playing field.

Impact on the Auto Industry due to US tariffs and UK FTA

- The US tariffs are more of a slowdown in the short to medium term: they can disrupt export revenues, force reconfiguration of supply chains, and squeeze margins.
- The UK-India FTA is more of a medium to long-term opportunity: it lowers entry barriers, especially for premium vehicles, but there are qualifications and gradual implementation that temper its immediate effects. The FTA opens doors for Indian component makers and EV related firms to export to UK markets under more favorable duty structures. For consumers, the FTA may bring down the cost of imported luxury/premium/UK-manufactured cars gradually.

Key factors in the budget 2025-26 that can influence medium to long-term growth:

- Stronger Consumption Support: Tax relief measures and enhanced allocations for welfare programs like PMAY, PMGSY and MGNREGS (Mahatma Gandhi National Rural Employment Guarantee Scheme) to boost demand and economic activity. Recently there was a key announcement made during the union budget 2025-26 in February 2025 pertaining to direct taxes. As per the new tax regime, no income tax payable up to the annual income of Rs 12.75lakh and a new tax bracket subject to 25% tax added to 20-24Lakh income tax slab.

- **Sustained Infrastructure Investment:** Increased funding for roads, highways, railways, and urban development, driving long-term growth and job creation.
- **Government-Led Capital Expenditure:** Continued high Capex allocation supporting various industries.
- **Employment & Skilling Initiatives:** Allocations for new employee generation schemes, vocational training, and opening of 'centre of excellence' will enhance workforce productivity and help in skilling the youth of the country.
- **Push for Innovation & Industrial Growth:** Increased R&D funding, incentives for EVs and electronics manufacturing, and export promotion to strengthen India's global competitiveness.

Lowering supply chain dependency on China

India including other nations are actively pursuing strategies to reduce supply chain dependency on China in the wake of pandemic and growing geo-political tensions.

This includes diversifying the supply chain by sourcing inputs from various countries with a goal of reducing the risk of relying on a single country. Furthermore, India is also trying to strengthen the domestic manufacturing environment through various policy initiatives. Key strategies adopted by India to diversify the supply chain includes:

Foreign investments: India is attracting multi-national companies those who are actively seeking to diversify their manufacturing bases away from China. Government is aiding these companies in terms of tax benefits and incentive schemes. India has also published new policies on FDI to attract investments from various countries across sectors.

- **Domestic manufacturing:** Government is pushing domestic companies to develop products locally and bring certain level of localization in the products, thereby reduce dependence on China. This involves introduction of initiatives and schemes like Make in India, Atmanirbhar Bharat, China plus one, PMP and PLI.
- **Trade diversification:** India is actively engaging in trade pacts and FTA to diversify their trade partners. Strengthening trade ties with developing and developed economies offers alternatives to sourcing goods and technology.

To reduce the dependency on China and prepare for potential future supply chain challenges, 14 nations under the Indo-Pacific Economic Framework (IPEF), including the United States, Japan, and India, have reached an agreement aimed at augmenting supply chain resilience and diversification. The agreement involves sharing information with each other and coordinating responses during the time of crises. Under the agreement, the participating countries would establish an IPEF supply chain council, supply chain crisis response network, and labor rights advisory network that will provide a framework to strengthen supply chains and prevent potential disruptions.

Driven by geopolitical shifts and rising tariffs, several MNCs are investing heavily in India to diversify production and build it as an export base,

- Apple now manufactures about ~14% of its iPhones in India, aiming 26% within a few years, via partners like Foxconn and Tata electronics.
- Walmart has boosted sourcing from India across categories like toys, apparel and electronics.
- Vietnam based Vinfast has planned to invest Rs 4,000 crore in the next 5 years and have started construction of their EV manufacturing facility in Tamil Nadu.

Together, these points highlight India's growing strength as a global manufacturing and export hub.

Atmanirbhar Bharat Campaign

Atmanirbhar Bharat Abhiyan or the self-reliant India campaign was launched in May 2020 amid the Covid-19 pandemic, with a special and comprehensive economic package of INR 20 trillion, equivalent to 10% of the country's GDP.

The scheme was launched with the primary intent of fighting the pandemic and making the country self-reliant based on five pillars: economy, infrastructure, technology-driven system, demography, and demand. The stimulus package announced by the government under the scheme consisted of five tranches, intended to boost businesses, including Micro, Small and Medium Enterprises (MSMEs), help the poor (including farmers), boost agriculture, expand the horizons of industrial growth, and bring in governance reforms within the country.

PLI scheme provides boosts to industrial investments in the short-to-medium term.

The PLI scheme's primary objective is to make manufacturing in India globally competitive by removing sectoral obstacles, creating economies of scale and ensuring efficiency. It is designed to create a complete component ecosystem in India and make the country an integral part of the global supply chain. The PLI scheme is a time-bound incentive scheme by the government which rewards companies in the 5-15% range of their annual revenue based on the companies meeting pre-decided targets for incremental production and/or exports and capex over a base year. The stronger-than-expected pick-up in demand and larger companies gaining share over smaller companies led to revival of capex in fiscal 2022. The rise in fiscal 2024 was on account of the expansion plans underway by India Inc.

In Budget 2025-26, government has increased its allocation to the PLI scheme to ~ Rs. 17,517 crores for fiscal 2026, aimed at driving growth across industries and enhancing competitiveness. Capex is expected to peak in the next two fiscals, followed by incentive payouts, which will support the growth of Indian businesses and reduce import dependence.

Budgeted incentives for each sector under the PLI scheme in budget 2025-26

Sector	Segment	FY26 Budget Estimates (INR Crore) *	
Automobile	Advance chemistry cell (ACC) battery	156	2,975
	Automobiles and auto components	2,819	

Source: Budget Document 2025-26, Crisil Intelligence

Urban Population growth metrics

According to United Nations Population Division (World Urbanization Prospects: 2018 Revision) urban population constituted 36% of the total population in India in CY2023, which had increased by 14% in the previous 10 years. The urban population accounted for approx. 519 million people in CY2023, already the second largest urban community in the world. India's urban population is projected to be 675 million in 2035, which will be ~43% of the overall Indian population. In the interim, the urban population is expected to be approximately 542 million in 2025 and 607 million in 2030. According to the Economic Survey 2023-24, it is expected that by 2030, more than 40 percent of India's population will live in urban areas.

Rise of the Middle Class

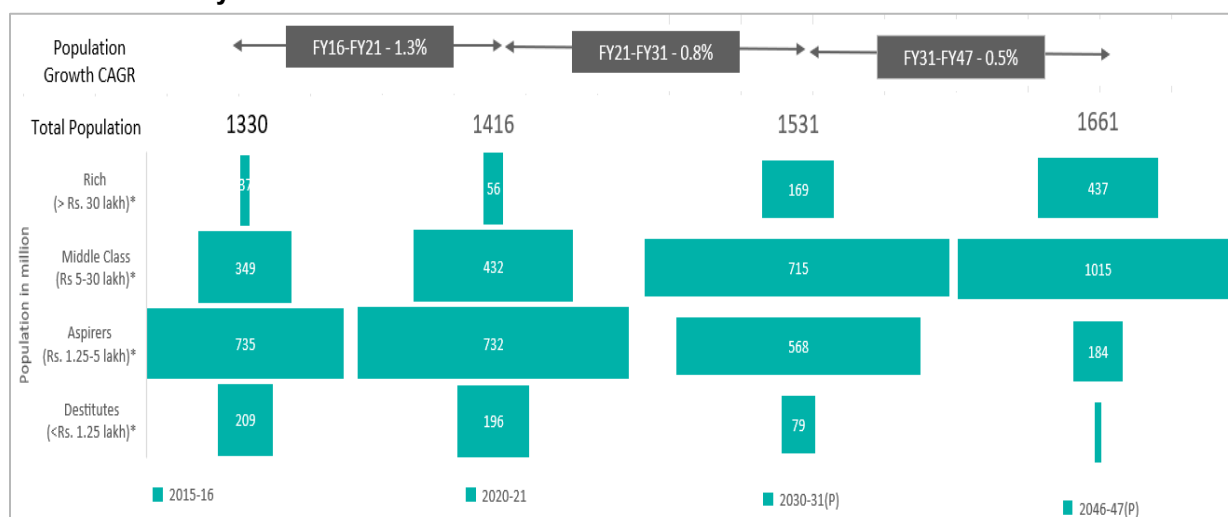
As per Crisil estimates, India's GDP is expected to grow ~6.7% between FY25 - FY31 to make it the third largest economy with a GDP inching closer to USD 7 trillion and lift per capita income to the upper middle-income category. By fiscal 2031, India's per capita income will rise to ~USD 4500, thereby making it an upper middle-income nation. (As

defined by World Bank, lower middle-income countries are those with per capita income of USD 1,000 to USD 4,000 and upper middle-income countries are those with per capita income of above USD 4,000 to ~USD 12,000)

As per PRICE ICE 360° survey report, India is poised for significant economic growth, by 2047 if political and economic reforms yield the desired outcomes. With a projected conservative annual growth rate of 6-7%, the country could see substantial increases in average annual household disposable income.

By the end of this decade, the demographic structure of the country will shift from an inverted pyramid, which represents a small wealthy class and a large low-income class, to a rudimentary diamond shape. In this new structure, a significant portion of the low-income class will transition to the Middle Class. Consequently, the income distribution will feature a small lower layer comprising the Destitute and Aspirer groups, a substantial Middle Class, and a sizable wealthy Rich layer at the top by end of the decade. The growth rate of the population is notably higher for the upper income groups compared to the lower income groups. In fact, the growth rate for the lowest income groups may even be negative.

India's Income Pyramid



Note: *: Annual household income at 2020-21 prices

Source: ICE 360 survey PRICE, Crisil Intelligence

Rural income growth numbers

The average monthly income of households saw a substantial rise of 57.6% over a five-year period, increasing from Rs. 8,059 in 2016-17 to Rs. 12,698 in 2021-22. This indicates a nominal compound annual growth rate (CAGR) of 9.5%.

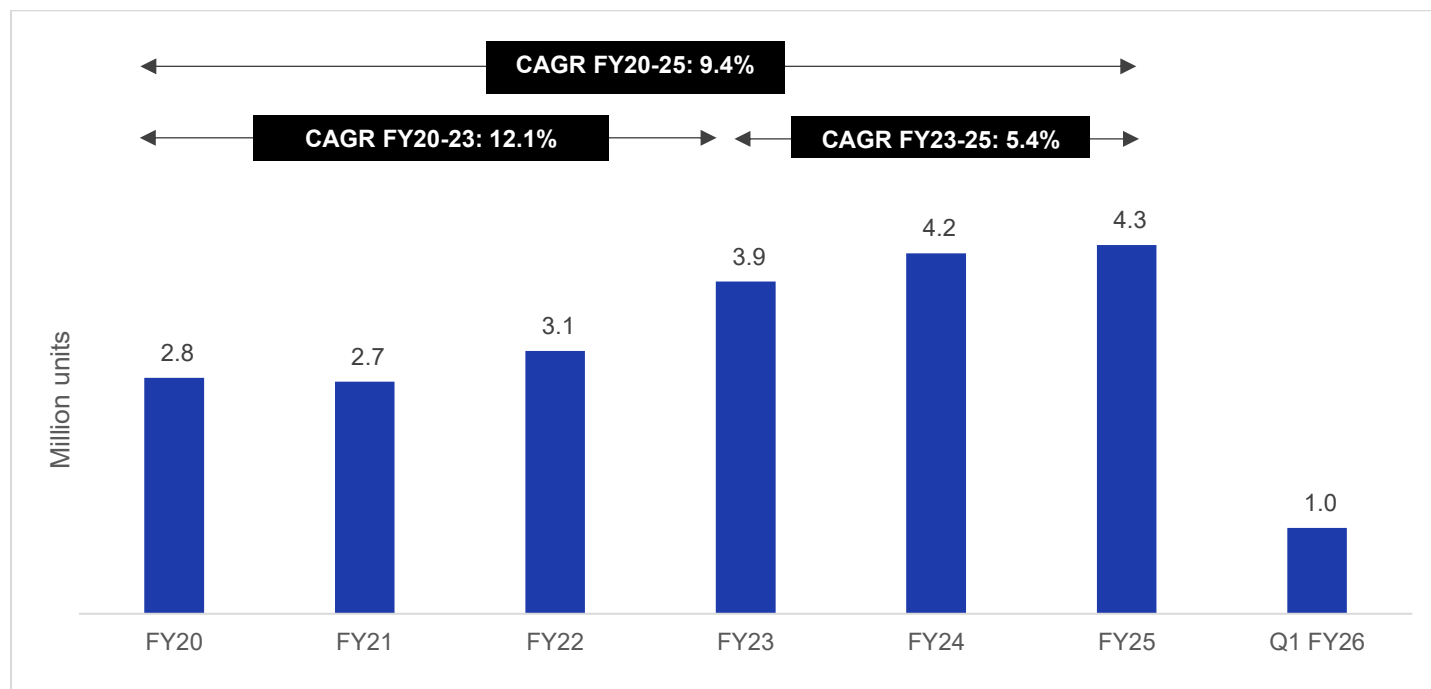
The annual average financial savings of households increased to Rs. 13,209 in 2021-22 from Rs. 9,104 in 2016-17. Overall, 66% of households reported saving money in 2021-22, compared to 50.6% in 2016-17. Rural households have experienced notable improvements in income, savings, insurance coverage, and financial literacy.

Review and outlook of Indian Passenger vehicle industry

Review of Indian domestic PV industry (fiscal 2020 to Q1 2026)

Between fiscals 2020 and 2023, India's domestic PV sales clocked 12.1% CAGR. From the low base of fiscal 2021, PV sales bounced back and grew healthily to reach a historic high of 4.2 million vehicles in fiscal 2024, registering a CAGR of 16%.

Review of domestic PV sales volume



Source: SIAM, CRISIL Intelligence

In fiscal 2023, the PV industry grew 27% y-o-y, more than double the rate 13% y-o-y witnessed in fiscal 2022. The orderbooks of auto OEMs were further supported by several new launches in the growing SUV category, which saw higher traction. Facelifts of existing models and easing supply of semiconductors also helped. In fact, overall wholesale volumes reached a historic high of 3.9 million units in the fiscal.

Fiscal 2024 marked the third year of consecutive growth in PV industry by recording 8% growth. This growth was over a high base of fiscal 2023. During the year, the orderbooks of auto OEMs were further supported by a plethora of launches in the growing UV (Utility vehicles) category, which had witnessed high traction, along with multiple facelifts of existing models and easing semiconductor supplies that drove record sales in each quarter in fiscal 2024. The overall wholesale volumes settled at ~4.2 million units in fiscal 2024.

During fiscal 2025, growth momentum of the industry continued, albeit at a slower pace, backed by the continued traction for the SUV segment, intermittent launches and improvement in disposable income. On the high base of fiscal 2024, the industry grew 2.5% in fiscal 2025 to hit a record 4.3 million units in fiscal 2025.

The domestic sales in Q1 of fiscal 2026 reached 1.01 million units, a marginal decrease of 1.4% compared to Q1 of fiscal 2025. UV segment grew by 3.8% and continued to dominate contributing around 66% of overall PV sales while hatchback segment saw significant decline by 11.2%.

Segmental shifts amidst premiumization

Based on body types, PVs in India are broadly classified into hatchbacks, sedans, SUVs, multipurpose vehicles (MPVs) and vans. Traditionally, domestic vehicle buyers have been cost conscious, with fuel efficiency and initial vehicle buying cost being the two key factors influencing the decision-making. Hence, the hatchback segment had been leading PV sales over the years primarily because of the lower ticket size and lower running costs, making them affordable to the average Indian customer.

However, with a growing share of younger buyers with global exposure, there is an increasing awareness and preference towards other parameters such as driving experience, safety, advanced features aesthetics and comfort especially considering India's challenging road conditions, which are impacting the decision-making process. It is one of the reason, customers are opting for more premium models for better comfort and ride experience. To address this change, OEMs such as Tata Motors and Hyundai have started incorporating enhanced vehicle safety in their recent launches. Several car makers have introduced advanced features in top variants and gradually incorporated them in even the mid-level variants. Furthermore, rising disposable income has fueled growth in the SUV segment.

Modern consumers in India are preferring mid-end or top end version of the vehicles moving away from the traditional fuel-efficient budget friendly small cars towards higher priced feature loaded larger cars which offer much more space, taller ride height, seamless connectivity, and improved performance. Further, there has been a major shift in customer preference with the launch of compact and mid-size SUVs. The share of small cars reduced over the last few years and share of SUVs increased. This was majorly driven by shift in consumer sentiments towards newly launched feature rich vehicles in the SUV segment.

Over the last few years, OEMs have started introducing hybrid models into the market. For example, Toyota launched Hycross and Urban Cruiser Hyryder, Maruti Suzuki launched Grand Vitara and Invicto, setting the stage for hybrid cars in India. Also, OEMs are actively launching EVs in the domestic market. Some key models include Tata Nexon, Tata Punch, MG ZS EV, MG Windsor, MG Comet and Hyundai Creta. Further, with the rise of EVs and hybrids, modern vehicles have started adding semi-active suspension system to improve ride comfort and overall handling. All these additional features have also aided the premiumization within the passenger vehicle industry.

There has been a perceptible shift in customer buying behavior, with customers prioritizing vehicle experience over costs and willing to pay a premium. They are also ready to accept longer waiting times for the desired vehicle. More and more customers are now opting to buy mid-to-top level variants that fall within their budgets. The shift towards premium vehicles is resulting in inter-segmental and intra-segmental shifts. As the market shifts towards premium vehicles, SUVs and hybrids, the demand for higher technological requirements is expected to translate to increased CPV, demand for high-performance products and critical components.

Premiumization trend in passenger cars

SUVs are now >50% of PV market share, up from ~28% in FY19



Small Car

Premium SUV

Technology offered

Clean Air Solutions

Ultra lean system

Bigger size emission system to handle higher exhaust mass flow with SCR

Advanced Ride Technologies

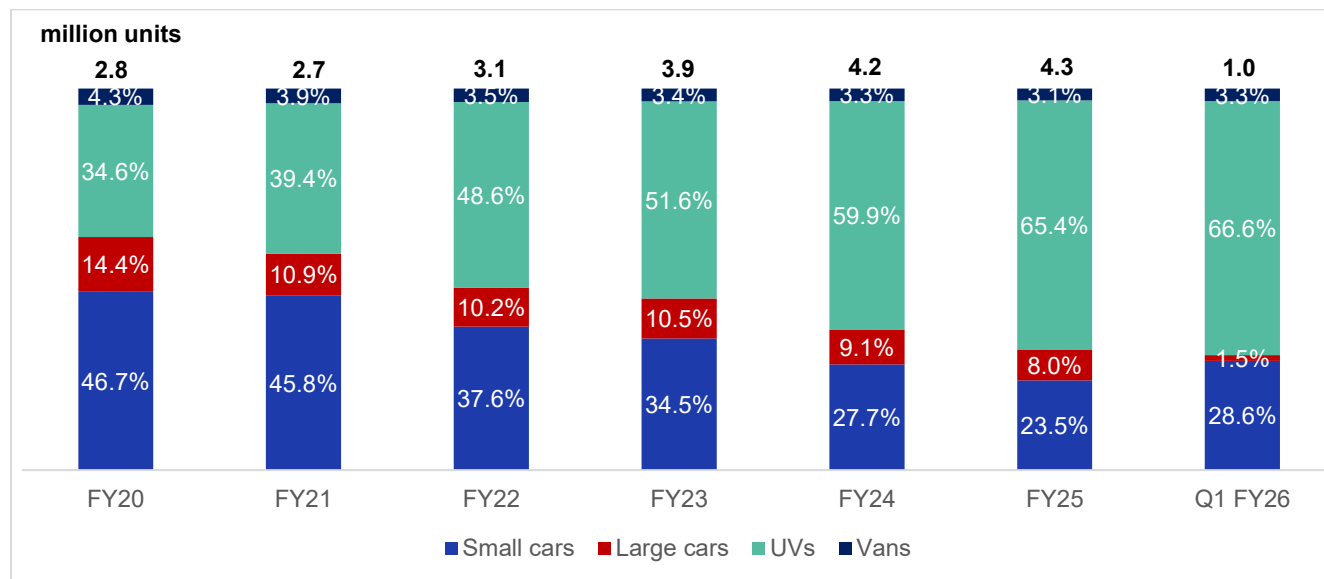
Conventional passive technology

Passive plus technology for enhanced ride comfort due to Add on technology

Market share source: CRISIL

Note: Add-on technology-Advanced ride technologies in premium SUVs have started incorporating semi-active and electronic suspension

Segment-wise trends in the overall PV sales volume in India (FY2020-Q1 26)



Source: SIAM, CRISIL Intelligence

In fiscal 2019, the share of small cars, large cars, UVs, and vans were 46.9%, 18.8%, 28.9% and 5.4% respectively.

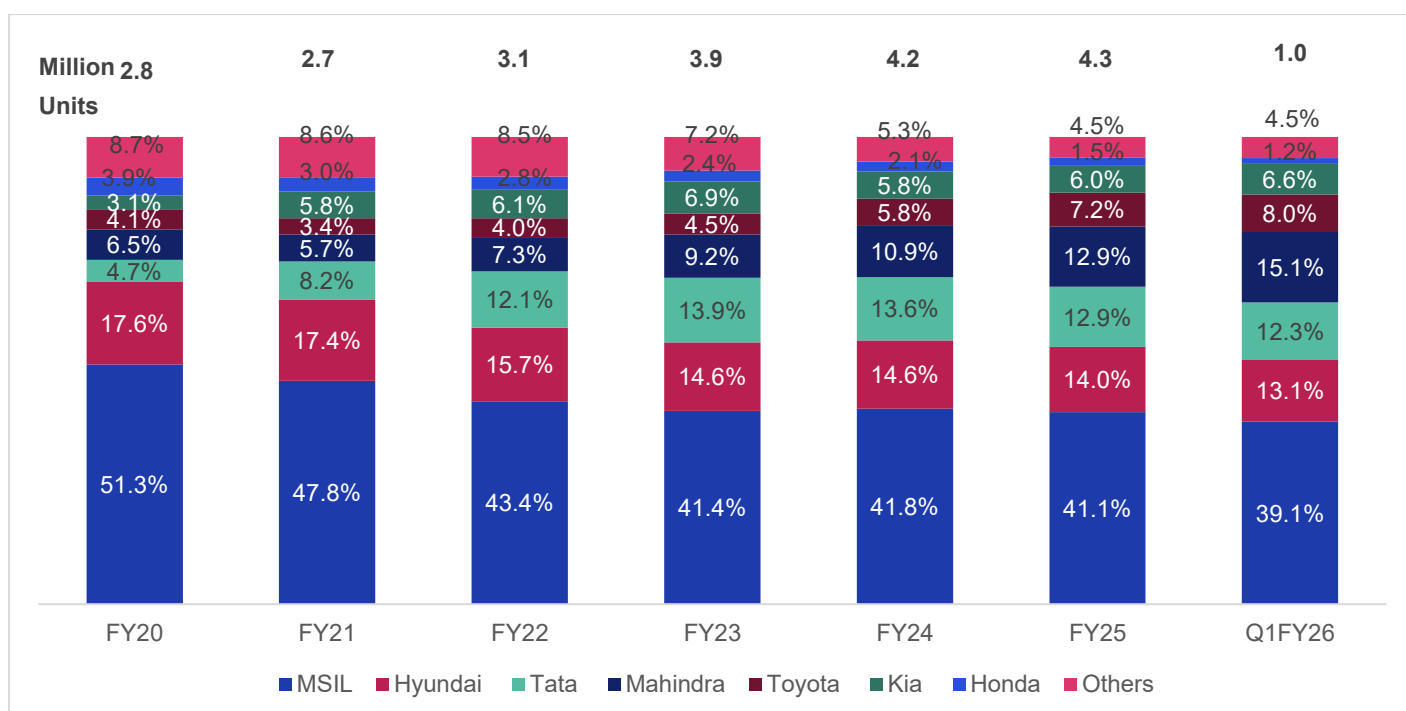
CAGR for segment-wise trends in the overall PV sales volume in India - fiscals 2020 to 2025

	Small cars	Large cars	SUVs	Vans
FY20-25 CAGR	-4.6%	-2.7%	24.2%	2.8%

Competitive OEM landscape

The domestic PV market is oligopolistic with a few players dominating the entire industry. Until fiscal 2025, Maruti Suzuki was leading the PV industry in terms of domestic sales volumes followed by Hyundai. However as of Q1 FY26, Mahindra is the second-largest contributor to domestic sales, closely followed by Hyundai and Tata Motors. These four players together account for ~80% of the market.

Domestic market share of PVs by OEM



Note:

- Others include MG, Renault/Nissan, Skoda, PCA. etc.
- Figures above the bars are sales volumes.

Source: Society of Indian Automobile Manufacturers (SIAM), CRISIL Intelligence

Changing powertrain mix in the Indian PV industry.

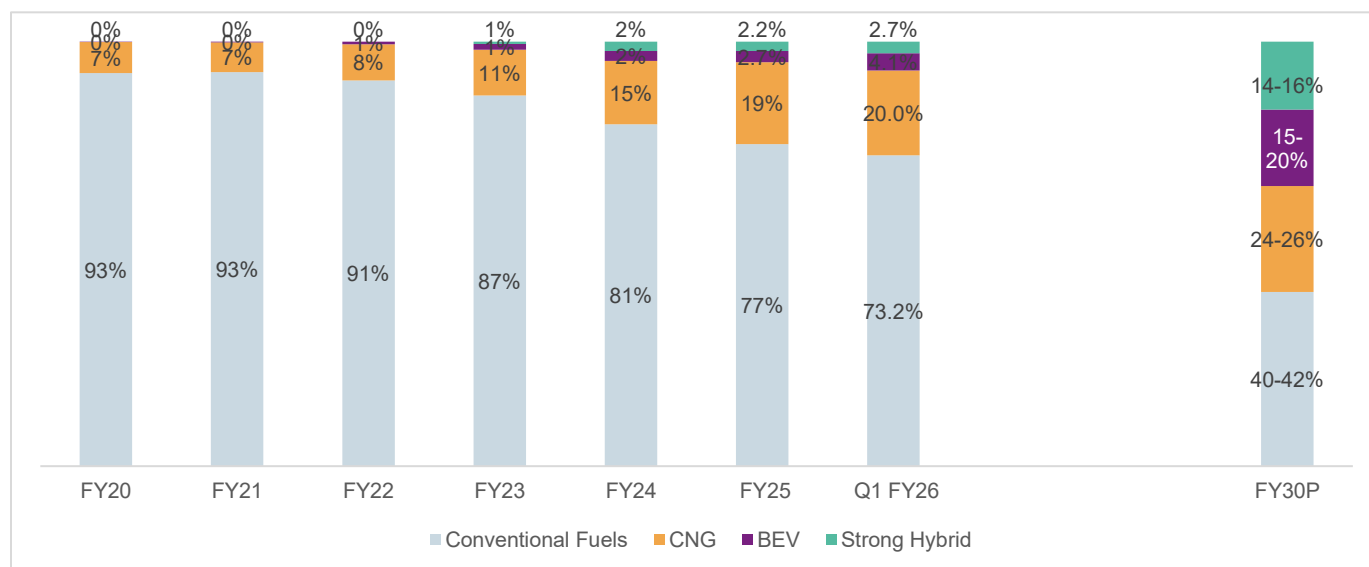
In fiscal 2025, the share of diesel powertrains in the retail industry slid to 18% and the share of petrol variants contributes 58% in fiscal 2025. A shift in OEM focus from conventional fuel such as Petrol and diesel to CNG vehicles is visible. Discontinuation of diesel models by a few OEMs such as Maruti with the onset of stricter BSVI norms, exacerbated the situation for diesel vehicles.

Indian domestic passenger vehicle industry, which was completely dominated by the conventional fuels, has witnessed fast acceptance of alternate fuels especially in the last 2-3 years. In fact, the share of CNG powertrain more than doubled to 19.4% in fiscal 2025, EV share rose to 2.7% and the latest addition, strong hybrids share reached 2.2%. The pace of growth continued for alternative fuel in Q1 fiscal 2026,

with EV share reaching 4.1% and strong hybrid reaching 2.7%, expanding their presence in the vehicle retails.

Going forward, CRISIL Intelligence expects the share of alternate fuel vehicles to witness a multi-fold growth while the conventional fuel vehicle's share will slide.

Powertrain-wise outlook of the industry



Note: Strong hybrid: Vehicles having a combustion engine as well as an electric motor. The vehicle can be powered by the engine or the battery, or by both simultaneously. The battery of the vehicle is charged by the combustion engine and not by an external power source. Telangana & Lakshadweep retail data is not available on VAHAN.

Source: VAHAN, CRISIL Intelligence

This has also led to expansion of the CNG vehicle portfolio by players, especially in premium segments like premium hatchbacks, compact SUVs and mid-size SUVs wherein they have announced future launches. This will lend further incentive to CNG buyers.

Electrification is another trend witnessed in the Indian domestic passenger vehicle market in the last 2/3 years. However, for EVs, range anxiety, limited charging infrastructure, import dependency on certain components, higher import duties and underdeveloped local supply chain are some of the bottlenecks.

The recent entry of strong hybrid vehicles such as Maruti Suzuki Grand Vitara, Maruti Suzuki Invicto, Toyota HyRyder, Toyota Hycross and Honda City have witnessed fast acceptance due to improved mileage, environmental benefits coupled with absence of EV concerns like range anxiety, limited charging infrastructure, etc. In the last 2 years, strong hybrid powertrains have grabbed 2% of the annual retail of the PV industry.

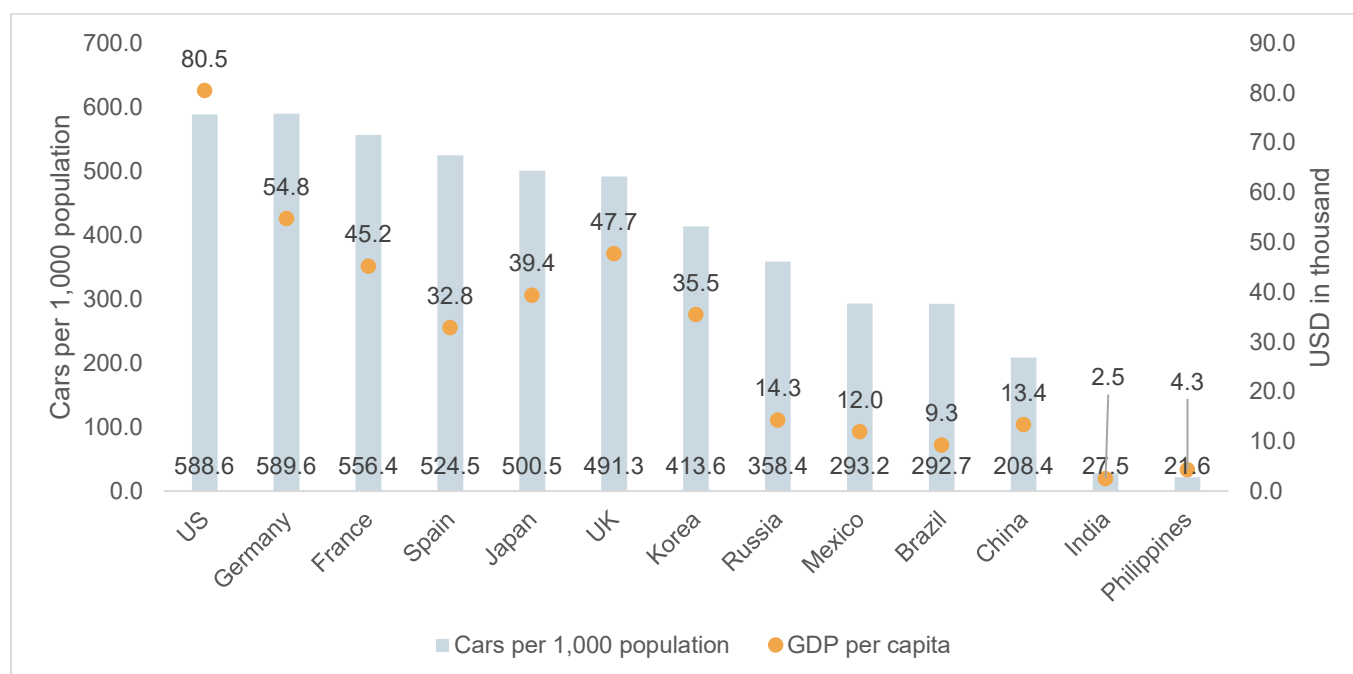
In the long-term horizon, CRISIL Intelligence projects higher traction for strong hybrids, further buoyed by attractive hybrid offerings, OEM focus, infrastructure availability and government support.

Key regulatory/macroeconomic trends and domestic sales growth drivers

Vehicle penetration in India

The Indian PV market is one of the fastest growing in the world and ranked second in terms of annual sales (after China) in 2023. However, Indian PV sector has historically seen significant periodic fluctuations in overall demand. The market is highly underpenetrated. According to CRISIL Intelligence, car penetration of 27.5 per 1,000 people in India as of fiscal 2025 was significantly lower than that of developed countries and even emerging economies such as Brazil, Russia, and Mexico, providing significant headroom for growth, especially given the expected increase in disposable income, faster economic growth, younger population, and increased focus of international OEMs. With penetration below the global average, India offers tremendous growth potential for automobile manufacturers.

Car penetration by country in 2023



Note: Data for CY 2023, India Data for FY25

Source: International Road Federation- World Road Statistics 2025, CRISIL Intelligence

Regulations/safety norms

Based on European emission standards, the Indian government has introduced and implemented Bharat Stage (BS) norms in a phased manner. These mandatory norms increase the capital expenditure of auto OEMs and in turn significantly impact the industry's profitability. Currently, India has adopted BS-VI norms.

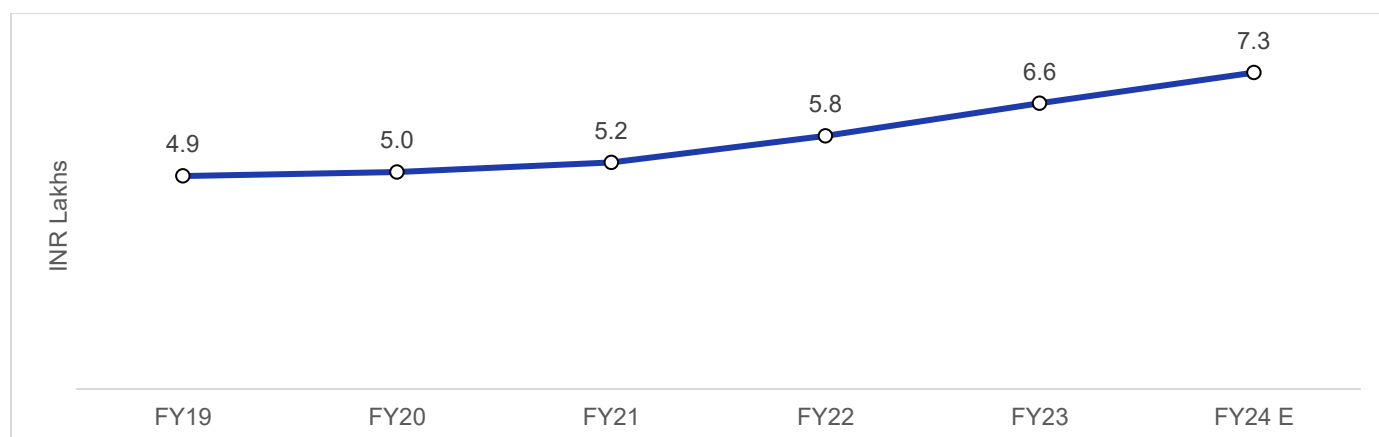
Companies have invested in the relevant technology, research, and development, and signed joint ventures (JVs) with global players to adhere to BS-VI stage 2 norms applicable from fiscal 2024, leading to price hikes across vehicle segments owing to the addition of new technologies to meet new emission regulations. Globally, countries are adopting stricter emission norms and zero-emission targets. India introduced BS VI in two stages, with Stage II mandating On-

Board Diagnostics (OBD) in 2023. Europe and the US are moving towards EURO-7 and US2027 norms for PV and CV segments. India's next leap, BS VII, is expected to be introduced, significantly raising the bar for emission control and driving the country towards cleaner mobility, aligning with global standards and supporting environmental goals. This move will curb emissions and help achieve emission targets, contributing to a more sustainable transportation ecosystem. new technologies to meet new emission regulations.

Premiumization trend

The average selling price (ASP) increased at a CAGR of 7-9% between fiscals 2019 and 2024 due to the premiumization trend as well as a sharp rise in vehicle prices. Consumers in India are opting for mid-end or top-end versions of vehicles and moving away from traditional fuel-efficient budget-friendly small cars to higher priced feature-loaded large cars, which offer more space, better ride height, seamless connectivity, and an improved performance. Further, there has been a major shift in customer preference with the launch of compact and mid-size SUVs. The share of small cars (hatchbacks) reduced from 46.9% in fiscal 2019 to 28% in fiscal 2024, majorly driven by a shift in consumer sentiment towards newly launched feature-rich vehicles in the SUV segment. Meanwhile, the share of SUVs increased from 23.1% in fiscal 2019 to over 51% in fiscal 2024. Increased spending of the upper middle class after the pandemic, a higher number of models launches in the category (which has higher profit margins), and an increase in affordability with the launch of compact SUVs led to cannibalization of the share of hatchbacks and compact sedans.

ASP trend of vehicles



Note: Based on OEM factory cost, ASP of FY24 is estimated as FY24 financials are not available for all OEMs as of 15th September 2024.

Source: CRISIL Intelligence

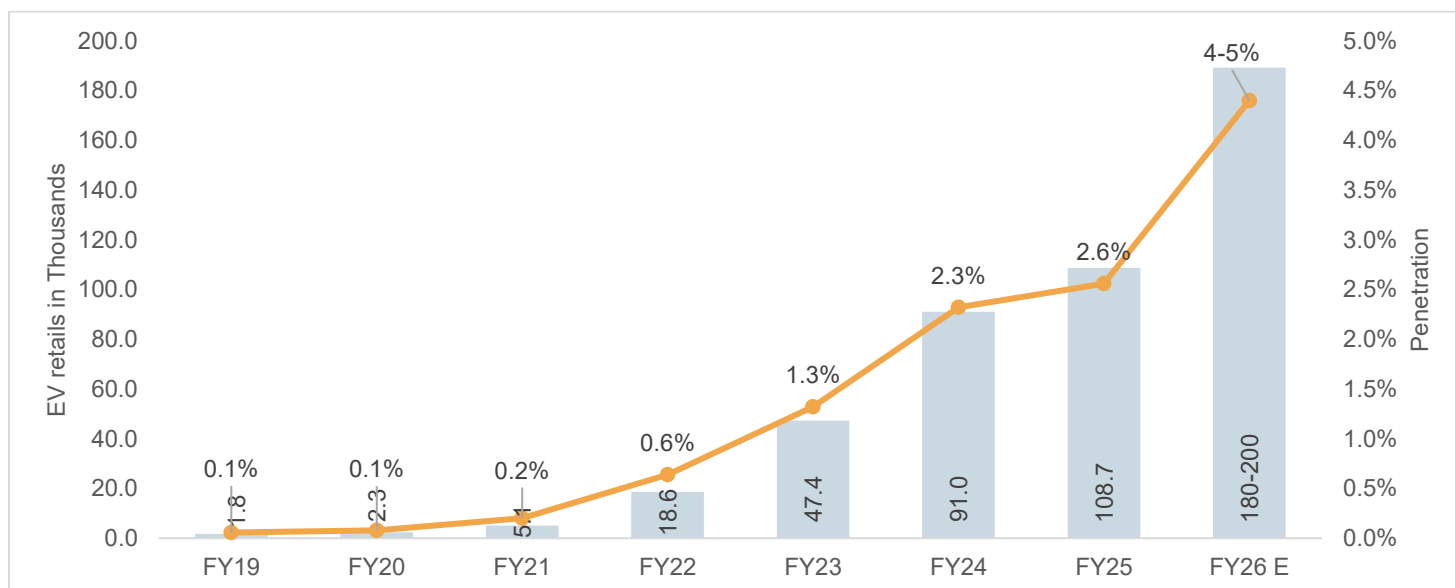
Evolving emission standards

Industry has witnessed a tightening of emission norms in line with global environmental objectives with landmark shift to BS VI norms in April 2020 marked a significant leap from BS IV, skipping an entire generation of standards, and aligning India closer to Euro VI norms. This transition required substantial investment in engine technology, after-treatment systems, and fuel quality upgrades, resulting in higher vehicle costs and increased content per vehicle (CPV). The upcoming Bharat Stage-VII norms are expected to be like the Euro 7 norms which is applicable across Europe and all on-road vehicle categories. OEMs are preparing for another wave of capital expenditure focused on advanced emission control technologies. While this raises affordability challenges, it also pushes the industry toward cleaner technologies, potentially accelerating the shift to zero or low emission vehicles.

EV penetration in PVs

EV penetration in the PV segment was insignificant till fiscal 2021 amid a limited vehicle portfolio, coupled with lower customer awareness. Fast expansion of the portfolio (from three models in fiscal 2019 to ~14 models in fiscal 2024), rising environmental awareness, government support and expanding EV infrastructure have led to a sharp rise in EV adoption. In turn, the penetration of EVs rose from 0.1% in fiscal 2019 to 2.6% by fiscal 2025. EV sales are to reach 180,000-200,000 units in fiscal 2026 with the penetration level projected to rise to 4-5%.

Domestic EV retail and penetration trend in PVs



Note: VAHAN figures exclude Telangana, Lakshadweep retails

Source: VAHAN, CRISIL Intelligence

However, electrification in the PV segment is still at a nascent stage and there is a significant scope for expansion.

Outlook of the domestic PV industry (fiscals 2025 to 2030P)

CRISIL Intelligence expects the macroeconomic scenario to support industry growth with GDP projected to grow at a healthy pace between fiscals 2025 and 2030. India's GDP growth is expected to outperform other major geographies over the next five years at 6-8%. Inflation levels are also expected to remain subdued in the 3-5% range, which is within the RBI's target band. CRISIL Intelligence has assumed three years of normal monsoons within the five-year outlook period and has considered positive momentum in rural demand. Fuel prices are also expected to remain almost steady in the next five years. These favorable macroeconomic factors are expected to support consumer disposable income.

Besides macroeconomic factors continued government support in terms of policies as well as continued expenditure and investments are expected to boost the industry. The favorable demographics are an added advantage for India and expected to help propel the PV industry.

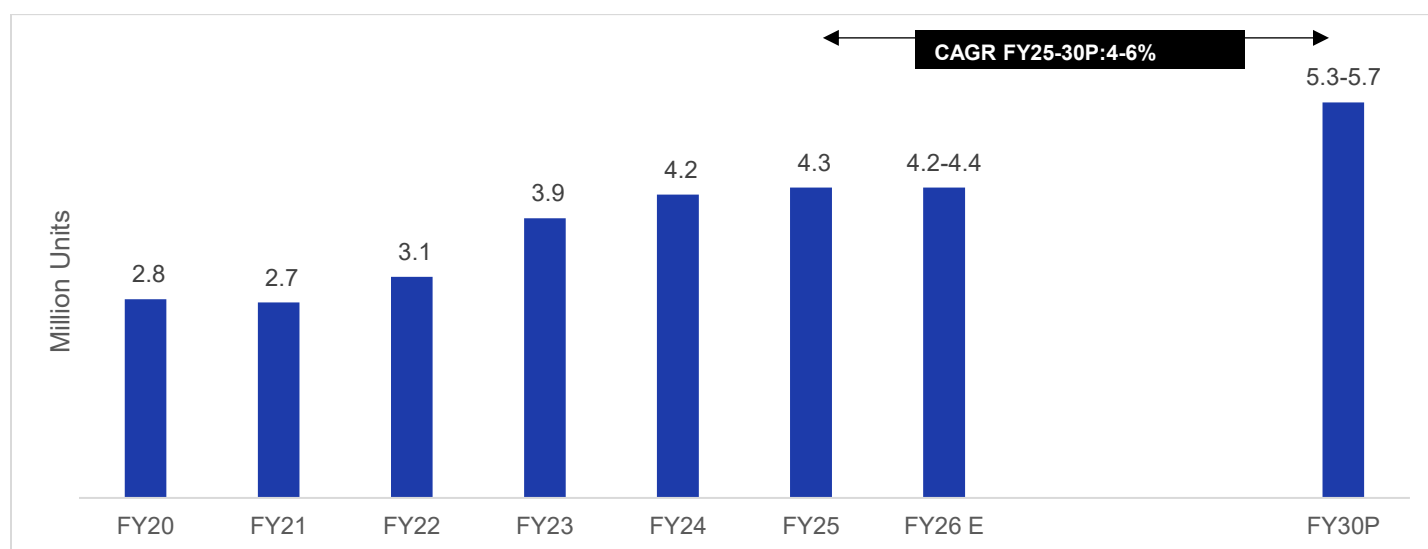
Additionally, OEMs are expected to continue to launch feature-rich competitively priced vehicles, aiding overall demand growth.

The financing scenario is projected to remain favorable for the industry and lend further support amid expanding financing reach and high loan to value (LTV) levels. Moreover, after multiple rate hikes in the past two years, a rate cut of 25-50 bps is expected to keep interest rates competitive in the near term. Given projections of subdued inflation levels in the long term, any further rate hike seems unlikely.

Changing market dynamics, including a younger consumer base, premiumization, electrification, shorter replacement cycles (four to five years currently visa-a-vis seven to eight years ago) will provide further impetus to demand. Additionally, the government's push for scrapping old vehicles (as per the government regulation vehicles above the age of 15 years will be compulsorily scrapped) is expected to shorten replacement cycles and support demand. Further, capacity expansion by players such as Maruti Suzuki, Hyundai, Tata Motors is expected to support growing vehicle demand. Moreover, expansion of supporting infrastructure such as EV charging stations and CNG pumps will also enhance the choice of customers in terms of powertrains.

CRISIL Intelligence expects domestic sales to grow at a 4-6% CAGR between fiscals 2025 and 2030 to reach 5.3-5.7 million vehicles.

Domestic PV industry outlook (By Volume)



Source: SIAM, CRISIL Intelligence

Segmental outlook

Domestic industry growth is expected to be led by UV (SUV and MPV) segment, while hatchback, sedan and van segments are expected to clock muted growth.

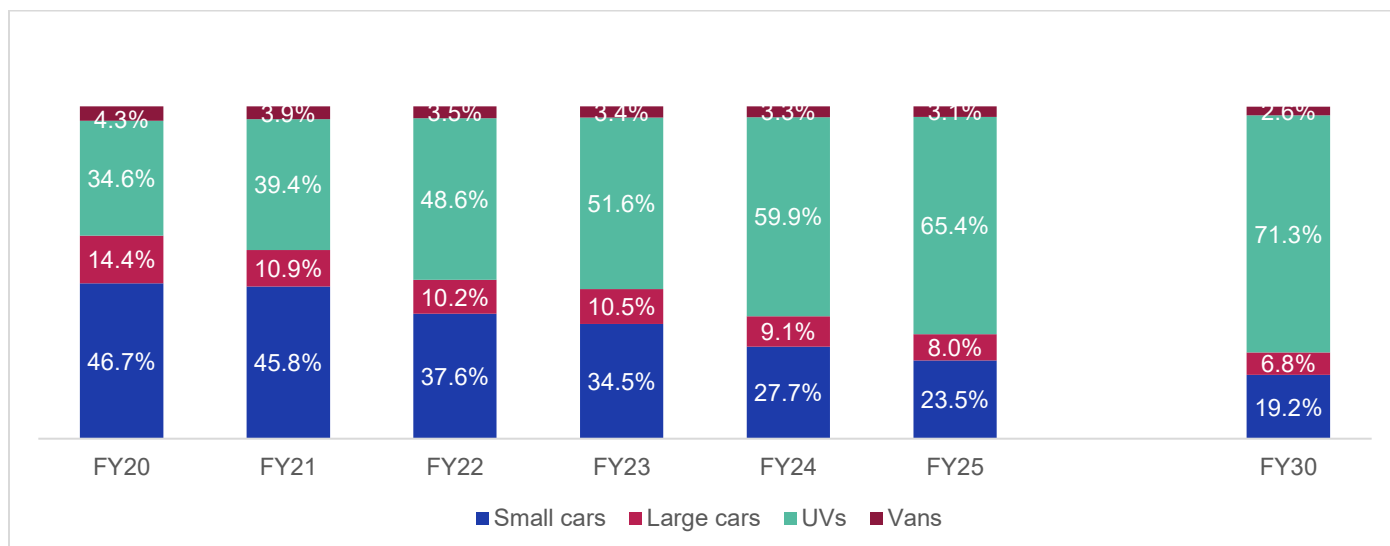
Segmental growth outlook

Segment	FY20-FY25 CAGR	FY25-FY30P CAGR
Hatchbacks	(4.7) %	0-2%
Sedans	(2.8) %	1-3%

Segment	FY20-FY25 CAGR	FY25-FY30P CAGR
UVs	25.5%	6-8%
Vans	2.8%	1-2%
Total	9.3%	4-6%

Source: SIAM, CRISIL Intelligence

Outlook by industry segment



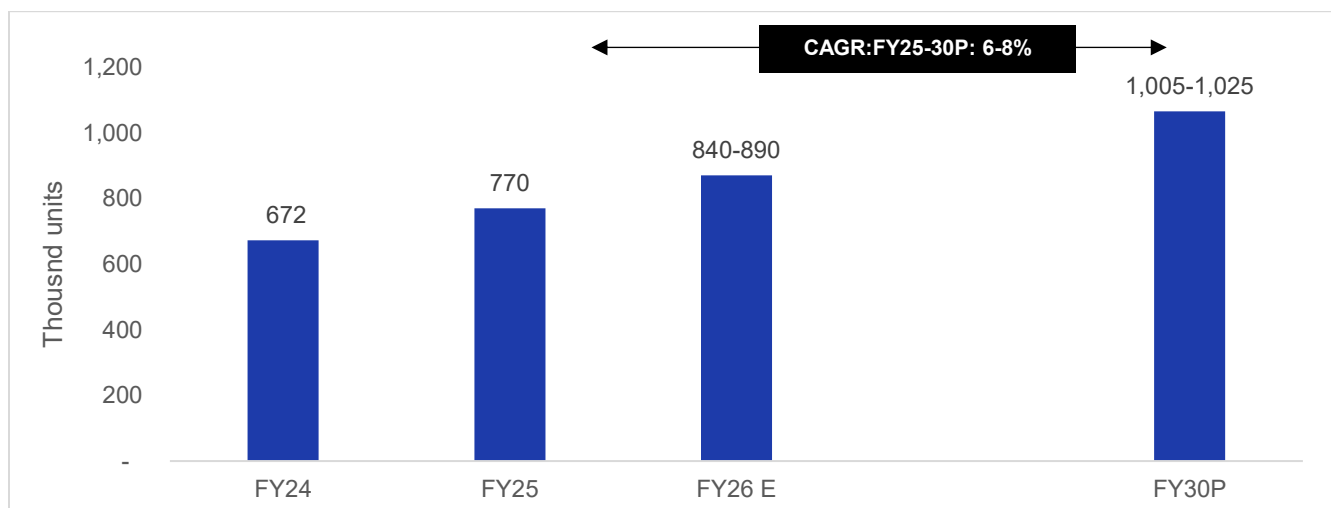
Source: SIAM, CRISIL Intelligence

PV export outlook for India

India's PV exports are projected to grow 6-8% CAGR between fiscal 2025 to fiscal 2030. A substantial growth of 12-14% is expected in fiscal 2026. This is supported by the sustained demand for Indian-made vehicles in international markets, particularly in emerging regions such as Latin America, Africa, and Southeast Asia, where there is a growing demand for affordable and reliable vehicles. Further competitively priced models, especially in the utility vehicle (UV) and premium sedan segment expected to drive the large car market.

A few years ago, India was a major export hub for cars such as hatchbacks and compact sedans. However, shift towards the UV segment along with higher variants and automatic transmissions has successfully transformed the industry becoming the large car exporter over past five to six years. OEMs are actively broadening their portfolios to cater to changing consumer preferences in both domestic as well as global markets. Further, premium sedans such as Hyundai Verna and Volkswagen Virtus are key models driving the large car market.

Outlook for exports (fiscals 2025-2030P)



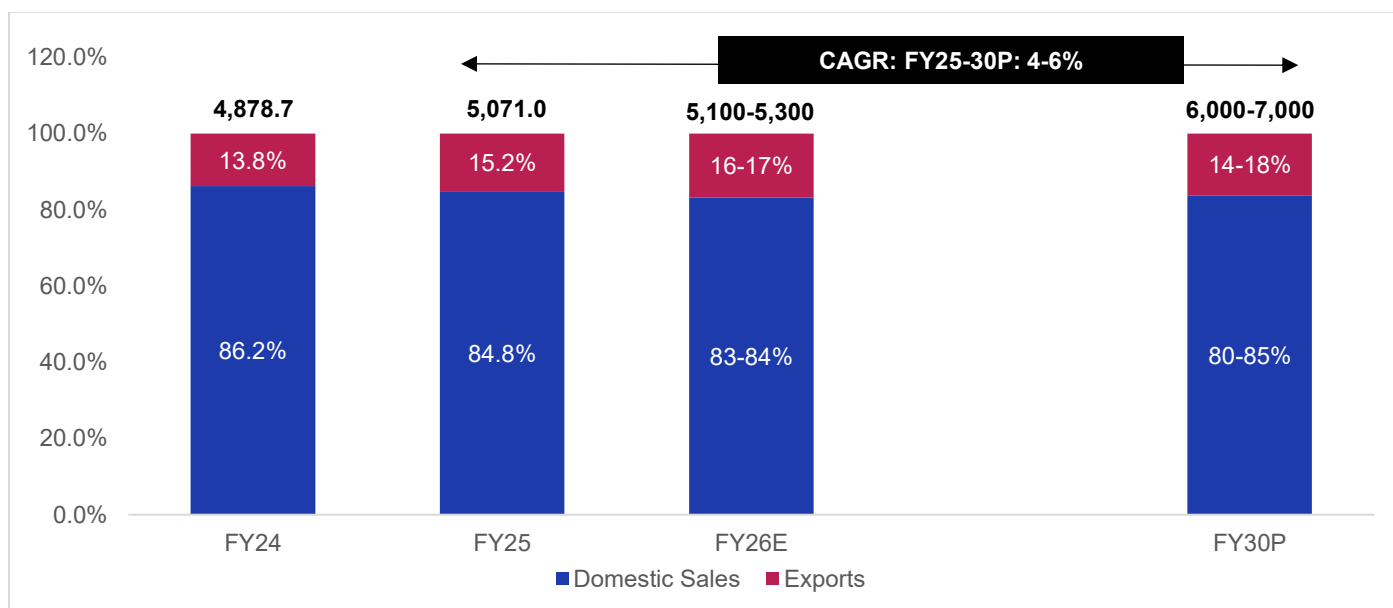
Note: E-Estimates and P-Projected

Source: CRISIL Intelligence

Overall PV industry growth: Outlook for domestic sales and exports

Domestic sales, which accounted for 84.8% of overall industry sales in fiscal 2025, are expected to grow at a 4-6% CAGR between fiscals 2025 and fiscal 2030, exports are expected to grow at 6-8% CAGR during the same period.

Overall PV industry outlook for domestic sales and exports (fiscals 2025-2030P)



Note: E-Estimates and P-Projected

Source: CRISIL Intelligence

Key regulatory trends related to emission norms and trends related to clean air

There have been various emission norms to regulate air pollutants from vehicles. The Bharat stage emission standard (BSES) by the government of India, set limits for pollutants emitted by vehicles.

Key emission Norms-

The Bharat Stage (BS) norms in India are emission standards instituted by the government to regulate the output of air pollutants from internal combustion engine equipment, including motor vehicles. These norms are designed to improve air quality by reducing vehicle emissions and are aligned with the European emission standards. The implementation of BS6 Stage 2 norms, effect from April 2023, will have significant impacts on passenger vehicles in India.

Here's a concise overview of these effects.

- Real Driving Emissions (RDE): Mandatory testing to ensure vehicles meet emission standards in real-world driving conditions.
- Enhanced On-Board Diagnostics (OBD 2): Advanced OBD systems to monitor real-time emissions and ensure ongoing compliance.
- Stricter Emission Limits: Tighter limits for pollutants like NOx, PM, HC, and CO.

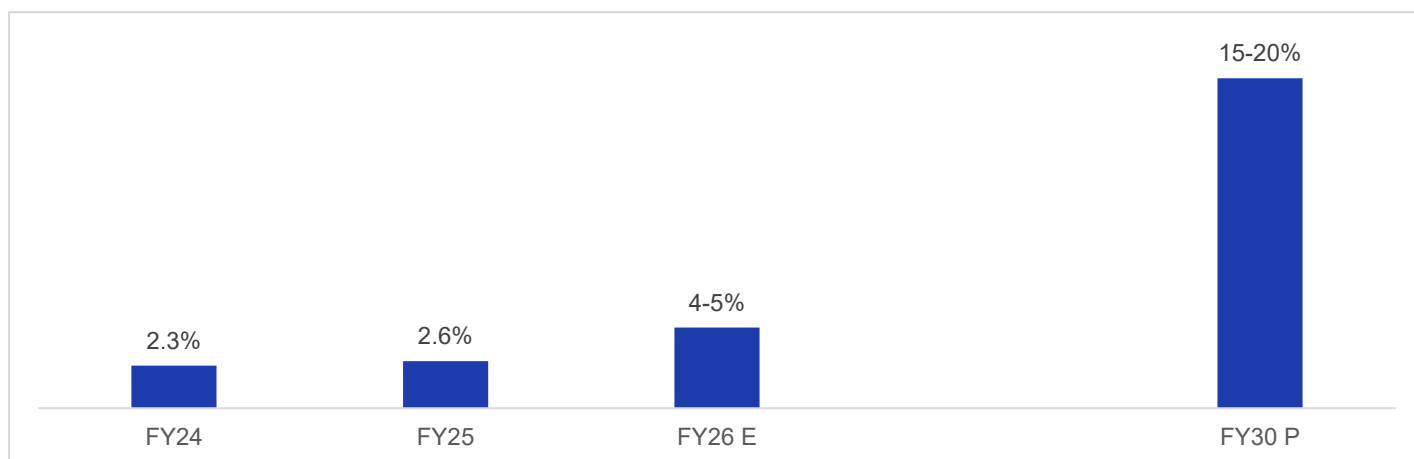
India promotes alternative fuels like compressed natural gas (CNG), liquified petroleum gas (LPG) and biodiesel to reduce emissions.

Estimated penetration of electric PVs by segment by fiscal 2030P

The FAME-II subsidy is skewed towards vehicles for commercial use. No benefits are provided to personal car owners.

CRISIL Intelligence expects the share of EVs in total passenger car sales to grow to 15-20% in fiscal 2030 from 2.6% in fiscal 2025. Further, the share of EVs expected to rise 4-5% in fiscal 2026. The growth in penetration is expected to be supported by new launches, with 11 new models expected in fiscal 2026. This would drive more choices for consumer basis on price point and segments.

EV penetration outlook for PVs



Source: CRISIL Intelligence

Review and outlook of Commercial Trucks Industry (> 3.5 to 55 tons)

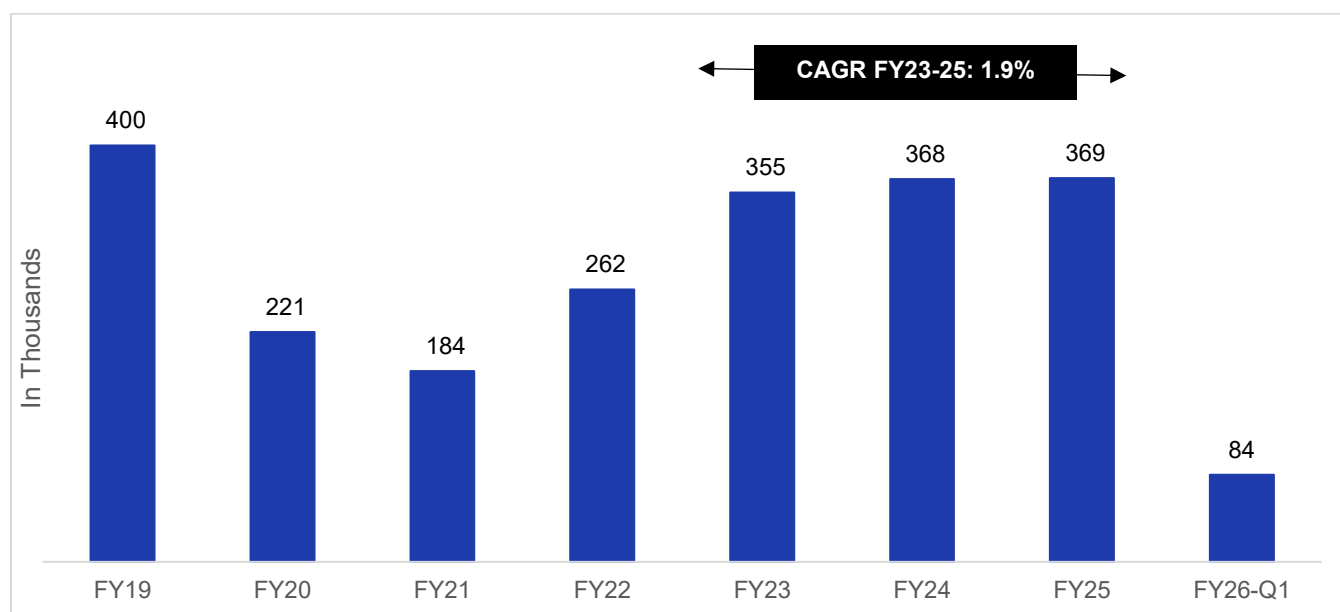
Review of domestic Commercial Trucks industry

The domestic CT industry witnessed significant fluctuations in sales volumes over the past few years, influenced by economic cycles, regulatory changes, and external disruptions.

In fiscal 2019, CT sales peaked at approximately 400 thousand units, supported by strong economic activity and government investment in infrastructure development. However, the industry faced a sharp downturn in fiscal 2021, with volumes dropping to 184 thousand units due to sluggish demand and pandemic induced disruptions. With the gradual recovery of economic activity, fiscal 2022 saw a moderate revival, as sales increased to 262 thousand units, supported by pent-up replacement demand and improved freight rates. This momentum accelerated in fiscal 2023, when the industry recorded a remarkable rebound to 355 thousand units, nearly reaching pre-pandemic levels. The surge was driven by improved transporter profitability, rising industrial output, and fleet expansion.

Fiscal 2024 continued this positive trajectory, marginally surpassing the previous year with 368 thousand units sold, benefiting from sustained demand and government led infrastructure projects. Trend in fiscal 2025 signals marginal growth with sales surpassing 369 thousand units. This can be attributed to subdued economic activity, cautious fleet expansion, and reduced construction spending.

Review of domestic CTs industry, fiscal 2019-2026 Q1 (in volume terms of sales)



Note: LCV segment excludes less than <=3.5 tonnage category

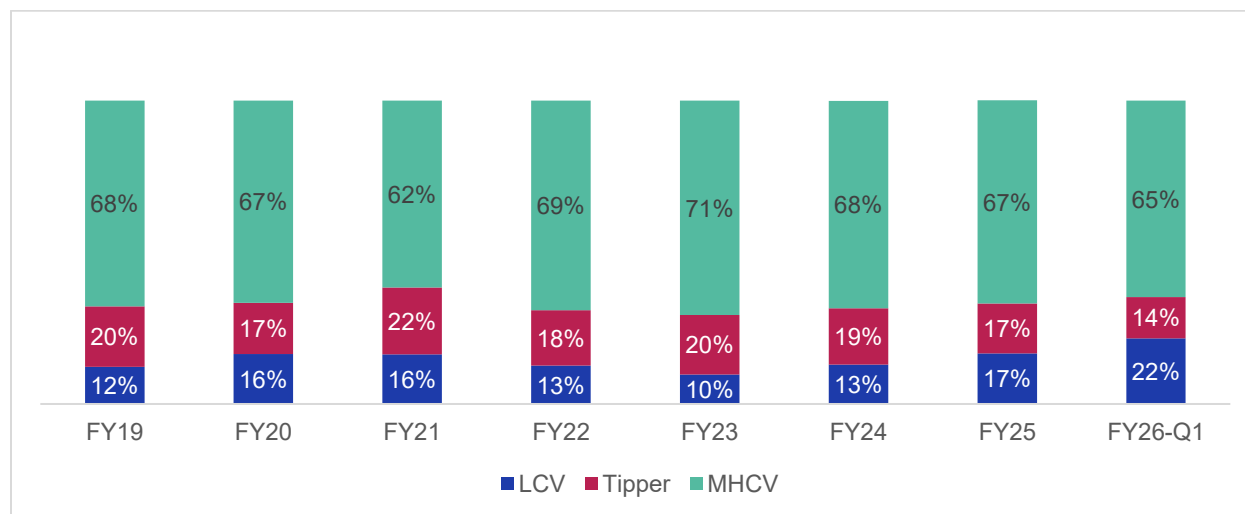
Source: SIAM, CRISIL Intelligence

Segmental Trends

The domestic CTs industry has undergone significant segmental shifts over the years, shaped by economic cycles, policy changes, and market dynamics. Fiscal 2019 saw peak industry volumes at 400 thousand units, with a balanced

contribution from Light Commercial Vehicles (LCVs), Tippers, and Medium & Heavy Commercial Vehicles (MHCVs). However, subsequent years witnessed substantial variations in segment-wise market share due to changing demand patterns, regulatory shifts, and macroeconomic conditions.

Segment-wise share in domestic wholesale industry



Note:

1. LCV segment excludes less than <=3.5 tonnage category.
2. Tipper includes only MAV and LCV tippers.

Source: SIAM, CRISIL Intelligence

Note: All percentages have been rounded off.

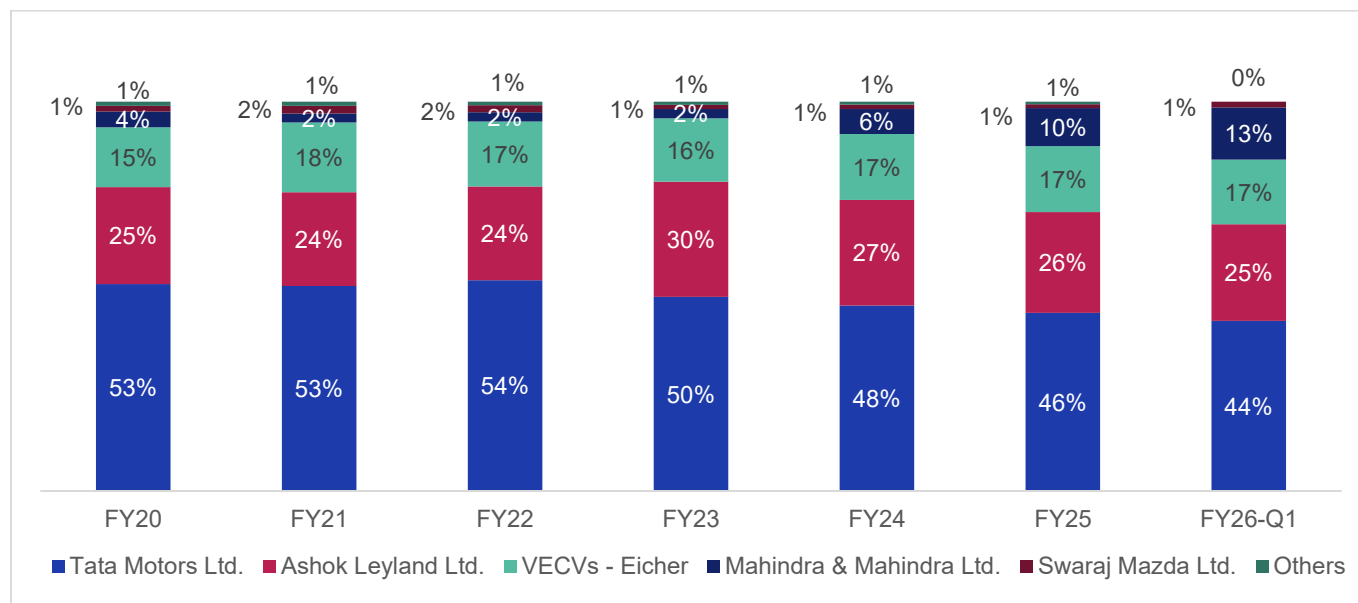
LCV segment, which excludes less than 3.5 tonnes had a share of 12% in FY19 and have largely remained rangebound. After witnessing a surge between the years FY20 and FY22, the segmental share reached 13% in FY2024 and increased to 17% in FY2025.

MHCV segment, primarily comprising heavy-duty trucks, has exhibited a relatively stable trajectory in recent years. MHCVs commanded a dominant 68% share in FY19, reflecting strong industrial and infrastructure-driven demand. This gradually moderated to 67% in FY20 and further dropped to 62% in FY21 amid an economic downturn, constrained freight demand, and financing bottlenecks that delayed fleet replacement. As economic conditions improved and infrastructure projects resumed, MHCV penetration surged to 69% in FY22 and peaked at 71% in FY23, underscoring a sharp recovery led by renewed construction activity and increased logistics movements. In FY24, MHCV share eased slightly to 68% and remained steady at 67% in FY25, reflecting a normalization phase. This indicates sustained underlying demand despite transitional pressures such as softer industrial output and uncertainty around policy continuity in an election year.

Tippers, a specialized sub-segment catering to construction, mining, and infrastructure applications, accounted for 20% of CV sales in FY19. The share moderated to 17% in FY20 and rose to 22% in FY21, benefiting from a low base and delayed infrastructure projects. However, subsequent years saw a rationalization of demand, with penetration declining to 18% in FY22, followed by a rebound to 20% in FY23. In FY24, the tipper segment accounted for 19% of total volumes and further moderated to 17% in FY25. This fluctuation suggests sensitivity to public and private investment cycles. Despite intermittent slowdowns, the segment continues to exhibit resilience, supported by steady execution of road, mining, and rural infrastructure projects.

Player wise Trend

Competitive landscape in CTs has evolved due to changing customer preferences, regulatory transitions, and increasing penetration of alternative fuel technologies.



Note:

1. LCV segment excludes less than <=3.5 tonnage.
2. Player-wise share before FY20 is unavailable due to differing segment-level bifurcations.

Source: SIAM, CRISIL Intelligence

Note: All percentages have been rounded off

Growth Drivers for CTs in India

Increasing freight rates to aid in materialization of deferred demand

In fiscal year 2025, fuel prices constituted approximately 55% of transporter costs, exerting a considerable influence on their overall profitability. During this period, diesel prices remained stable. Concurrently, freight rates also rose by an estimated 12%, signalling improved transporter profitability and heightened demand for freight services. These favourable factors are expected to boost Commercial Vehicle (CV) sales, as the industry capitalizes on the increased demand in the transportation sectors.

Easier Financing Options Enhancing Truck Sales Momentum

Access to vehicle financing has improved notably over the past few years, driven by increased participation from banks, NBFCs, and captive financing arms of OEMs. Financial institutions have started offering customized loan products with longer repayment tenures, lower EMIs, and flexible down payment structures. The government's initiatives to formalize small fleet operators and improve their creditworthiness through digital lending platforms and GST-linked profiling have also enhanced access to credit. As a result, first-time buyers and small fleet owners are finding it easier to purchase CV, thereby supporting demand growth in the sector.

Stable agricultural output

Over fiscal 2025 to 2030, CRISIL projects 3-4% gross value added (GVA) growth in agriculture. In fiscal 2024, Agri GVA grew at 2% over last year and expected to remain steady in coming years.

In the current fiscal, kharif sowing was initially delayed due to the delayed monsoon. However, sowing has picked up in recent months. Moreover, higher MSP allocation for fiscal 2024 and good prices in mandis have maintained the positivity on-ground. Going ahead, the rainfall progress and spread to play a key role for the current kharif cycle. The progress of the monsoon and its impact on rural demand especially for two wheelers and tractors, remain as key monitorable.

Healthy industrial growth

The Indian industry's gross value added (GVA) had been growing rapidly, in line with the GDP averaging ~averaging around 6% between fiscals 2020 and 2025. After consecutive weak fiscals of 2020 and 2021 due to the COVID-19 outbreak, industrial GVA is estimated to have grown by approximately 6.4% on-year in fiscal 2025. Over the next five-year period (fiscal 2025-2030), industry GVA is expected to be robust driven by the government's focus on 'Make in India' with the stated aim of the government to push up the share of Manufacturing in India's GDP from 17% to 25%. Moreover, improvement in infrastructure and higher expected corporate expenditure is likely to support the capex cycle going forward post-fiscal 2024. India's ambitious infrastructure development plans, including the Bharatmala Pariyojana and Sagarmala programs, are expected to drive commercial vehicle demand during fiscal 2025 to fiscal 2030, as the resulting increase in construction and logistics activities boosts demand for heavy and medium commercial vehicles.

Government's focus on infrastructure

The National Infrastructure Pipeline (NIP) for fiscal 2019-2025 is a government initiative to develop infrastructure across the country and provide world class services to its citizens. The total capital expenditure in infrastructure sectors in India during fiscal 2020 to 2025 is projected at Rs 111 lakh crore.

Almost 83% of project allocation indirectly benefits the CV sector in India, and this push for infrastructure is a major driver of growth.

Focus on infrastructure and higher mining production to bolster tipper demand

Over the next five-year period (fiscal 2025-2030), industry GVA is expected to be robust driven by the government's focus on 'Make in India' with the stated aim of the government to push up the share of Manufacturing in India's GDP from 17% to 25%. Moreover, improvement in infrastructure and higher expected corporate expenditure is likely to support the capex cycle going forward post-fiscal 2024. India's ambitious infrastructure development plans, including the Bharatmala Pariyojana and Sagarmala programs, are expected to drive commercial vehicle demand during fiscal 2025 to fiscal 2030, as the resulting increase in construction and logistics activities boosts demand for heavy and medium commercial vehicles. The budgeted capex allocation for infrastructure ministries for fiscal 2024 has shown a 28% increase over fiscal 2023 RE (revised estimates) to Rs. 18.6 lakh crore. Execution by the National Highways Authority of India (NHAI) will reach up to ~14-15 km/day in fiscal 2027, as against ~11 km/day in fiscal 2021, aided by the Bharatmala project. Projects such as Sagarmala and investments in various irrigation projects will further drive MHCV demand. We expect coal production to expand at ~4.5-5.5% CAGR between fiscals 2024 and 2029, while iron ore mining will also likely grow at ~3.5-4.5% CAGR during this period, aiding tipper demand.

Replacement demand

The replacement cycle of LCVs, which are typically replaced every 6-8 years, has been impacted by the pandemic and the subsequent materialization of delayed replacements in fiscals 2023-2025. As a result, fiscal 2026 is expected to see a lower growth in the sub one tonne segment. However, the pickup and ULCV segments are expected to drive the growth of the LCV segment, supported by positive rural sentiments and a shift towards higher tonnage vehicles.

JNNURM – I (Jawaharlal Nehru National Urban Renewal Mission) buses, sold during the peak seasons of fiscals 2011 and 2012, are expected to be replaced once funds are released by the central and state governments for purchase. This replacement is expected to gain pace now, aiding long-term MCV bus growth. The government's mandate to replace private vehicles (such as vans) with school buses in some cities, is also expected to augur well.

Also, the centre's scrappage policy is likely to attract 6,00,000-6,50,000 MHCV vehicles for scrapping there by driving the replacement demand.

Scrappage policy

MoRTH, in August 2018, considered incentivizing the scrapping of vehicles sold before April 2005 (15 years old). After deliberations on the modalities on implementation of the norm, the government currently aims to promote vehicle scrapping by exempting registration charges for truck purchases made after scrapping older trucks. To incentivize scrappage of older vehicles, the government has increased the registration charges for older vehicles and increased stringency of fitness tests. These will entail higher costs for owners of older vehicles. Hence, by disincentivizing the ownership of older vehicles, the government expects the scrappage of older vehicles to increase. We expect the impact of the norms to be limited on additional scrappage (apart from vehicles scrapped in the normal course of business). If, through higher incentives from the government and OEMs, transporters are able to be incentivized to scrap vehicles older than 15 years, we expect 6,00,000-6,50,000 MHCVs to be available for scrapping. Although translation of the same into demand for new CVs will be a monitorable based on implementation and incentivization levels.

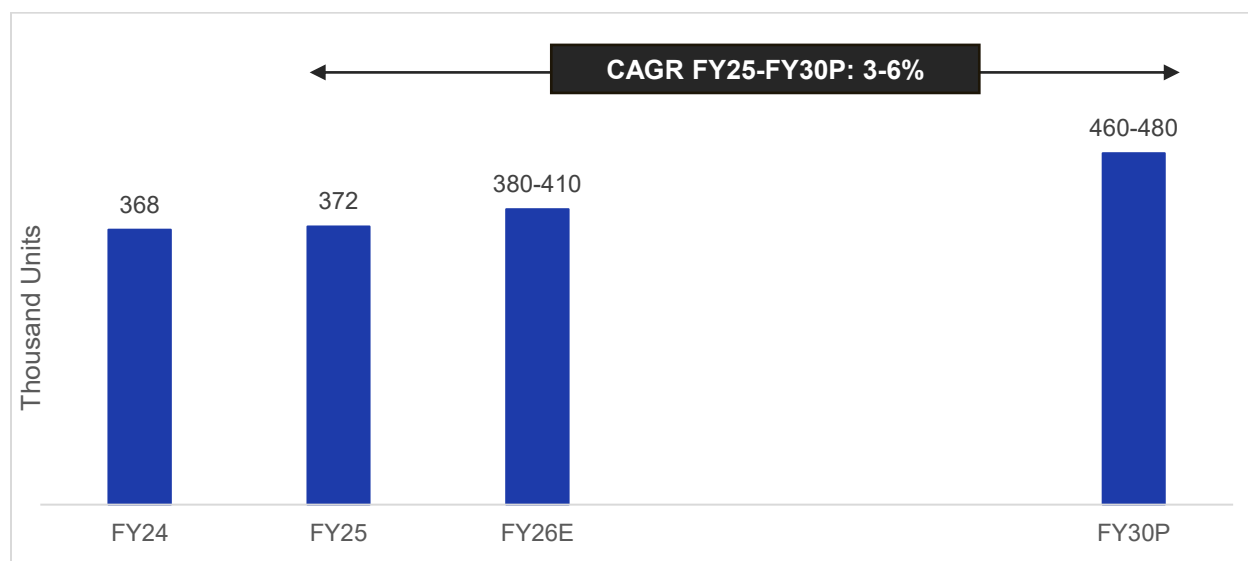
Outlook of the Indian CTs industry

CT industry, encompassing Light Commercial Vehicles (LCV), Medium and Heavy Commercial Vehicles (MHCV), and Tippers, has witnessed a fluctuating yet resilient performance in recent years. Fiscal 2023 marked a strong recovery, driven by robust replacement demand, infrastructure development, and increased government spending. However, fiscal 2024 growth has moderated, reflecting the impact of economic headwinds and supply-side challenges.

The segmental dynamics of the CTs industry highlight a transition toward a more balanced fleet mix, with LCVs stabilizing, MHCVs recovering, and tippers maintaining steady demand. The sustained push for infrastructure development, increased logistics digitization, and policy-driven fleet modernization is expected to shape the segment-wise trends in the coming years. Looking ahead, the CT industry is expected to record a steady growth trajectory with a projected CAGR of 3-5% from FY25 to FY30. Fiscal 2025 witnessed a marginal slowdown, particularly in MHCVs and Tippers, due to short-term economic uncertainties. However, LCVs remained resilient, backed by continued infrastructure momentum.

CT domestic sales outlook

Looking ahead, the commercial truck industry is expected to record a steady growth trajectory with a projected CAGR of 3-5% from FY25 to FY30.



P: Projected; E: Estimated

Source: SIAM, CRISIL Intelligence

Medium & Heavy Commercial Vehicles (MHCV) Set to Thrive in the Coming Five Years

The MHCV industry is expected to grow, with a compound annual growth rate (CAGR) of approximately 4-6% projected from fiscal year 2025 to fiscal year 2030.

Long-term MHCV sales are likely to be driven by several factors, including the country's improving industrial activity, consistent agricultural output, and the government's continued emphasis on infrastructure development. Additionally, fluctuations in commodity prices, interest rates, and availability of financing can affect demand. However, volume growth may be limited due to efficiencies gained from the implementation of the Goods and Services Tax (GST), the development of improved road infrastructure, and the commissioning of the dedicated goods corridor (DFC). Nonetheless, the industry remains on a promising growth trajectory in the coming years. Over the next five-year period (fiscal 2025-2030), industry GVA is expected to be robust driven by the government's focus on 'Make in India' with the stated aim of the government to push up the share of Manufacturing in India's GDP from 17% to 25%. Moreover, improvement in infrastructure and higher expected corporate expenditure is likely to support the capex cycle going forward post-fiscal 2024. India's ambitious infrastructure development plans, including the Bharatmala Pariyojana and Sagarmala programs, are expected to drive commercial vehicle demand during fiscal 2025 to fiscal 2030, as the resulting increase in construction and logistics activities boosts demand for heavy and medium commercial vehicles.

LCV sales to grow at a modest pace in the long run.

Light commercial vehicle (LCV) demand is expected to grow at a 3-5% CAGR from fiscal 2025 to 2030, owing to increased private consumption, lower penetration, increased availability of redistribution goods, and improved financing. The industry grew at a 3% CAGR between fiscal 2020 and 2025.

Upper-end light commercial vehicles (ULCVs) provide lower returns to the transporter than ICVs and are best suited for captive use. Entry restrictions on ICV trucks and higher tonnage MHCVs are expected to keep demand from this segment buoyant. However, the higher toll on ULCV trucks versus pickups will limit segment growth.

Review and outlook for electrification in CTs (fiscal 2018- 2030P)

Electrification in CTs

The Indian government has launched a scheme to provide financial incentives for electric trucks (e-trucks) under the PM E-DRIVE initiative, aiming to accelerate the country's transition to clean and sustainable freight mobility. The scheme, guided by Prime Minister Narendra Modi, will offer incentives of up to ₹9.6 lakh per vehicle for N2 (includes trucks with a Gross Vehicle Weight (GVW) above 3.5 tonnes and up to 12 tonnes) and N3 category (covers trucks with GVW exceeding 12 tonnes and up to 55 tonnes) electric trucks, with a focus on promoting affordability and reducing emissions. The initiative is expected to support the deployment of approximately 5,600 e-trucks, with key sectors such as cement, ports, and logistics set to benefit. The scheme also mandates the scrapping of old, polluting trucks and requires manufacturer-backed warranties to ensure reliability and performance.

Looking ahead, the future of electric CTs in India will likely begin with short-haul and urban freight applications, with fleet operators and government-backed logistics pilots paving the way. As battery densities improve and charging infrastructure expands under the National Electric Highway program and NITI Aayog's mobility roadmap, medium and heavy electric trucks may see broader acceptance, especially in closed-loop logistics and green freight corridors. Also, the roll out of e-Truck incentives through PM E-DRIVE is expected to give a further thrust to truck electrification. According to PIB, the is aimed at promoting affordability and the incentive amount will depend on the GVW of the electric truck, with the maximum incentive set at Rs 9.6 lakh per vehicle. The scheme is expected to support the deployment of approximately 5,600 e-trucks across the country.

Electrification in HCV goods vehicles

EV adoption in the HCV segment is expected to be negligible in the near future as operational profile makes them highly expensive. Further, the current charging infrastructure is not suitable for larger HCV batteries, which will make electric adoption unviable for the near future.

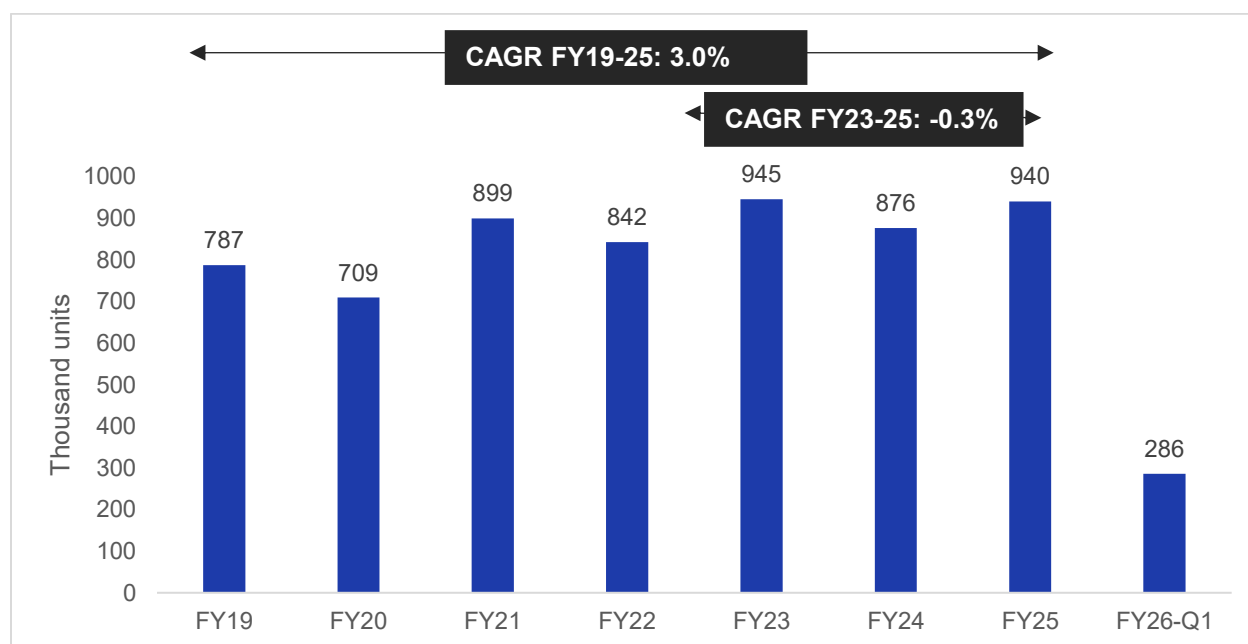
Review and outlook of Indian tractor industry

Review of Indian tractor industry

In fiscal 2022, domestic tractor demand dropped 6.4% on-year after growing 26.6% in fiscal 2021. Price hikes by OEMs, higher inventory at dealerships, lower commercial demand, negative farmer sentiment owing to rising cost of cultivation, low fertiliser availability and increase in other expenditure (such as marriages and other social occasions) hampered the demand.

In fiscal 2023, tractor sales grew 12.2% on-year to an all-time high of ~945,000 units. Healthy crop prices, sound reservoir levels owing to above-normal monsoon, higher MSPs announced by the government and better rabi acreage, all led to positive farmer sentiment. Healthy festival demand because of various schemes and discounts supported the retail growth momentum. Commercial demand during the fiscal, however, remained rangebound in fiscal 2023 owing to slower retail momentum in eastern states and a complete ban on sandmining.

Domestic tractor industry logged 3% CAGR between fiscals 2019 and 2025



Source: TMA, CRISIL Intelligence

In fiscal 2024, domestic tractor sales dropped by 7.4% on-year to ~875,724 units, on account of lower reservoir levels and negative farmer sentiments. Uneven rainfall distribution with monsoon being 6% below normal for the season has led to slower pick-up in the retail market. Erratic monsoon, lower reservoir levels, decline in rabi acreage contributed towards a 7.4% on-year decline in tractor sales for fiscal 2024.

A large part of domestic tractor sales is driven by replacement demand. The typical holding period for a tractor is 6-9 years. Most of the tractors in the country is replaced within 7-8 years. Of the domestic demand, 50-60% constitute replacement demand.

In fiscal 2025, with an above normal monsoon season aiding farmer sentiments, the domestic tractor sales rose by 7-8% in the fiscal 2025 after declining in fiscal 2024. The growth revival majorly supported by favorable rainfall boosted kharif crop output, with higher reservoir levels aiding rabi crop profitability which further supported sales. Government measures, including increased crop procurement and higher minimum support prices (MSP) for the rabi season, have boosted farmers' cash flow thereby leading to healthy retail momentum.

Factors impacting tractor industry

Emission norms

From January 2023, TREM IV was introduced for tractors above 50HP, aligning with Bharat Stage (BS) IV norms for off-road vehicles marked a significant regulatory shift aimed at curbing emissions from the agricultural sector. With application of TREM IV, the price of more than 51 hp tractors has gone up by Rs 1-1.5 lacs further dampening demand with farmers shifting towards 41-50 hp tractors. For this reason, share of >51 hp tractors had gone down in fiscal 2024.

Implementation of the TREM V emission norms, which are set to take effect from April 1, 2026, could influence buying patterns, potentially leading to pre-buying ahead of the deadline as farmers and dealers look to purchase tractors before price increases. However, the final impact will depend on clarity around regulatory timelines, OEM preparedness, and cost implications for end-users.

EV penetration

Adoption of electric tractors in India remains at a nascent stage, with limited penetration in broader market. Until FY2019, electric tractors in India were few and largely imported from international markets. However, a shift began in FY2020, when domestic manufacturers started investing in the development and production of electric models.

Leading traditional tractor OEMs like Mahindra, Escorts Kubota, and Sonalika (International Tractors Ltd) have since initiated R&D and rolled out their first few prototypes electric tractors. In parallel, dedicated EV startups such as AutoNxt Automation, Bull Work Mobility, and Powerland Agro have focused exclusively on electric tractor development, targeting niche applications.

Despite this growing interest, cumulative registrations of electric tractors in India remain low-just 127 units to date including both imported units and domestically produced prototypes. Deployment has primarily been concentrated in a few agriculturally intensive states like Haryana and Punjab, where state-level support and targeted trials have facilitated early experimentation.

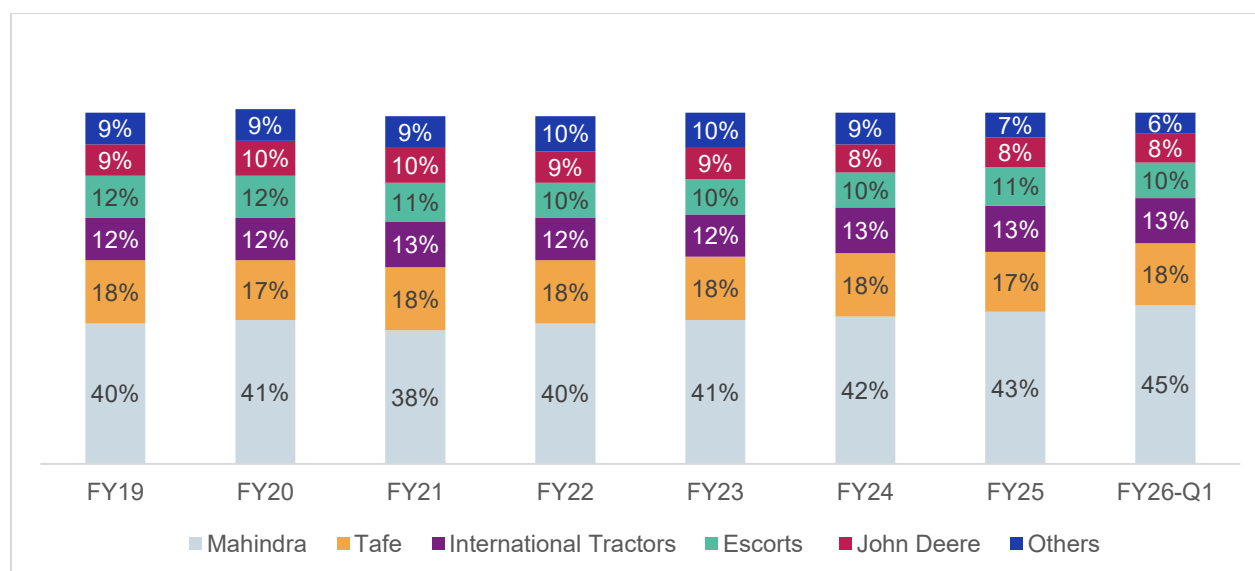
Companies are currently engaging in pilot testing with select customers to evaluate real-world performance, collect user feedback, and optimize design before considering broader commercial rollout. While these steps mark important progress, the current electric tractor volumes are minuscule when compared to the overall Indian tractor market, which sells over 900,000 units annually.

Demand drivers

Tractor demand in the country is mainly dependent on farmer incomes from agricultural operations, which, in turn, gets impacted by various factors such as monsoon, crop prices, government procurement, etc. The government regulation governing rural infrastructure development also affects non-farm tractor demand, which accounts for roughly 20-25% of overall domestic demand for the vehicles. Additionally, availability of formal financing channels also supports the demand.

Competition

Player-wise domestic market share (volume-wise): M&M gained significant market share in FY25



Source: CRISIL Intelligence

Going forward, CRISIL Intelligence expects the competition in the industry to intensify further. However, the top five players will continue to account for 85-90% of the industry by volume. A strong distribution network, brand recall, captive financiers and diverse product range are critical to maintain market position in the tractor industry.

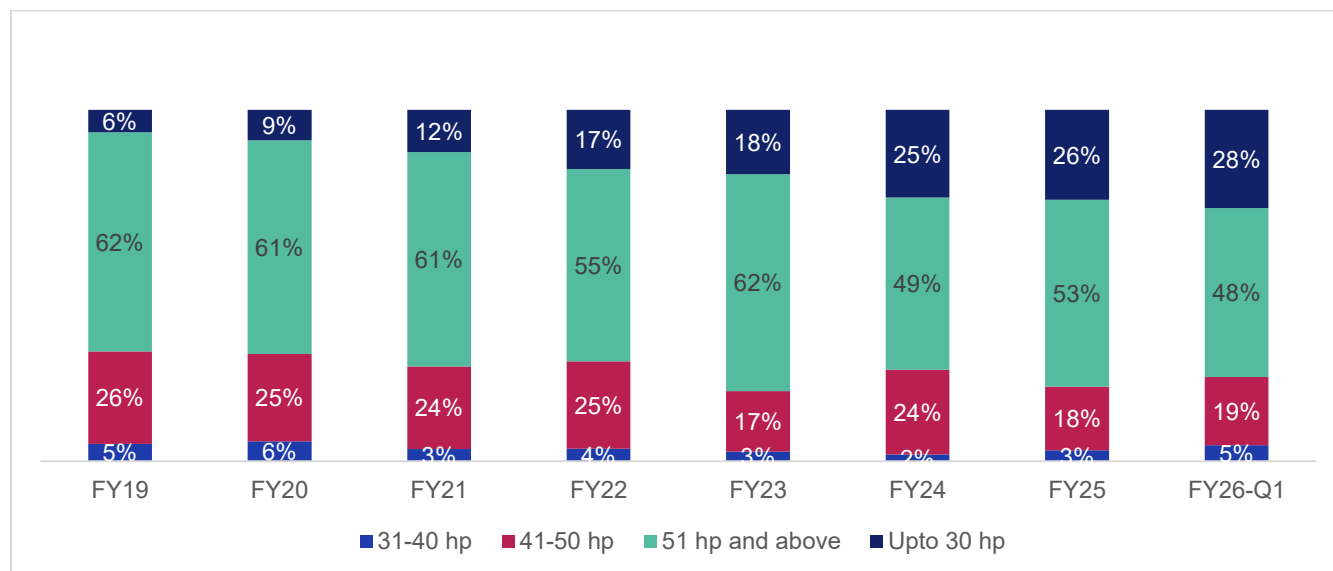
Tractor exports

Exports, accounting for about 10% of the overall tractor sales as of fiscal 2025, are expected to grow at a pace of 3-5% on-year in fiscal 2026 on account of revival in demand from the USA, Europe and other Asian countries. In fiscal 2025, exports rose by a slower ~1% on-year reaching ~99,000 units. Revival in demand from the US, Europe and Asia to support growth but not enough to get back to fiscal 2022 highs.

Strategic push, such as setting up a base in foreign countries, by players to cater to the global demand would aid export sales. With most of the global companies de-risking exports from China due to the complexities and disruptions in the nation, India has become the natural hedge against Chinese exports. Further, with most of the companies equipped to comply with TREM IV norms, exports have bloomed in the past few years.

The export data for Indian tractors over the years from FY20 to FY25 reflects a fluctuating trend in the international market. This data underscores the influence of various global and domestic factors on the tractor export industry. The CAGR for this five-year period, considering both the ups and downs, stands at approximately 1.3%. While this growth rate may appear moderate, it signifies the resilience of the Indian tractor export industry in the face of various economic and global challenges.

Tractor exports from India between Fiscal 2019 to 2025



Source: TMA, CRISIL intelligence

Outlook of Indian tractor industry

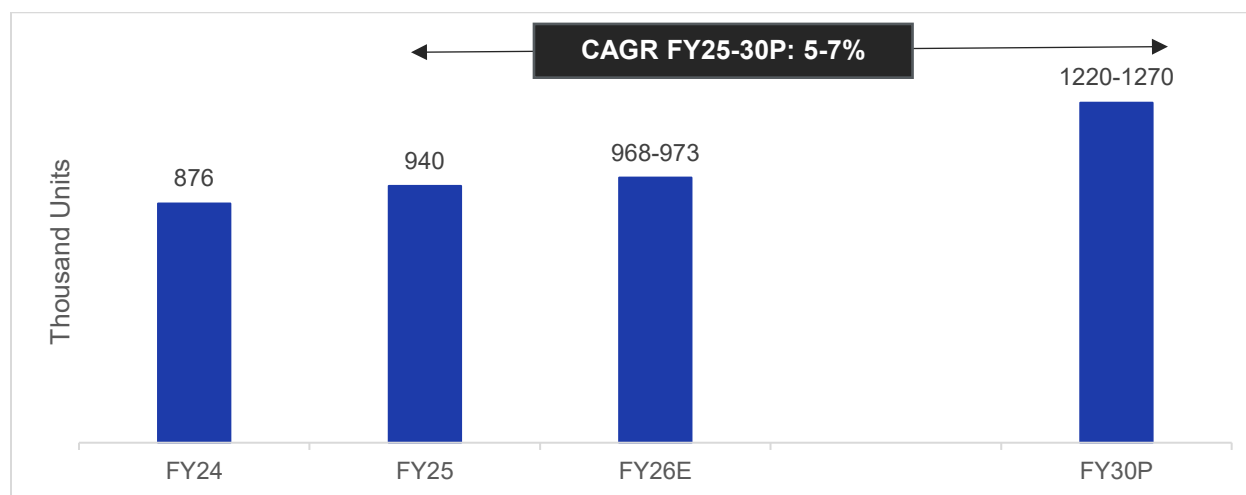
Domestic demand to grow 5-7% over next five years on a high base (fiscals 2025 – 2030P)

CRISIL Intelligence projects domestic tractor sales to expand at 5-7% compound annual growth rate (CAGR) during fiscals 2025 to 2030, after factoring in one to two years of erratic monsoon during the period along with healthy sales expected in the remaining years. From fiscal 2018 to 2023, the industry registered a CAGR of 5% due to healthy sales in fiscals 2017, 2018, 2021 and 2023.

However, anticipated decline in rabi profitability, low subsidy disbursement in the first quarter of fiscal 2025 amid general elections and slower growth in commercial demand to prevent further growth in fiscal 2025.

In fiscal 2025, with IMD's (Indian Meteorological Department) prediction of a normal monsoon season, domestic tractor sales grew by 6-8% on-year in volume terms. A normal monsoon season is expected to lead to healthy reservoir levels thereby positively impacting farmer sentiments and 8-10% on-year increase in volumes up for replacement to further support growth in the fiscal. Healthy rainfall led to higher festive demand in the second and third quarters. Healthy reservoir levels boosted rabi acreage and thereby crop profitability which, in turn, boosted tractors sales in the last quarter of the fiscal.

Tractor industry sales expected to increase 5-7% between fiscals 2025 and 2030P



Note – P: Projected

Source: CRISIL Intelligence

Growth up to fiscal 2030 will be on the back of low tractor penetration in the country (three tractors per 100-hectare area), government's focus on improving farm incomes through various schemes, promotion of farm mechanisation, and investments to improve rural infrastructure.

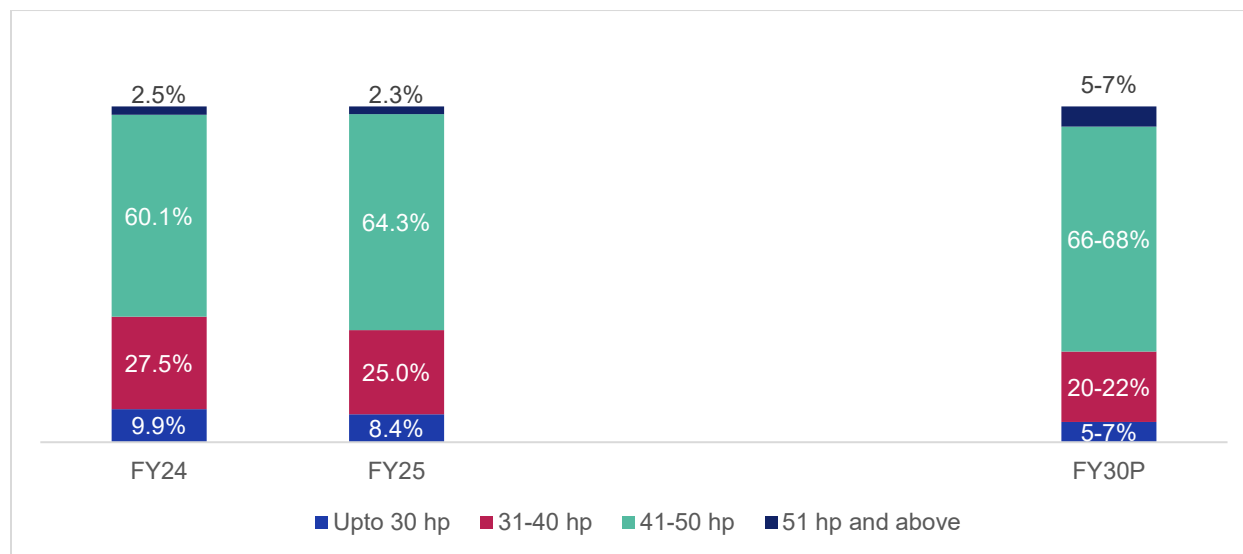
Tractors is a cyclical industry and has been observed that whenever the industry gets into a downturn, it takes 4-5 quarters for the industry to recover. Thus, assuming that the industry will be impacted by poor monsoon for one to two years between fiscal 2025 and 2030 with the industry taking 4-5 quarters to recover, our long-term assessment suggests that the tractor industry will grow at a CAGR of 5-7%. The growth will be supported by low tractor penetration in India (3 tractors per 100-hectare area); government's focus on improving farm incomes through various schemes, promoting farm mechanization; and investments to improve rural infrastructure. Strong pick up in replacement demand along with higher crop prices aiding revival in the second half of fiscal 2025. Domestic tractor sales grew at a pace of 6-8% on-year in fiscal 2025 on account of increase in cash in hands of farmers, healthy replacement demand and rise expected by 2-4% on-year in fiscal 2026.

Segment-wise growth outlook (fiscals 2025 – 2030P)

CRISIL expects upgradation from 31-40 hp tractors to 41-50 hp tractors over the next five years, as farmers are likely to upgrade to higher hp segments, realising the benefits of mechanization and higher productivity from increased usage of implements along with tractors. This has played out from fiscal year 2020 to 2025, with 41-50 hp now accounting for 64% in the total share gaining 15% share and 31-40 losing almost 8%. Additionally, the growing trend of collaborative farming, increasing commercial usage, and higher irrigation intensity will boost usage of higher hp tractors. We expect a more gradual movement towards 51 hp and above tractors, as they are less amenable to multipurpose applications (like the 41-50 hp) and the price gap is big (at least 10-15% between a 50 hp and a 55-60 hp tractor since emission norms change at 50 hp).

The market for 70-75 hp tractors is niche and is still evolving in India. These tractors are used mainly for farming along with implements, while 41-50 hp tractors can also be used for haulage and commercial activities such as sand mining. This increases their viability as these can be used for at least 700 hours a year.

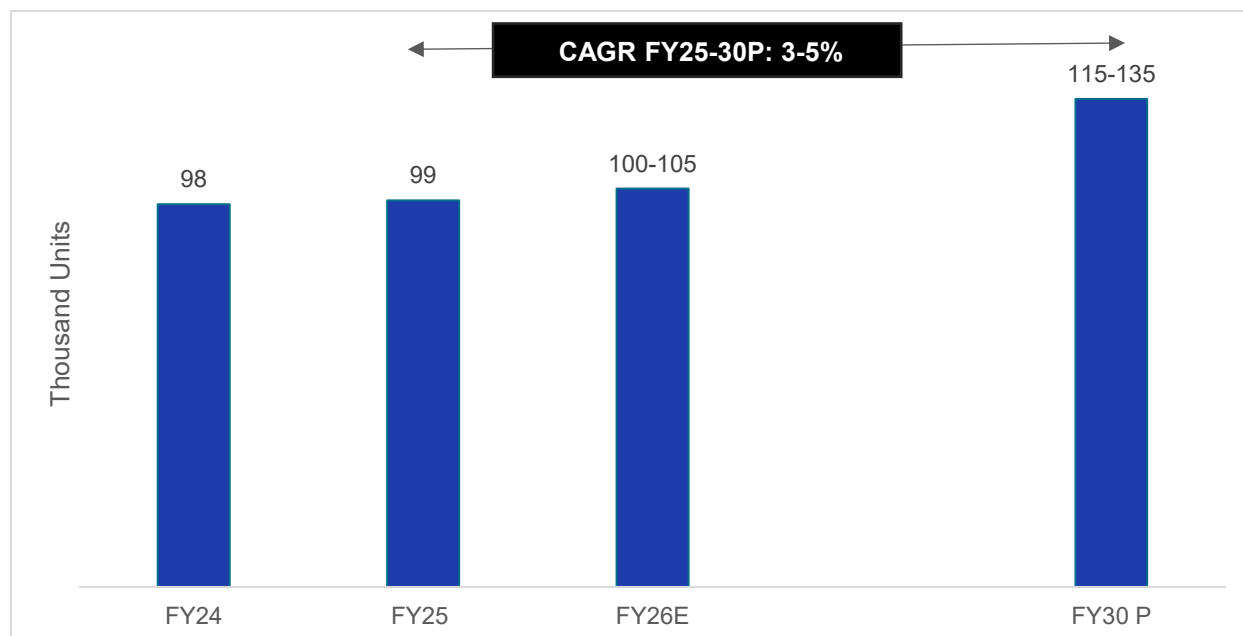
Higher hp tractors to see rise in proportion over long run



Note – P: Projected

Source: CRISIL Intelligence

Exports expected to grow at a CAGR of 3-5% from fiscals 2025 to 2030P



Note – E: Expected; P: Projected

Source: CRISIL Intelligence

Exports are expected to grow at a CAGR of 3-5% between fiscals 2025 and 2030. The USA, Europe & Asia are likely to remain the focal regions for long-term exports. Further, with India emerging as an export hub for relatively small tractors (30-75 horsepower/hp), and major companies increasing focus on international markets with the launch of 90-120 hp tractors, we expect sustainable export growth over the next five years. Rising demand for <30 hp tractors for gardening and hobby farming purposes is also expected to support growth.

Key growth drivers

Rabi crop profitability expected to improve in CY2025. In fiscal 2025, with an above normal monsoon season aiding farmer sentiments. Favourable rainfall boosted kharif crop output, with higher reservoir levels aiding to rabi crop profitability to further support tractor sales. Anticipated price rise of commodities like wheat, maize, paddy and mustard to drive the profitability growth on-year in CY2025. Government measures, including increased crop procurement and higher minimum support prices (MSP) for the rabi season, have uplifted farmers' cash flow thereby leading to healthy retail momentum.

Replacement demand expected to be higher

A large part of domestic sales is driven by replacement demand. Typical holding period for a tractor is around 6 to 9 years with most of the tractors being replaced in the country within 7-8 years. Of the overall domestic demand, 50-60% of the sales are replacement demand. For states having high penetration of tractors such as Punjab and Haryana, the replacement demand accounts for about 70-80% of the total sales. While states where farmer incomes are lower as compared to Punjab and Haryana have a lower replacement cycle (higher age tractors) compared to the industry average.

Replacement demand is expected to be higher by 15-17% on-year in fiscal 2026 on account of healthy sales registered in fiscals 2017, 2018 and 2019.

Non-farm usage of tractors on the rise

Commercial demand for tractor account for 16-23% of overall tractor demand on aggregate. Apart from their primary application in agriculture operations, tractors are also used to haul bricks, sand, and farm produce. In poor crop years and in months when there is no agricultural activity, renting out tractors for commercial purposes provides farmers an alternate source of income, thereby proving to be a good hedge. Some tractors are designed specifically for haulage operations and are used exclusively in commercial activities. Based on our industry interactions, tractors are also used as an alternative to pickups for haulage purposes. In fiscal 2026, we estimate commercial demand to rise to 17-19% of total tractor demand which can be attributed to an uptick in PMAY and PMGSY expenditures.

Rental model and low-cost tractors key to penetrating fragmented land holdings in India

Despite the huge potential total arable land offers, the fragmented land-holding pattern in India remains a hurdle. With over 80% of land holdings being small and marginal (less than 2 ha), most farmers are

unable to afford tractors. They depend on renting tractors or buying small tractors to improve productivity, a trend which is rapidly gaining hold.

Custom Hiring Centres (CHC) are a major component of the government's 'Sub-Mission on Agricultural Mechanisation (SMAM)' policy. These centres maintain farm equipment and machinery which can be rented out, especially to small and marginal farmers who cannot afford them.

Private sector participation via multiple unique business models is also improving farm mechanisation. CHCs face challenges such as lack of awareness among consumers about farm equipment usage, availability issue, high initial investment cost, maintenance of farm machinery, and providing equipment specific to local cropping patterns. Monitoring of CHCs remains a major challenge. However, involvement of key stakeholders and introduction of favourable schemes and policies can make the CHC concept successful in India.

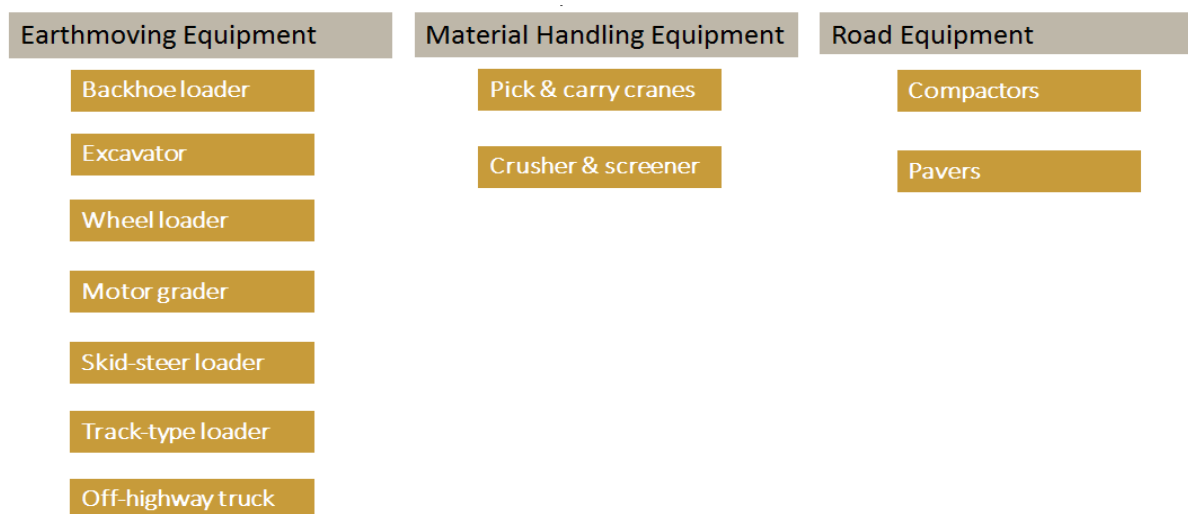
Review and Outlook of Indian Construction Equipment (CE) Industry (Earth moving and material handling)

Review of the domestic demand (fiscals 2023 – 2025)

CE are largely used for construction and infrastructure activity

CE are engineering machines and vehicles used for construction (industrial & infrastructure), agriculture, mining, waste management, and logging activities. They are also used to prepare the ground, excavation, haulage of material, and dumping/laying in a specified manner. The various types of machines used are backhoe loaders, excavators, wheeled loaders, skid steer loaders, graders, cranes, dozers and compactors.

Figure 1: Industry structure



Source: CRISIL Intelligence

Excavators, backhoe loaders, pick & carry cranes and compactors account for ~73% of the CE industry's revenue. In the construction sector, CE is mainly used in infrastructure and industrial construction.

Construction equipment has an average life of about 7-8 years, depending on frequency of the usage. However, various components need to be regularly serviced and replaced and hence, after-sales service forms a critical part of the manufacturers' offering. Hirers and small contractors are the major end-users of CE. Large engineering, procurement & construction (EPC) companies account for only about 10% of total demand. Backhoe loaders are most popular in the Indian market as they are multi-functional (i.e. excavation and loading), relatively low on maintenance and easy to mobilize. It accounted for ~50% (volume) and ~28% (value) of the CE market, followed by excavators ~35% (volume) and ~47% (value) which have a specialized usage pattern.

Product profile

Hirers and small contractors are the major end-users of CE. Large engineering, procurement & construction (EPC) companies account for only about 10% of total demand. Backhoe loaders are most popular in the Indian market as they are multi-functional (i.e. excavation and loading), relatively low on maintenance and easy to mobilize.

Sales of CE driven by EME sales, largely boosted by backhoe loader and excavator

Earth Moving Equipment Industry Volume: ~88,000			
Equipment	FY23	FY24	FY25
Backhoe Loader	37,000	47,000	48,000
Excavator	27,000	31,000	33,000
Wheeled Loader	3,500	3,800	4,200
Motor grader and Skid steer	2,700	2,900	2,800

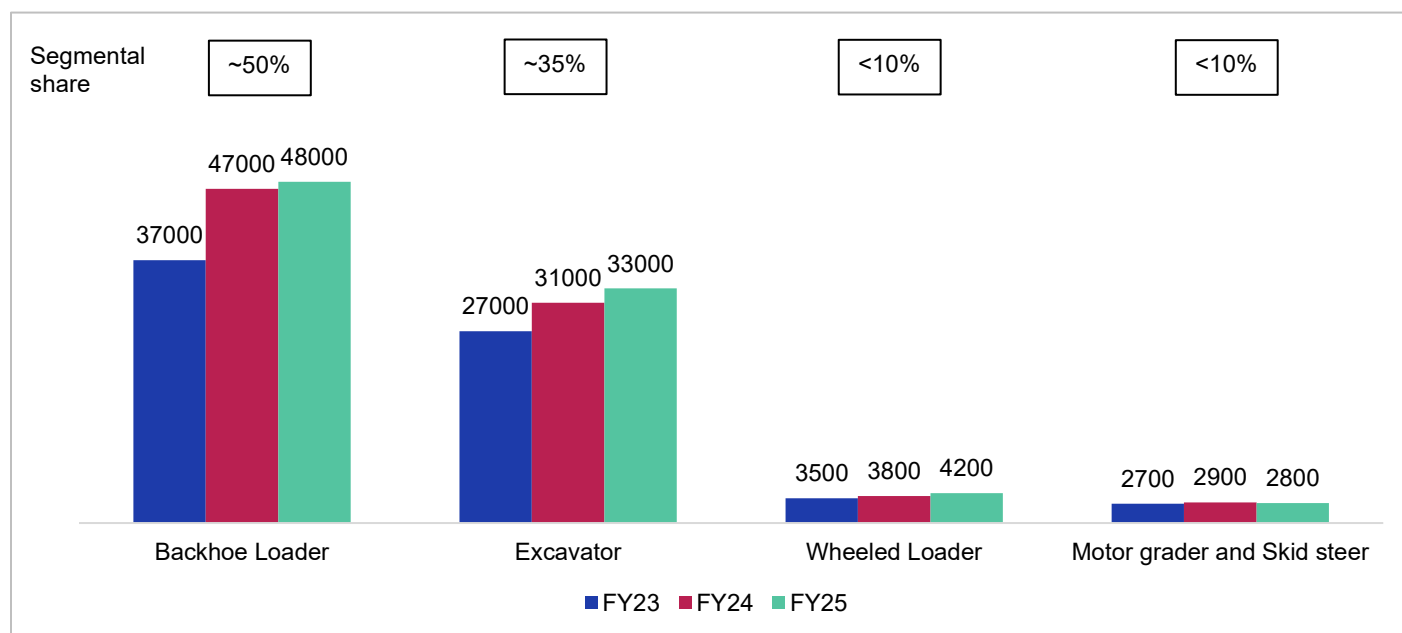
Material Handling and Road equipment industry volume: ~32,000			
Equipment	FY23	FY24	FY25
Pick & Carry Cranes	9,300	14,200	13,200
Compactors	3,500	4,600	4,900
Others*	2,000	2,500	2,670
Others**	8,000	11,000	11,230

Note:

1. Others*: include crushers & screeners and pavers
2. Others**: include Material processing, Mixers, Crawler

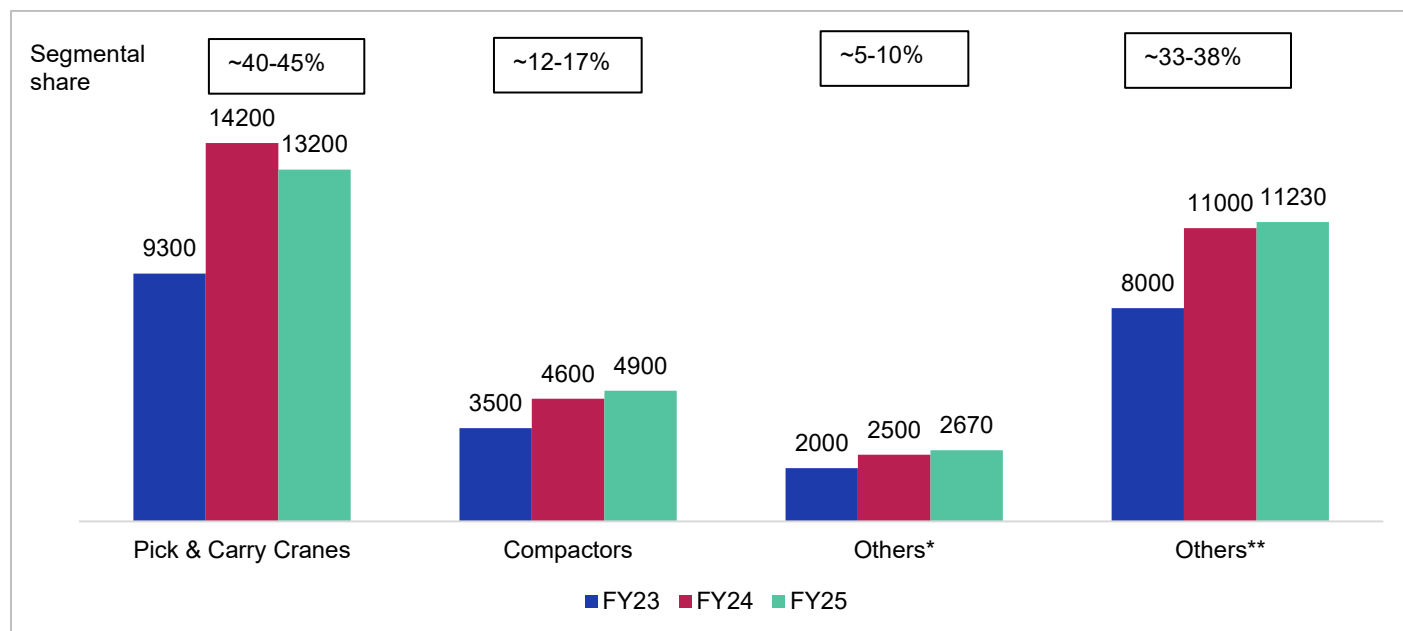
Source: CRISIL Intelligence

Earth moving equipment industry volume: ~88k



Source: CRISIL Intelligence

Material handling and road equipment industry volume: ~32k



Note:

1. Others*: include crushers & screeners and pavers
2. Others**: include Material processing, Mixers, Crawler

Source: CRISIL Intelligence

Emission norms and applicability to construction and mining equipment

The construction equipment vehicles (CEVs) are regulated by Bharat stage CEV emission norms, stage IV came into effect from April 2021 and latest CEV stage V implemented from 1st January 2025 aligning with European stage IV and V standard for diesel engines used in non-road mobile machinery. India will become the third region outside of the European Union and United states to adopt Stage V-equivalent emission standards. Non-wheeled equipment, mainly deployed in off-road / off-highway applications like mining and irrigation, continues to be outside the purview of these emission norms for now, in contrast with developed markets (like the EU), where such equipment is treated at par with the on-road CEVs and is regulated together under common norms.

CEV V emission standards will also accommodate a wider range of engines including those smaller than~37kw and larger than 560kw and stringent emission limits on particulate matter (PM), particulate number (PN) (BS V only), nitrogen oxide (NOX), hydrocarbon (HC), and carbon monoxide (CO). This is the first time India has adopted one set of consistent standards regulating both agricultural and construction equipment.

The stringent PM and PN limits are set at a level which will ensure diesel particulate filters, the key technology needed to effectively control particulate matter emissions from diesel engines, adopted as expected in the European Stage V standards. Engines equipped with selective catalytic reduction also must meet ammonia emission limits of 25 ppm for those less than 56 kW, and 10 ppm for those above 56 kW. Stringent emission regulations are critical to prevent a significant increase in air pollution from non-road diesel equipment. By implementing emission norms for construction equipment and mining, industries can reduce pollution and promote sustainable development.

Growth drivers

Indicators for construction equipment industry on a rise

Quarterly movement in the sales of the equipment can be easily tracked through a host of factors as in the chart below. Execution of projects was robust in fiscal 2023 especially for mining activities. To be sure these parameters were on a high base of fiscal 2022. The momentum has continued in fiscal 2024. However, normalisation in overall construction activity was observed in fiscal 2025, the quarterly indicators for the current fiscal reaffirm the same.

Figure 3: With all High Frequency Indicators showing positive signs, CE industry sales at all time high and sales volume expected to observe moderation in growth

	Q4 FY23	Q1 FY24	Q2 FY24	Q3 FY24	Q4 FY24	Q1 FY25	Q2 FY25	Q3 FY25	Q4 FY25
GFCF	Yellow	Yellow	Green	Green	Yellow	Yellow	Yellow	Yellow	White
Rural road execution	Red	Red	Red	Red	Red	Red	Red	Red	Red
National highway execution	Red	Green	Red	Green	Green	Red	Red	Red	Yellow
Cement production	Yellow	Green	Green	Green	Green	Yellow	Yellow	Yellow	Green
Bitumen demand	Red	Green	Yellow	Yellow	Green	Red	Red	Red	Red
Steel demand	Green	Green	Green	Green	Green	Green	Green	Green	Green
Power demand	Yellow	Green	Yellow	Green	Yellow	Green	Red	Yellow	Yellow

Legend: ■ <0% on-year growth, ■ 0-10% on-year growth, ■ >10% on-year growth

Source: CRISIL Intelligence

Healthy growth recorded in all segments in fiscal 2025

Construction equipment sector grew 26% in volume terms in fiscal 2024, following an 18% increase in fiscal 2023, driven by growth in the end user industries. The infrastructure sector growth is led by healthy rise on high bases in state and central government capex budgets, Government initiatives such as Gati Shakti and the focus on NIP to boost the infrastructure segments while Mining sector is expected to show growth in FY25 in order to meet the rising demand from the Power and metal sectors.

Healthy credit ratios across parameters

Construction equipment (CE) companies exhibit robust financial health, maintaining a favourable gearing ratio typically between 0 and 1, reflecting their balanced approach to debt. With generally low debt levels, these firms boast healthy

interest coverage ratios, benefiting from high financial flexibility, largely owing to their affiliation as subsidiaries of global industry giants.

Low EV Penetration outlook

Despite the broader push for electrification across the automotive and CV sectors, EV adoption in the construction equipment (CE) industry remains minimal with current penetration of electric construction machinery estimated to be less than 1%, largely limited to pilot deployments of compact equipment such as electric mini-excavators and loaders. Key barriers include the lack of high-capacity battery technology for heavy-duty use, limited charging infrastructure on construction sites, and high upfront costs. Given these structural challenges, the industry's transition to electric equipment is expected to remain slow in the near term.

However, OEMs are gradually ramping up R&D and collaborating with global partners to localize electric variants. EV penetration in CE is likely to see meaningful traction only post FY2027, once supporting ecosystem and policy incentives are in place.

Outlook on the construction equipment industry (fiscals 2025 – 2030)

CE industry to record double digit growth in fiscal 2024 on a high base; growth to moderate in fiscal 2025

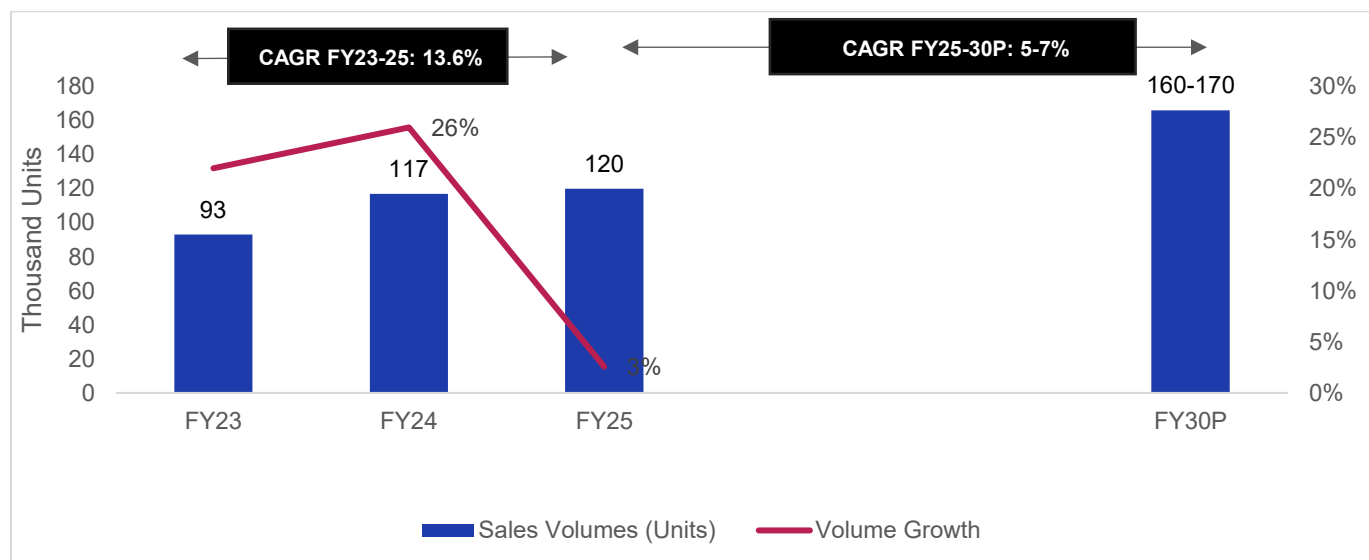
Construction equipment sector grew 26% in volume terms in fiscal 2024 driven by growth in the end user industries. Volume growth normalisation of 3-4% is seen in fiscal 2025 with the industry to breach high levels of 120K+ in volume sales with growing end user industry segments like roads, railways and urban infrastructure.

The infrastructure sector growth is led by healthy rise on high bases in state and central government capex budgets, government initiatives such as Gati Shakti and the focus on NIP to boost the infrastructure segments while mining sector is expected to show growth in fiscal 2025 in order to meet the rising demand from the power and metal sectors.

The volume sold are at an all-time high with rising infra and mining activity in the backdrop coupled with newer machinery complying to the BS-IV norms introduced in the market.

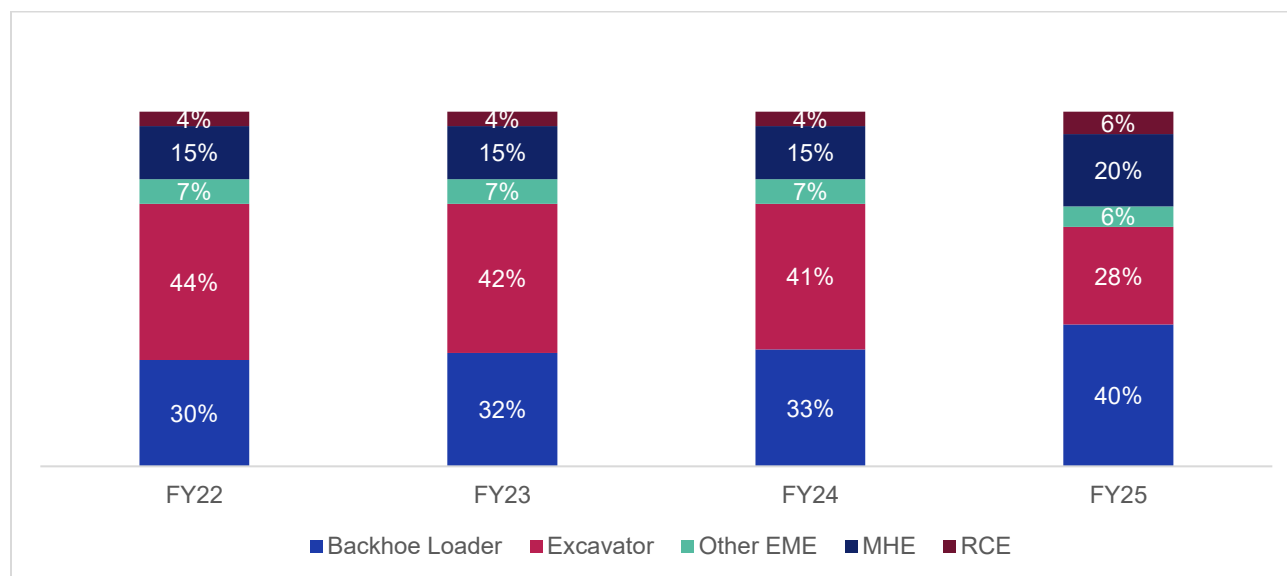
With humongous central government push and rising spur in construction activities, market size is expected to increase due to higher realisations and increase in prices passed on to consumers due to cost inflation of raw materials. However, since volumes have reached to peak in fiscal 2024, the momentum is moderate in fiscal 2025.

Review and outlook of Equipment volumes



Source: Industry, CRISIL Intelligence

Figure 5: Earthmoving equipment continues to form largest share in industry



Note: EME – Earth Moving Equipment, MHE – Material Handling Equipment, RCE – Road Construction Equipment

Source: Industry, CRISIL Intelligence

Long term potential intact driven by growth in end-user segments

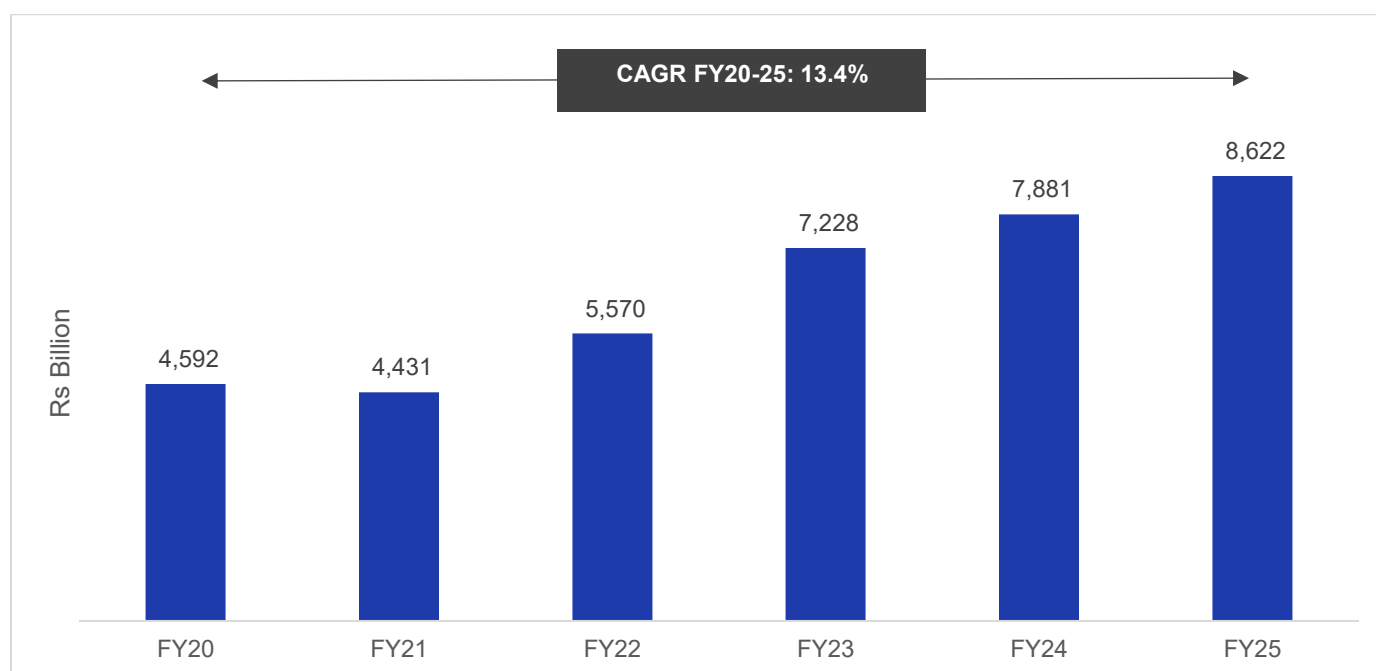
The construction industry in India is expected to grow steadily at an annual rate of 5-7% between fiscal years 2026 and 2030. This growth will be mainly driven by increased spending on infrastructure projects such as roads and railways, supported by both central and state government investments.

Review and outlook on the Indian Automotive Components industry

Auto component production (which includes sales to OEMs, exports and the replacement market) has increased at 13.4% CAGR to Rs 8,622 billion in fiscal 2025 from Rs 4,592 billion in fiscal 2020. The Indian automotive component sector has experienced robust growth, driven by a combination of factors including resilient domestic demand, increase in exports, and enhanced value addition. As the country navigates its transition towards advanced mobility solutions, the industry is undertaking requisite investments, adopting cutting-edge technologies, and augmenting localization efforts to effectively cater to both the domestic and international markets.

While domestic sales are more volatile due to various factors such as regulations, fuel prices, economic cycles, etc. that impact short-term demand, exports and the aftermarket help buffer overall growth in auto component production from similar fluctuations.

Figure: Domestic production of auto components (fiscal 2020 to fiscal 2025)

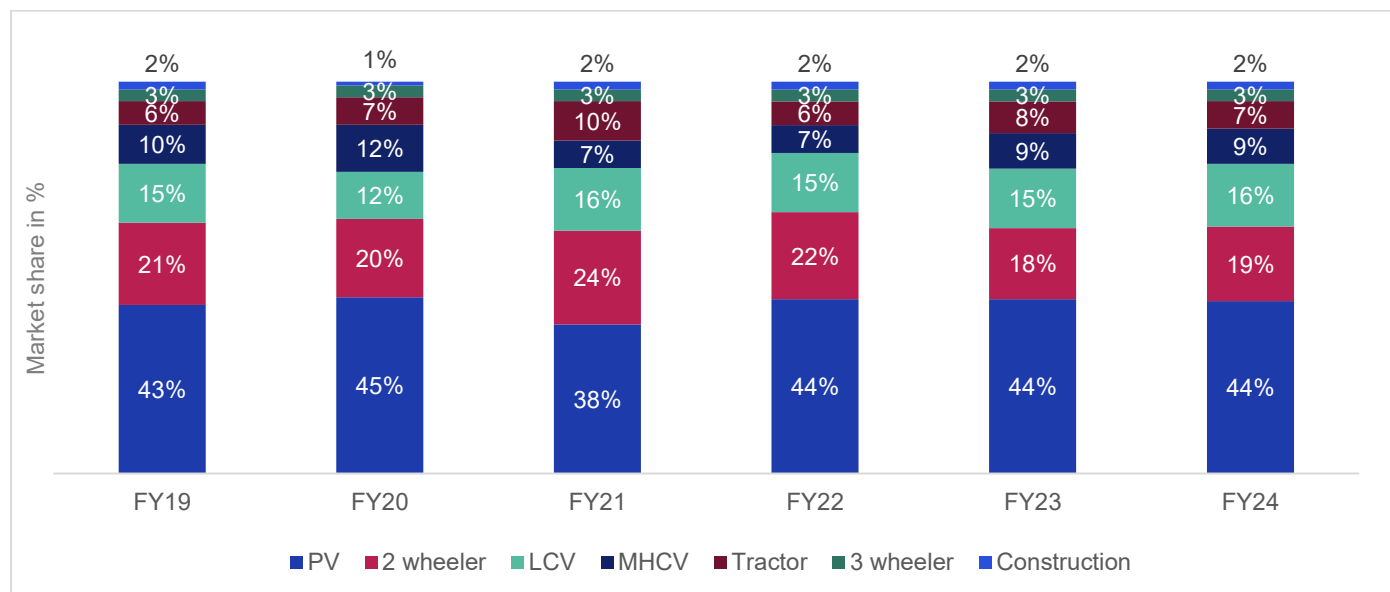


Note: 1 USD = INR 84.6, which is the average considered for fiscal 2025

Source: Automotive Component Manufacturers Association of India, CRISIL Intelligence

The domestic auto components industry largely comprises small and medium enterprises. The industry is composed of 780+ organized players and 5,800 unorganized players. In terms of revenue, however, the organized segment dominates. Auto Component Manufacturers Association (ACMA) members represent 85% of the overall industry turnover. Over the past few years, more auto component companies have been registering as members of the ACMA.

Figure: Review of auto component production segments by vehicle category, revenue share

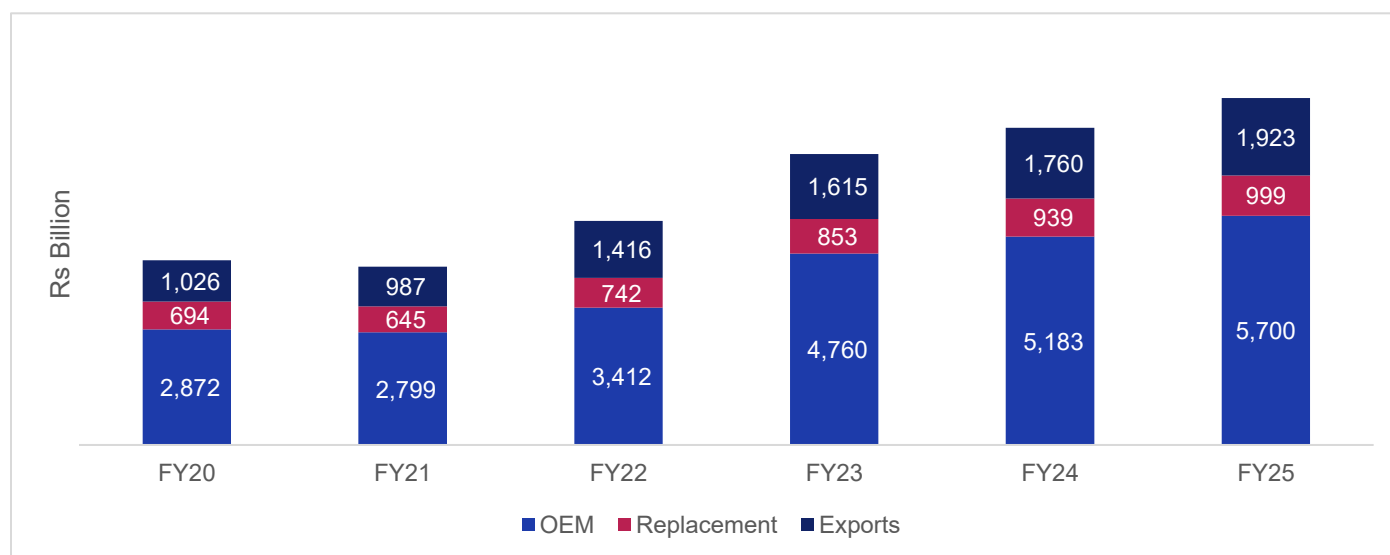


Source: Automotive Component Manufacturers Association of India, CRISIL Intelligence

Auto component production revenue increased at 13.4% CAGR between fiscals 2020 and 2025, helped by the economic recovery, buoyant demand from the OEM and replacement markets as well as increase in exports. CRISIL Intelligence estimates domestic auto component production revenue to increase 7-9% in fiscal 2026.

Production of automotive components depends on consumption by different end-user segments, such as OEMs, exports and the replacement market.

Figure: Trend in domestic production of automotive components (fiscal 2020 to fiscal 2025), INR billion



Source: Automotive Component Manufacturers Association of India, CRISIL Intelligence

Figure: CAGR trend in domestic production of automotive components (fiscal 2020 to fiscal 2025)

	OEM	Replacement	Exports
FY 2020-25	14.7%	7.6%	13.4%

Source: CRISIL Intelligence

Auto component production revenue has surpassed the fiscal 2020 levels, when the industry reported robust growth across segments. Passenger vehicles, commercial vehicles and tractors are seen surpassing pre-Covid levels of production in fiscal 2023 while 2W, 3W will recover from the slump in fiscals 2021 and 2022, albeit remaining below pre-Covid levels. Healthy demand from OEMs will drive auto-component demand followed by the replacement and export markets.

The second wave in April 2021 and the resultant lockdown impacted industry revenue in the first quarter of fiscal 2022. Post the reopening, there was some recovery in the industry in the second half. Growth in the fiscal was aided by economic recovery, buoyant demand from key export destinations such as North America and Europe and increased demand from the replacement market led by pent-up demand.

Review of exports of auto components (fiscal 2020 to 2025)

Auto component exports grew at a strong 13.4% CAGR during fiscals 2020-2025. Even during fiscals 2017-2020, exports increased to a healthy 11% CAGR. There was a contraction in fiscal 2021 amid the pandemic and related restrictions.

Growth drivers for Indian auto component industry

Demand side factors:

Vehicle production: PVs, CVs and tractors are seen surpassing pre-Covid levels of production in fiscal 2025 while 2W, 3W will recover from slump in fiscals 2021 and 2022, albeit still below pre-Covid levels. Healthy demand from OEMs has been driving auto-component demand followed by replacement and export markets.

CRISIL Intelligence expects almost all vehicle segments to log robust production growth over fiscals 2025-30P. Production of 2Ws, 3Ws, PVs and CVs are projected to grow at a CAGR of 8-10%, 8-10%, 6-8% and 3-5%, respectively, over the forecast period.

Rising Per capita income: According to the International Monetary Fund's estimates, India's per capita income (at current prices) is expected to increase at a 9.19% CAGR over CY 2025-30.

Investment in Infrastructure: Infrastructure improvements are expected to support automobile demand on account of employment generation, and improved accessibility and mobility.

Ride sharing: Rise of ridesharing and the gig economy can drive demand for auto components as vehicles in these services tend to have higher usage and mileage, which leads to more frequent wear and tear on parts like tires, brakes, and engine components. The constant operation also increases the need for regular maintenance and part replacements, benefiting the aftermarket segment of auto companies. Moreover, fleet operators seek to keep vehicles in optimal condition, which further drives demand for auto parts.

Electrification

To curb pollution levels, EVs are gaining global interest. In India as well, EVs are gaining popularity as the government is extending support via various policies to encourage EV adoption. Furthermore, growing awareness and concern for environmental issues is likely to drive electrification in India. The government support, coupled with rising awareness about EVs, environmental concerns, as well as the expansion in EV infrastructure is driving electrification in India. The EV segment received a real thrust in the last two years backed by model launches at competitive rates, price hikes in ICE vehicles, elevated fuel costs as well as an improvement in infrastructure support. Schemes such as Electric Mobility Promotion Scheme 2024 (EMPS 2024), FAME, PM E-DRIVE and PLI have offered a thrust to both demand and supply side of the EV market.

Supply side Factors:

- India has a cost advantage in auto component production since it has cheap labour costs, is the world's second-largest producer of steel, and is close to important automotive markets. This makes it an ideal location for businesses to source vehicle components.
- India exports a significant amount of car components, which is likely to increase in the future years. India excels at manufacturing particular types of vehicle components, such as shafts, bearings, and fasteners, giving it a competitive advantage over other countries.
- The industry has been continuously upping its quality standards and developing new products to compete globally. Trade liberalisation in western markets has led to the emergence of Asia as an export hub for Europe, and North and South America over the past decade. With supply-chain realignment, several countries (including India) are likely to emerge as global outsourcing hubs in the coming years.
- Many domestic manufacturers have successfully entered strategic alliances/collaborations, while others are actively testing the waters. Many of the world's leading Tier 1 suppliers have set up manufacturing facilities in India. in key automotive hubs such as Maharashtra, Tamil Nadu, National Capital Region (NCR) and Gujarat.
- Changes in the process of manufacturing and designing will support the pricing power of component manufacturers. Decline in auto component manufacturing in Europe largely due to rising energy costs, driven by geopolitical tensions and stringent environmental regulations, which have eroded profitability and led to reduced production capacity have also contributed to India's advantage. At the same time, the China +1 strategy has driven companies to diversify their manufacturing bases, with India emerging as a preferred alternative as a key export hub for automotive components, due to its lower costs, supportive government policies, and strategic location near growing markets.
- Moreover, the decline in CNG prices during the fiscal year 2024 supports the shift toward greater CNG usage, reinforcing the long-term potential for its adoption in vehicles. Volatile fuel prices, coupled with potential government incentives for eco-friendly alternatives, could further stimulate demand for CNG-powered vehicles.
- Powertrain industry benefits from a dual-channel demand structure, ensuring stability and growth across economic cycles. When new car sales increase, OEM demand for powertrain components rises as automakers ramp up production. Conversely, consumers retain their vehicles longer, driving demand for replacement powertrain products in the OES aftermarket. This acts as a demand driver when the OE demand/new vehicle sales experience a dip.

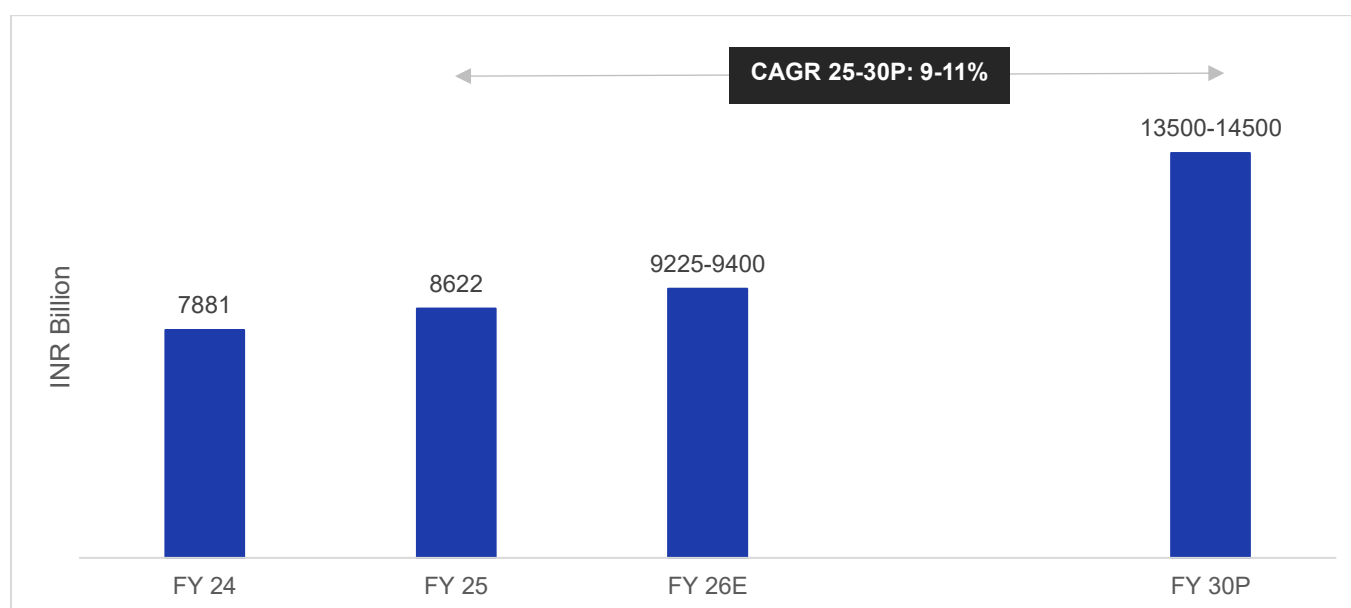
Outlook of Indian auto components industry (fiscal 2025 to 2030P)

CRISIL Intelligence expects auto component market size to grow at 9-11% CAGR between fiscals 2025 and 2030 to reach INR 13,500-14,500 billion. This is primarily driven by an increase in production off-take across all vehicle

segments, which will support growth in the OEM market. Long-term growth will appear higher over a low base wherein the auto component industry witnessed a significant decline in the preceding two fiscals (fiscals 2020 and 2021). Demand from all segments has grown further post fiscal 2023.

CRISIL Intelligence projects auto component revenue would increase 7-9% in fiscal 2026. The growth in fiscal 2026 will be aided by continued economic growth (GDP growth of ~6.5%), buoyant demand from the OEM and replacement market. Auto component exports (accounting for 22% of the overall demand in fiscal 2025) are projected to record a 6-8% on year growth in fiscal 2026. The growth would be on the back of demand from North America and Europe which together contribute ~60-65% to the export demand. Export revenues are also expected to be supported by increased global demand and China +1 strategy. However, rising inflation and global economic slowdown remains key monitorable.

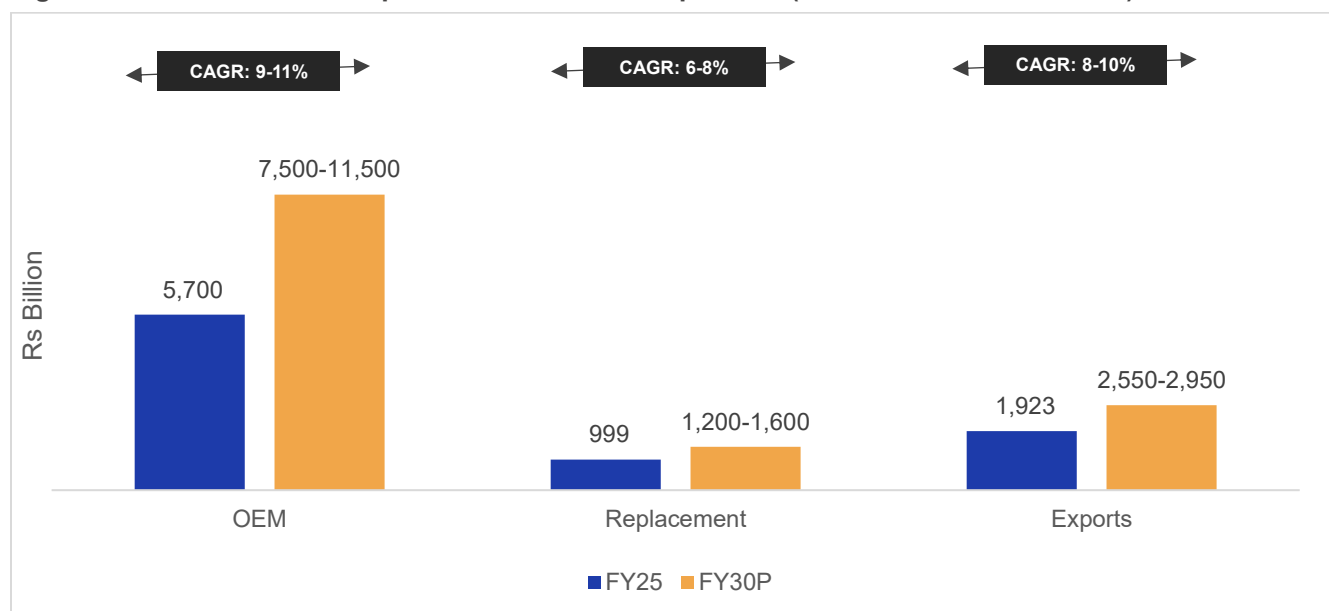
Figure: Outlook on domestic production of auto components, by value INR billion (fiscal 2025 to fiscal 2030P)



E: Estimated, P: Projected

Source: CRISIL Intelligence

Figure: Outlook on domestic production of auto components (fiscal 2025 to fiscal 2030P)



E: Estimated, P: Projected

Source: CRISIL Intelligence

OEM demand is expected to clock 9-11% CAGR between fiscals 2025 and 2030 on the back of robust production growth across asset classes in the medium term (on a low base) and aided by realization growth via OEM price increases.

The auto component replacement market is projected to increase by 6-8% CAGR between fiscals 2025 and 2030. This is due to healthy OEM sales barring the pandemic impacted fiscal 2020 and 2021 along with two to three years of replacement cycles. Moreover, auto component players undertook price hikes to offset the uptick in commodity prices. Hence, rising realization, to some extent, coupled with pent-up demand from fiscal 2021 wherein the vehicular movement was restricted is likely to aid the demand growth. Besides, demand in the replacement market is expected to grow due to an increase in penetration of cab aggregator services in the overall stock of passenger vehicles. Nonetheless, increased durability of components (better quality), better road infrastructure and increase in service intervals would restrict the robust growth.

Review and outlook of Tenneco Specific Components

Tier I suppliers are entities which supply products directly to the Original Equipment manufacturers (OEM) which are into the production of 2W, 3W, PV, CV and OH vehicles. Tier I companies that offer complete or assembled products such as transmission, engines, electronics, etc. OEMs prefer single suppliers for critical components to ensure consistent quality, streamline logistics, and enable close collaboration on design and performance. This approach reduces variability and enhances efficiency, though it requires strong trust and risk management due to dependency on one source.

The automotive industry is characterized by high customer stickiness due to the customized and technology-intensive nature of products, as well as the stringent and time-consuming product approval processes. This creates a barrier to entry for new suppliers, making it difficult for them to board new customers. As a result, existing suppliers with established relationships and approved products have a competitive advantage, leading to a stable and predictable revenue stream. The industry's dynamics favor long-term partnerships and relationships, where suppliers invest in research and development to meet the evolving needs of their customers, and customers prioritize reliability and quality over the price and new supplier onboarding.

Also, Tier 1 vendors play a crucial role in the supply chain, providing independent or integrated components to the automotive industry. They work with Tier 2 and Tier 3 vendors, adding value to products through manufacturing, design, or integration, and generating revenue by transforming raw materials into higher-value products. Tier 2 suppliers provide products and services to Tier 1 suppliers and often directly to OEMs. As direct suppliers to OEMs, Tier 1 vendors occupy the second level in the supply chain pyramid, promoting efficiency and specialization in the industry.

Overview of the Tenneco specific auto components

The company primarily deals with Clean air solutions, ignition systems, bearings, sealings, and shock absorbers & struts. Clean air solutions include exhaust systems and catalytic converters that form part of cold end and hot end of an aftertreatment system. The Ignition system includes spark plugs used in 2W, 3W, PV and SCV segments. Bearings include engine bearings used in automotive and off-highway applications. Sealings include cylinder head gaskets, turbo gaskets and exhaust system gaskets. Suspension includes shock absorber and struts used in the automotive applications.

End market channel	End market vehicle segment	Clean air	Ignition	Bearings	Sealings	Suspension
OEM Demand	2W/3W					
	PV					
	CT & OH					
	Industrial (genset)					
AM Demand	2W/3W					
	PV					

	SCV					
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Note:

- OH includes construction equipment, tractors and mining vehicles (dump trucks)
- Please note: The catalytic converter considered above do not include the ceramic substrate or any catalyst elements. Tenneco only performs canning and packaging of the ceramic substrate and hence, it is not part of the current market size, or the Tenneco revenues considered for market positioning.

Review and outlook of domestic Clean air solutions

Indian automobile industry is shifting towards low or no emission driven by government regulations and increasing need for ecofriendly vehicles. Aftertreatment systems in a vehicle are designed to reduce emissions and pollutants released into the atmosphere. These systems are typically used with ICE vehicles, particularly diesel engines, to minimize the environmental impact of vehicle emissions. The primary goal of aftertreatment systems is to reduce harmful emissions such as nitrogen oxides (NOx), particulate matter (PM), carbon monoxide (CO), and hydrocarbons (HC). Hence to reduce emissions, the automotive industry is focusing on developing advanced technologies such as exhaust gas recirculation (EGR) system and selective catalytic reduction (SCR) systems that are part of the modern aftertreatment systems. The use of aftertreatment systems in construction equipment, tractors and industrial applications (gensets) is also on the rise with tightening emission regulations.

Some common aftertreatment systems found in vehicles are Diesel Particulate Filter (DPF), Selective Catalytic Reduction (SCR) System, Diesel Oxidation Catalyst (DOC), Ammonia Slip Catalyst (ASC) and Exhaust Gas Recirculation (EGR) System.

Exhaust system: Exhaust system in a vehicle plays a crucial role in reducing emissions and improving fuel efficiency and enhance overall vehicle performance. The exhaust system is a critical component of a vehicle, responsible for directing exhaust gases away from the engine and reducing emissions. Major components of the exhaust system are exhaust manifold, downpipe, muffler, tailpipe and exhaust pipes. Exhaust manifold collects exhaust gases from the engine's cylinders and directs them into the exhaust system. Downpipe connects the exhaust manifold to the catalytic converter or turbocharger. Muffler is responsible for reducing the noise level of the exhaust gases. The muffler also helps to regulate the flow of exhaust gases, ensuring that they are directed away from the vehicle. Tailpipe which is part of the cold end directs the exhaust gases out of the vehicle. Exhaust pipes are responsible for connecting various components of the exhaust system.

Catalytic converter: The catalytic converter is a vital component of a vehicle's emission control system, responsible for reducing harmful pollutants and emissions from exhaust gases. A catalytic converter uses a catalyst to convert pollutants in the exhaust gases into harmless substances. It is typically located between the engine and the muffler, and its primary function is to reduce the emissions of CO, HC, and NOx. The catalytic converter uses a catalyst, typically made from precious metals such as platinum, palladium, and rhodium, to facilitate chemical reactions that convert pollutants into harmless substances.



Source: Tenneco

Emission norms and applicability to automotive industry

To enhance energy security and improve efficiency in use of energy for sustainability. The government has taken several measures, including diversification in sources of imports, promotion of alternate fuels, increasing production of oil and gas, substitution of energy refinery processes, and notification of fuel efficiency norms. The government has been promoting the use of biofuels such as ethanol and biodiesel to reduce environmental pollution.

Auto Fuel Vision and Policy-2025 initially proposed the implementation of BS-IV emission norms from 01.04.2017, BS-V emission norms for new vehicle from 01.04.2020 and BS-VI emission norms from 2024. However, Government decided to move directly from BS-IV to BS-VI emission norms in April 2020. India's decision to leapfrog from BS-IV to BS-VI in just three years, compared to a decade in Europe posed a major challenge. European solutions weren't directly applicable due to cost, infrastructure, and vehicle differences. Achieving a 50% reduction in particulate matter and 87% reduction in nitrogen oxides required significant innovation.

The Bharat Stage (BS) norms in India are emission standards instituted by the government to regulate the output of air pollutants from internal combustion engine equipment, including motor vehicles. These norms are designed to improve air quality by reducing vehicle emissions and are aligned with the European emission standards. The implementation of BSVI Stage II norms, effect from April 2023, will have significant impacts on vehicles in India. Here's a concise overview of these effects.

- Real Driving Emissions (RDE): Mandatory testing to ensure vehicles meet emission standards in real-world driving conditions.
- Enhanced On-Board Diagnostics (OBD 2): Advanced OBD systems to monitor real-time emissions and ensure ongoing compliance.
- Stricter Emission Limits: Tighter limits for pollutants like NOx, PM, HC, and CO

The implementation of BSVI emission norms has led to a significant reduction in vehicular pollution. This drives towards the development of improved engine technologies such as introduction of advanced emission control system, installation of catalytic convertor or diesel particulate filters (DPF) to reduce particulate matter and selective catalyst reduction (SCR) systems for reduction in Nitrogen Oxides (NOx) emissions in BS-VI compatible vehicles. The shift to BSVI norms has created a surge in demand for Clean air solutions including filters, catalytic converters and sensors.

Emission norms and applicability to construction and mining equipment

Construction equipment (excavators, loaders, compactors, and cranes) and mining equipment (dump truck) emit pollutants like particulate matter (PM), nitrogen oxides (NOx) and carbon monoxide (CO) contributing to air pollution. They also emit greenhouse gases (GHGs) like carbon dioxide (CO₂), methane (CH₄) and nitrogen oxide (N₂O) which contribute to climate change.

The construction equipment vehicles (CEVs) are regulated by Bharat stage CEV emission norms, stage IV came into effect from April 2021, and latest CEV stage V implemented from 1st January 2025 aligning with European stage IV and V standard for diesel engines used in non-road mobile machinery. India will become the third region outside of the European Union and United states to adopt Stage V-equivalent emission standards. Non-wheeled equipment, mainly deployed in off-road / off-highway applications like mining and irrigation, continues to be outside the purview of these emission norms for now, in contrast with developed markets (like the EU), where such equipment is treated at par with the on-road CEVs and is regulated together under common norms.

CEV V emission standards will also accommodate a wider range of engines including those smaller than~37kw and larger than 560kw and stringent emission limits on particulate matter (PM), particulate number (PN) (BS V only), nitrogen oxide (NOX), hydrocarbon (HC), and carbon monoxide (CO). This is the first time India has adopted one set of consistent standards regulating both agricultural and construction equipment.

The stringent PM and PN limits are set at a level which will ensure diesel particulate filters, the key technology needed to effectively control particulate matter emissions from diesel engines, adopted as expected in the European Stage V standards. Engines equipped with selective catalytic reduction also must meet ammonia emission limits of 25 ppm for those less than 56 kW, and 10 ppm for those above 56 kW. Stringent emission regulations are critical to prevent a significant increase in air pollution from non-road diesel equipment. By implementing emission norms for construction equipment and mining, industries can reduce pollution and promote sustainable development.

Emission norms and applicability to Genset Industry

The genset industry, also known as the generator, set industry, is a sector that manufactures and supplies generator sets, which are used to generate electricity in various applications, including residential, commercial, industrial, and recreational. The industry is driven by the growing demand for reliable and efficient power generation solutions or power backup solutions, particularly in areas where the grid is unreliable or non-existent. There are different types of gensets including diesel, gasoline, natural gas and biofuel. Diesel generators are primarily used to provide backup power in industries. However, these generators emit harmful substances such as NOx, Sulphur dioxide (SO₂) and PM contributing to air pollution

The Central Pollution Control Board (CPCB) has established guidelines for genset emissions, including limits for PM, NOx, CO and SO₂. India has adopted stage II and III emission norms for genset aligning with international standards. With the introduction of CPCB IV+ emission standard government aims to achieve 90% decrease in PM and NOx concentration in generator exhaust, surpassing the existing CPCB II standard. These emission standards are designed to simplify the regulatory landscape by establishing a single benchmark for portable and fixed generators, regardless of fuel type, with a power output of up to 800 KW to streamlined approach towards maintaining strict emissions reduction targets.

The CPCB IV+ guidelines will also drive towards significant technological evolution within the diesel generator industries. The manufacturers are required to invest in advanced engines and emission control technologies, including electronic fuel systems, advanced after-treatment systems (ATS), and exhaust gas recirculation (EGR) systems, to meet these standards. These advancements will lead to more efficient fuel combustion, improved pollutant control, and enhanced fuel efficiency.

The genset manufacturers must acquire type approval from CPCB, demonstrating compliance with emission norms. The manufacturers must also ensure conformity of production (CoP), verifying that genset meet emission standards during production. Noise pollution (Control and Regulation) complies with noise pollution regulation such as those specified by the CPCB.

Emission norms and applicability to Tractors Industry

Tractors follow non-road emission standards aligned with the BS emission norms. For a long time, both agricultural tractors and Construction Equipment Vehicles had the same emission standards under Bharat Stage (CEV/TREM). In September 2020, the agricultural machinery (TREM) and construction equipment vehicles (CEV) norms were separated.

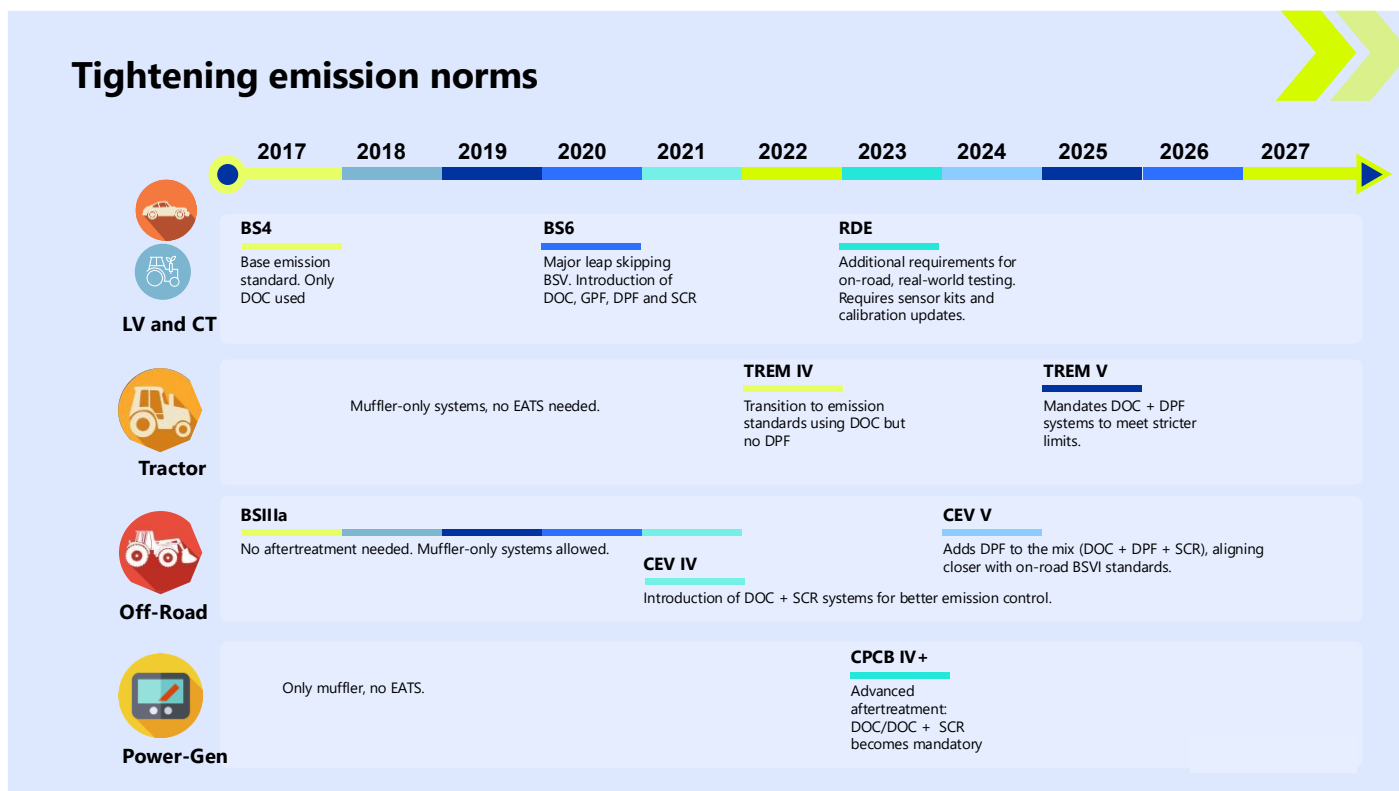
TREM IV emission norms are the latest standards introduced by the Indian government to control the release of harmful gasses from diesel engines. TREM IV norms came into effect from 1st January 2023. The norms would be applicable only for more than 50 HP tractors, which forms a smaller category of total tractors produced in the country. Those below 50 HP, which comprises most of the tractors, operate under the TREM-IIIA emission norm. TREM IV focuses on CO, HCs, NOx, PM, and PN pollutants. There is a requirement for advanced technologies such as EGR (exhaust gas recirculation), SCR (selective catalytic reduction) and DPF (diesel particulate filter) in this standard. TREM-V norms are expected to be rolled out in April 2026.

Stringent emission norms driving the adoption of advanced aftertreatment systems

Globally, countries are adopting stricter emission norms and zero-emission targets. Countries including India have adopted stricter emission norms in the past and are expected to continue implementing stricter emission norms across vehicle segments including PVs, CVs, tractors, construction and mining equipment. India and other countries are expected to continue implementing stricter emission standards across the PV, CV and OH end markets, such as Corporate Average Fuel Efficiency/Economy (CAFE) norms, Tractor Emission Regulation of India V (TREM V), Bharat Stage 7 (BS7), Construction Equipment Vehicle (CEV-V) and Central Pollution Control Board (CPCB IV+).

As emission norms are becoming more stringent after treatment system manufacturers design and produce newer products to meet the standard, leading to the use of advanced tech that complies with the emission and performance. These advance techs add cost and complexity to the after-treatment systems. Thus, the realization of the after-treatment system increases as the emission norms are becoming more stringent.

Tightening emission norms



Note: These new standards aim to further reduce levels of harmful emissions such as hydrocarbons, carbon dioxide, nitrogen oxides and particulate matter, from vehicles.

CAFE III standards are likely to be implemented from 2027-2032, propose carbon emission targets of 91.7 gm CO2 per km, and 70 gm CO2 per km for CAFE IV norms from 2032-2037 based on the World Harmonized Light Vehicles Testing Procedure (WLTP).

Review and Outlook on domestic Clean-air solutions industry, fiscal 2024-30P

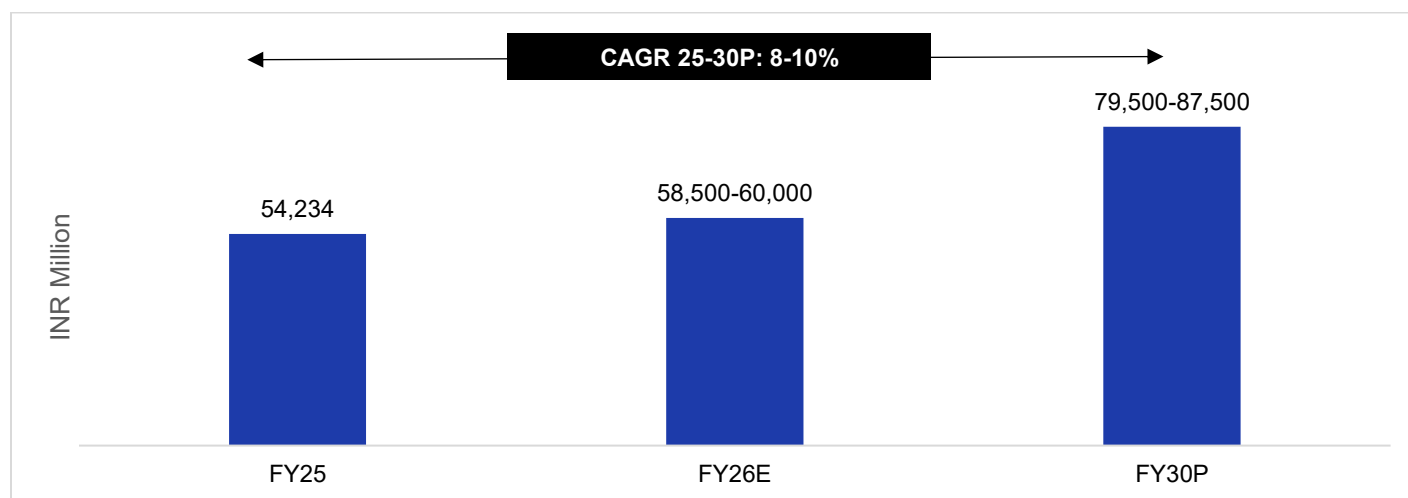
Clean air solutions primarily include exhaust systems and catalytic converters that are used in on-road, off-highway and industrial applications. Catalytic converters and exhaust systems are applicable for on-road vehicles such including PV, CV and SCV owing to the BS VI regulation mandating the treatment of exhaust gases. Tractor segment is regulated by TREM regulations, however, TREM IV is only applicable to tractors above 51 hp, whose share is ~10% in overall tractor industry. The rest of the 90% are unregulated and hence do not need catalytic converters. The OH category is regulated through CEV emission norms mandating the need for catalytic converters.

Segment	Component	Market	Channel
PV	Clean air solutions (Catalytic Converter and Exhaust Systems)	Domestic	OE
CV (Commercial vehicles)	Clean air solutions (Catalytic Converter and Exhaust Systems)	Domestic	OE
OH (Off-highway)	Clean air solutions (Catalytic Converter)	Domestic	OE

Industrial (Power-Gen)	Clean air solutions (Catalytic Converter)	Domestic	OE
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Note: For market sizing under OH, tractors, construction equipment and mining dump trucks that are above 560kW are considered

Clean air solutions market size (fiscals 2025-30P)



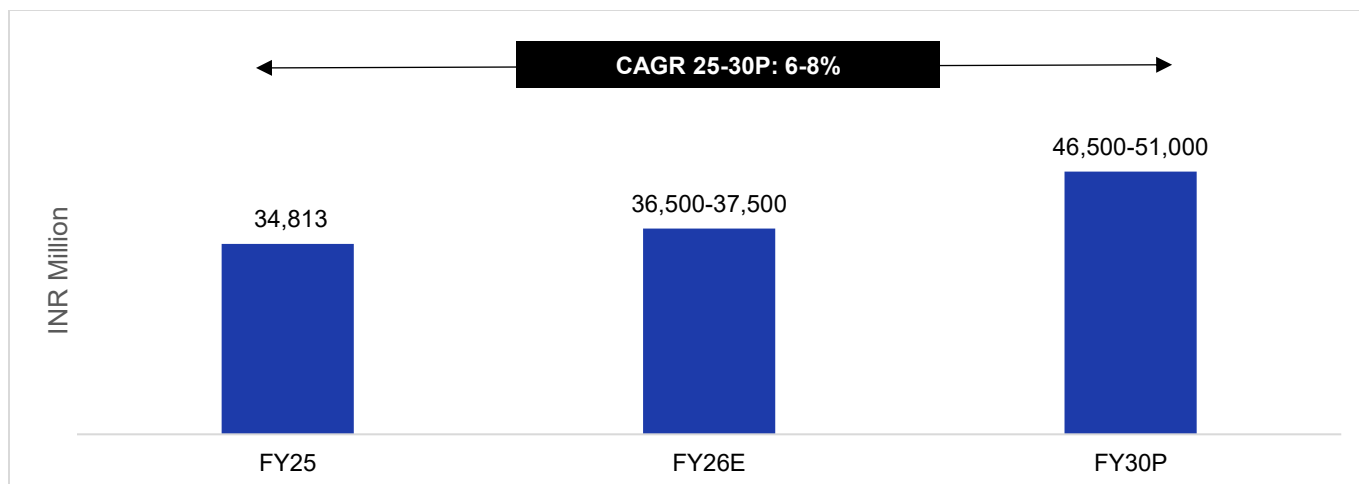
Note: E: Estimated, P: Projected

Source: CRISIL Intelligence

Please note: The catalytic converter considered above do not include the ceramic substrate or any catalyst elements. Tenneco only performs canning and packaging of the ceramic substrate and hence, it is not part of the current market size, or the Tenneco revenues considered for market positioning.

Clean air solutions market at an overall level is estimated at INR 54,234 million in fiscal 2025. It is expected to grow at a CAGR of 8-10% between fiscal 2025 and fiscal 2030 to reach INR 79,500-87,500 million. The market is primarily driven by strengthening emissions regulations mandating the need for more advanced aftertreatment systems.

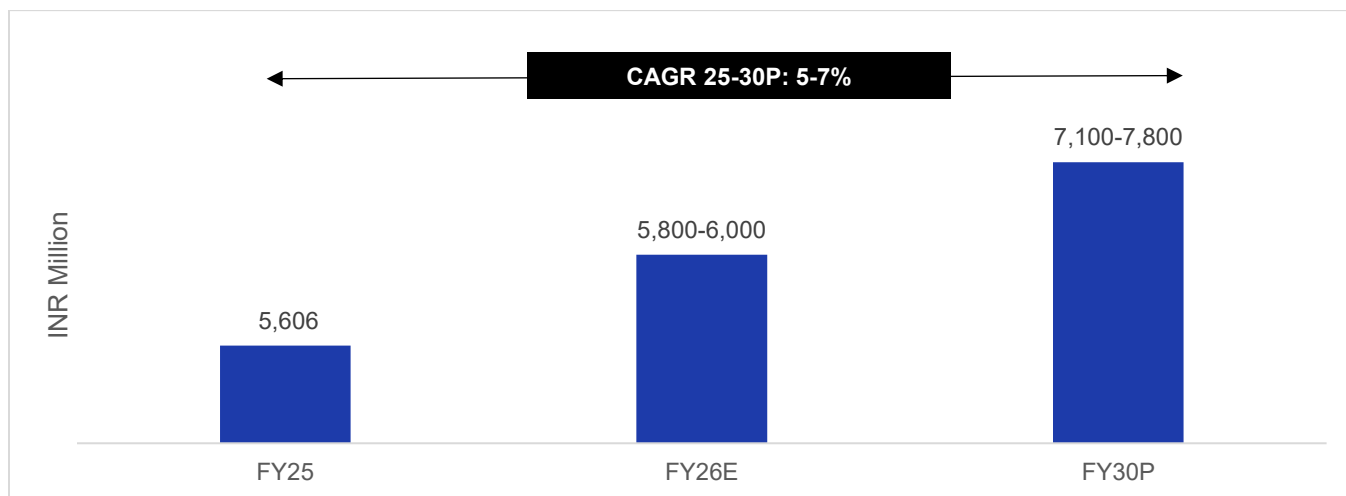
Clean air solutions market size for PV (fiscals 2025-30P)



Note: E: Estimated, P: Projected
Source: CRISIL Intelligence

Clean air solutions market for PV is estimated at INR 34,813 million in fiscal 2025. It is expected to grow at 6-8% CAGR over the fiscal 2025-30 to reach INR 46,500-51,000 million in fiscal 2030. Passenger vehicles are expected to grow by CAGR 4-6% to reach 5.3-5.7 million units in the fiscal year 2030. As the passenger vehicle grows, the traditional ICE will continue relying on Catalytic system and rise of alternate technologies such as hybrid and CNG drives the demand for Clean air solutions. Increasing environmental awareness and fuel cost benefits are driving CNG vehicles especially in PVs, CNG vehicles require specialized TWCs optimized for methane reduction, creating a niche but growing segment of the Clean air solutions.

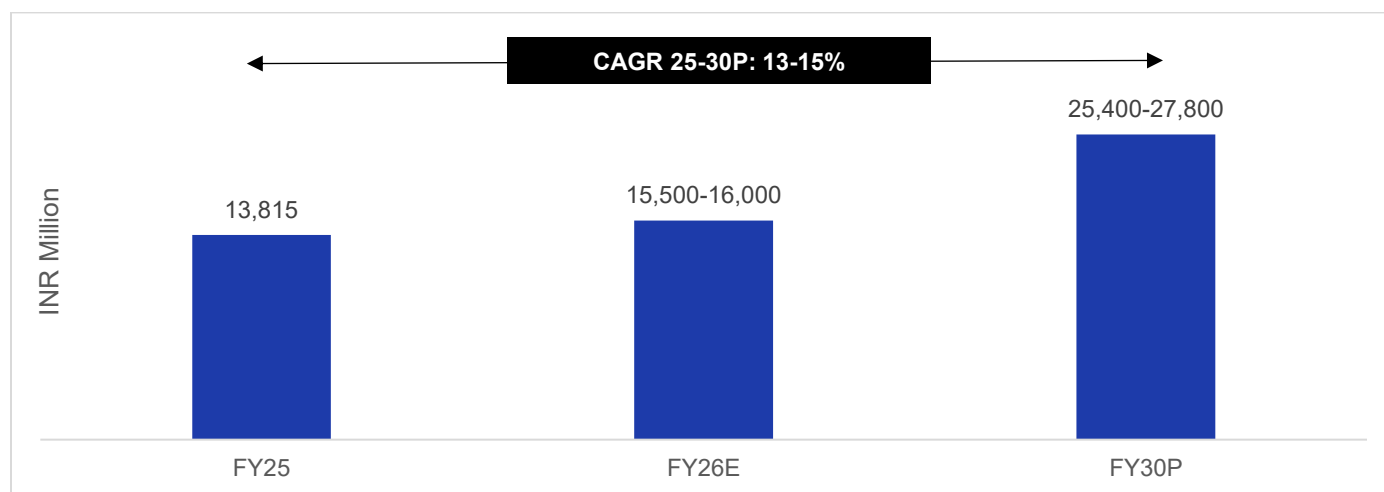
Clean air solutions market size for SCV and others (fiscals 2025-30P)



Note: E: Estimated, P: Projected
Source: CRISIL Intelligence
Please note: Others – Industrial section (Power gensets)

The SCV/I market is estimated at INR 5,606 million in fiscal 2025 while SCV market is estimated at INR 4,105 million for the same period. The industrial category which includes Power-gen (Gas and Diesel gensets) segment stood at INR 1,501 million with an expected CAGR of 6-8% to reach INR 2,000-2,200 million by the fiscal year 2030.

Clean air solutions market size for CTOH (fiscals 2025-30P)



Note: E: Estimated, P: Projected, CTOH includes CT (>3.5 to 55 tons), OH, Tractors and Mining
Source: CRISIL Intelligence

CTOH category, which includes CTs and Off-highway vehicles, stood at an estimate of INR 13,815 million in fiscal 2025 and it is expected to grow with CAGR of 13-15% between fiscal 25-30 to reach INR 25,400-27,800 million. The OH category (mining, tractors and construction equipment) is estimated to be INR 976 million and it is expected to grow by 10-12% CAGR to reach INR 1,500-1,800 million by fiscal 2030. Clean air solutions market for tractors will get a boost in the fiscal year 2027 with the introduction of TREM-V norms in the month of April 2026.

Heavy-duty trucks and buses will drive the substantial demand for SCR and DPF systems, as BS-VI norms mandate the PM reduction. Furthermore, the expansion of City Gas Distribution (CGD) network will increase demand for methane-optimized TWCs. Clean air solutions will grow modestly as CNG displaces diesel.

Earthmoving segments (Dozers, excavators and loaders) dominate the construction equipment market majorly due to infrastructure development of highways, and smart cities. The shift to CEV IV/V compliant engines increases demand for Clean air solutions to reduce particulate matter and NOx emissions. Also, growth in warehousing, spurred by e-commerce drives the cranes segment thereby increasing the demand for SCR and DPF systems for diesel variants. Mid-range tractors (30-50 Hp) contributes to the largest share in the Indian tractor industry, driven by versatile agricultural use. OEMs are integrating TREM regulated engines, requiring SCR and EGR systems to meet norms, especially as exports rise. In the high HP category (51 and above Hp), the segment seems to grow driven by the rise in commercial farming and construction applications, these tractors use diesel engines needing robust after treatment components to curb emissions.

Growth drivers and trends impacting the growth of the specific components in automotive industry

- With the Implementation of BS VI norms vehicles require to meet strict emission standards including minimizing limits for pollutants such as particulate matter (PM) and nitrogen oxide (NOx) which were mandated on 1st April 2020. This has led to an increased demand for catalytic converters and exhaust system that can reduce the emissions.

- The growing middle class and urbanization drives demand for personal transportation, especially passenger vehicles, that leads to a rise in demand for catalytic converters and exhaust systems in PV segment.
- Engine downsizing and Increasing adoption of turbocharging technology in passenger vehicles require advanced exhaust systems and catalytic converters.
- The growing adoption of alternate fuel vehicles such as hybrid and CNG drives demand for exhaust systems and catalytic converters in alternate fuel space.
- The growing awareness of environmental issues and the need for sustainable transportation solutions have driven the demand for low emission solutions.
- Shift towards SUV which is a diesel variant dominated vehicle segment requires diesel particulate filters (DPFs), selective catalytic reduction (SCRs) and diesel oxidation catalysts (DOCs) which is a mandate under BS-VI emission norm.
- Rise in consumer awareness for cleaner fuel solutions pushes the manufacturers to integrate advanced after-treatment solutions.
- Increased movement of goods is driving the demand for fuel-efficient and low-emission trucks.
- Increased investment in highways, metro projects, and smart cities is driving demand for low-emission construction equipment.
- Increase in construction activities for metro projects, commercial business parks and manufacturing facilities would be a prominent growth driver for power-generation industry (Gensets) which in turn will be growth factors for Clean air solutions

Emerging trends in Clean air solutions

- The implementation of stringent emission regulation norms driving manufacturers to adopt innovative thermal management technologies to improve fuel efficiency and reduce emissions.
- The emerging trend in exhaust management systems focuses on developing cleaner, more efficient, lighter systems to meet strict emissions regulations with advancement in catalysts, filtration technologies and smart technologies.
- The exhaust mufflers are switching towards efficient, lightweight and durable designs. The growing trend towards the adoption of advanced material such as stainless steel and aluminum in muffler production.
- The stringent emissions norms are also inclined towards the active noise reduction and cleaner exhaust system.

Company overview of key players

Sharda Motors: It is one of the leading Indian manufacturers specializing in exhaust systems, catering to both passenger vehicles, commercial vehicles and off-highway vehicles. Product portfolio includes hot-end components, cold-end components, and mufflers designed to meet stringent emission norms like BS-VI. With a strong focus on innovation, precision engineering, and sustainability. Sharda motors collaborate with major automotive OEMs to

enhance vehicle performance. In 2019, company entered a JV with Purem Germany (Eberspaecher Exhaust Technology International) for manufacturing of exhaust aftertreatment systems for Indian commercial vehicles.

SM Auto: It is one of the prominent manufacturers of exhaust systems and after-treatment solutions for the automotive industry. It has technical collaborated with Eberspaecher GmbH & Co.KG for passenger cars exhaust system and develops high-performance exhaust systems that meet stringent BS-VI emission norms for passenger vehicles. The company also has technical collaboration for Trem - IV and Trem V for off-road vehicles with Proventia OY, Finland.

Cummins Emission Solutions (CES): CES is a global player in after-treatment technologies, providing advanced emission control solutions for on-highway and off-highway applications. The company holds expertise in oxidation catalysts, particulate filters and SCR technology in compliance with BS-VI emission norms.

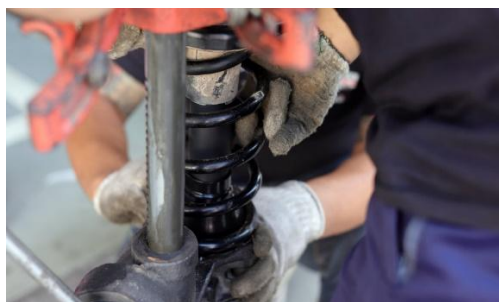
Faurecia Clean Mobility (Forvia): Faurecia Clean Mobility is a joint venture between Faurecia Emission Control Technologies, France, and ANAND, India. The company manufactures range of aftertreatment products and systems for passenger vehicles and commercial vehicles in India including Ammonia Storage and Delivery system (ASDS), catalytic converters, SCR and diesel/gasoline particulate filters.

Tenneco: Tenneco is a global player in clean air technologies. Tenneco delivers industry-quality after-treatment systems that helps vehicles meet stringent emission norms across the globe. In India, Tenneco has its presence in PV, SCV, CV and OH (Off-highway vehicles). Tenneco's leadership is evident in the CV category, where it is a dominant supplier of emission control solutions. The company holds a commanding position in the PV segment. In the OH category, Tenneco maintains a strong, reliable presence, supporting heavy-duty equipment in achieving regulatory compliance. Tenneco India is the largest supplier of clean air solutions to Indian CT industry with a market share of 57% in terms of value (revenue) and has a market share of more than 65% in off-highway OEMs (excluding tractors) in terms of value (revenue) in fiscal 2025. For Indian PV OEMs, they are among the top 4 suppliers of clean air solutions in the market.

Review and outlook of domestic Suspension Components

Shock Absorbers

Shock absorber is a crucial suspension component designed to control and dampen the impact and vibrations caused by road irregularities. It ensures that a vehicle maintains stability, traction, and comfort by absorbing energy from the suspension system. Without shock absorbers, vehicles would experience excessive bouncing and instability, making driving uncomfortable and unsafe.



Source: Tenneco

Struts

Strut Assembly is a structural suspension component that combines a shock absorber and coil spring into a single unit. It provides both damp and structural support, reducing the number of separate suspension components needed. Struts support the vehicle's weight, whereas shock absorbers only dampen motion.

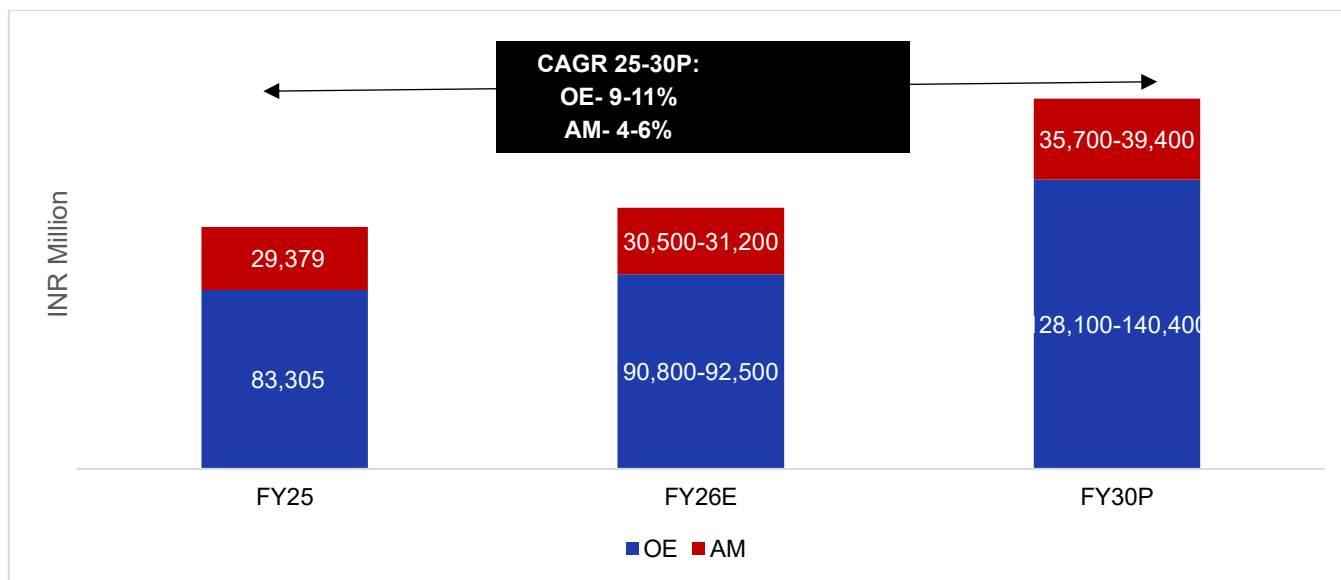


Source: Tenneco

Suspension products market size (fiscals 2025-30P)

The overall suspension products market is expected to grow between 8-10% CAGR over the next five years though fiscal 2025 reaching INR 165,500-181,500 million. In the domestic OE market, 2W accounts for a significant portion, with an estimated INR 53,557 million market in FY25, while passenger vehicle market is estimated at INR 27,407 million followed by 3W and SCV (small commercial vehicle) estimated at INR 1,236 million and INR 1,105 million respectively.

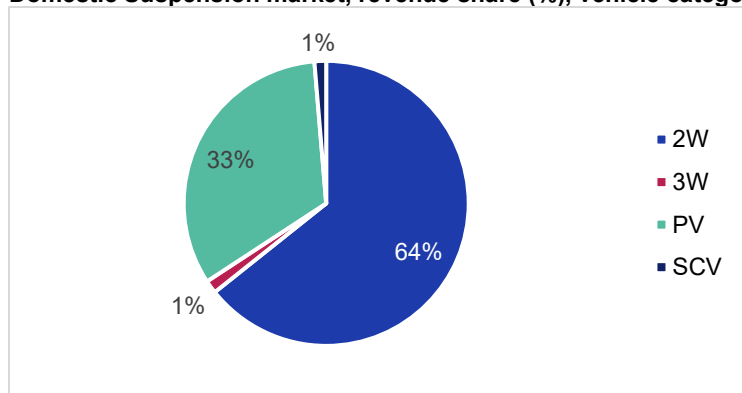
Domestic OE and AM suspension market (fiscals 2025-30P)



Source: Crisil Intelligence

Note: OE includes 2W, 3W, PV, and SCV; E: Estimated, P: Projected

Domestic Suspension market, revenue share (%), vehicle category, FY25 (Only OE demand)



Source: Crisil Intelligence

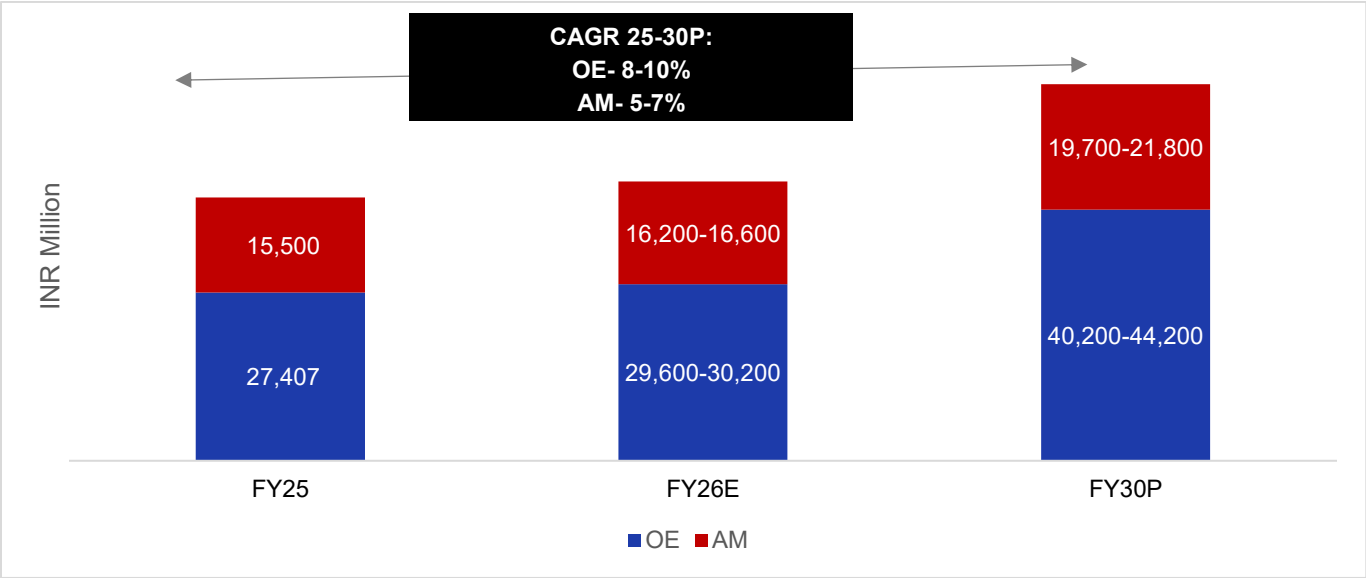
The 2W segment leads the market with 64% share due to increasing demand for improved ride quality, better suspension systems, and rising adoption of premium motorcycles and scooters. With the growing focus on road safety and rider comfort, manufacturers are continuously innovating to offer advanced suspension technologies. PV segment, with a ~33% share, is driven by the rising sales of SUVs equipped with high-performance shock absorbers. As automakers focus on comfort, stability, and fuel efficiency, demand for advanced shock and strut systems is expected to grow in the coming years.

While 3W and SCVs contribute a smaller share at ~1% and 1% resp., their market presence remains essential. The push for last-mile connectivity and urban logistics solutions is expected to fuel demand for durable and cost-effective suspension components in these segments.

Domestic PV AM suspension market

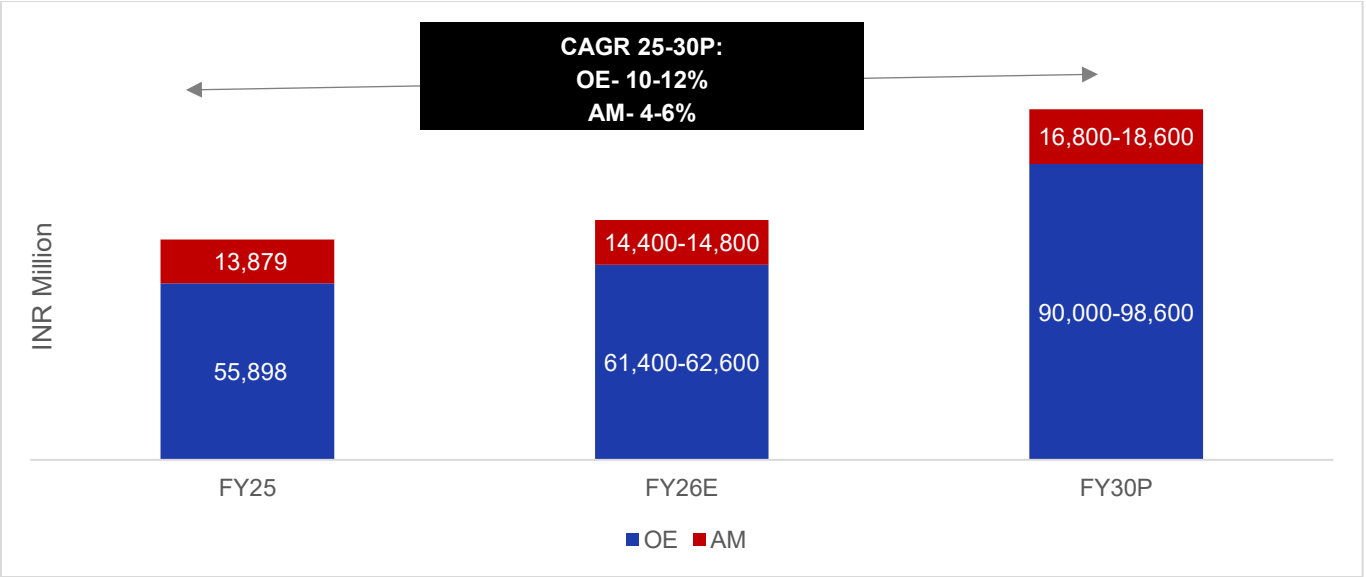
The domestic market size of AM is estimated at INR 15,500 million in FY25 and it is expected to reach INR 19,000-21,000 million in FY30 with a CAGR of 5-7% between FY25 to FY30. The aftermarket segment is heavily influenced by vehicle parc, road infrastructure, driving behavior, and maintenance practices.

Domestic PV OE and AM suspension market (fiscals 2025-30P)



Source: Crisil Intelligence

Domestic 2W, 3W and SCV OE and AM suspension market (fiscals 2025-30P)



Source: Crisil Intelligence

Note: E: Estimated, P: Projected

For OE: 2W, 3W and SCV is included

For AM: 2W, 3W, and SCV included

Key trends and growth drivers for Shock absorbers & struts

Technological advancements in suspension systems are transforming the automotive industry, particularly in India, where vehicle performance, ride comfort, and durability are key concerns due to diverse road conditions.

Adaptive and semi-active suspension systems

Modern premium and high-end vehicles feature semi-active and adaptive suspension systems with sensors and electronically controlled dampers that adjust in real time, improving ride comfort, stability, and handling. Example: Vehicles with magnetorheological dampers adjust shock absorber stiffness based on road conditions, reducing vibrations and improving stability. As technology becomes more accessible, semi-active suspensions are making their way into more mainstream models. Also, with the rise of EVs, OEMs are moving towards advanced and low noise suspension systems to achieve superior comfort and counteract the effects of battery weight. For example, BE 6e and XEV 9e, the new EV models from Mahindra use intelligent semi-active dampers. Also, Mahindra Roxx uses the first in-segment hydraulic rebound system (HRS), a suspension system that offers improved ride quality than conventional products.

The demand for advanced suspension systems is driven by the need for enhanced driving experience and performance. Premiumization in PVs, fueled by SUV demand, and electrification are expected to further boost demand for advanced suspension systems in the automotive market.

Lightweight and high-strength materials: Suspension components are now being made with aluminum alloys, carbon composites, and high-strength steel to reduce vehicle weight while maintaining durability. Lighter shocks and struts contribute to better fuel efficiency, a crucial factor in India's cost-conscious market.

Advanced Manufacturing Techniques: Technologies like 3D printing, laser welding, and precision forging enhance the quality and reliability of shocks and struts, ensuring longer lifespan and improved performance. Manufacturers are adopting automated production lines and AI-driven quality control systems to improve efficiency.

Integration of Smart Sensors and IoT: Use of smart sensors in suspension systems allowing real-time monitoring of road conditions, vehicle load, and driving dynamics with these systems providing predictive maintenance alerts, reducing downtime and improving vehicle longevity.

EVs and Hybrids: Transforming the Shocks and Struts market

Shift to electric and hybrid vehicles is reshaping suspension design due to their heavier battery packs, which demand stronger and more durable shocks and struts. Additionally, the absence of engine noise makes suspension vibrations and road noise more noticeable, driving the need for quieter, more refined damping systems.

Regenerative braking in EVs alters weight distribution and ride dynamics, requiring adaptive suspension solutions. Many EVs now integrate air suspension and smart dampers, which enhance comfort, efficiency, and compatibility with autonomous driving systems. As India's EV adoption grows, demand for advanced, electronically controlled suspension systems will continue to rise.

Company overview of key players

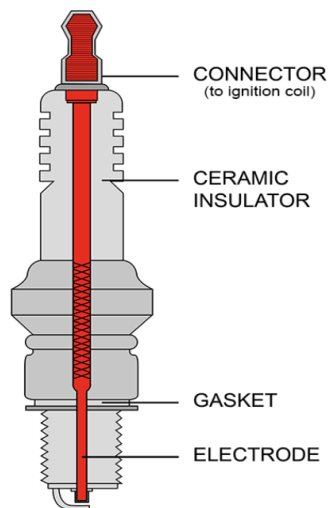
Gabriel: Gabriel India Limited, is a leading Indian manufacturer of suspension products, including shock absorbers, struts, and front forks. It caters to various automotive segments, including passenger cars, utility vehicles, commercial vehicles, and two-wheelers on both OE and AM segments.

Endurance: Endurance Technologies Limited specializes in manufacturing and supplying suspension systems for two-wheelers, and three-wheelers. They manufacture both adjustable and non-adjustable front forks and mono shock absorbers for both OE and AM segment.

Tenneco: Tenneco is a dominant player in suspension technologies, offering cutting-edge suspension systems that enhance comfort, handling, and vehicle stability. In India, the brand has established itself as a dominant player in the PV segment. Tenneco India is the largest supplier of shock absorbers and struts to Indian PV OEMs with a market share of 52% (in terms of value) (revenue) in fiscal 2025.

Review and outlook of domestic Ignition components

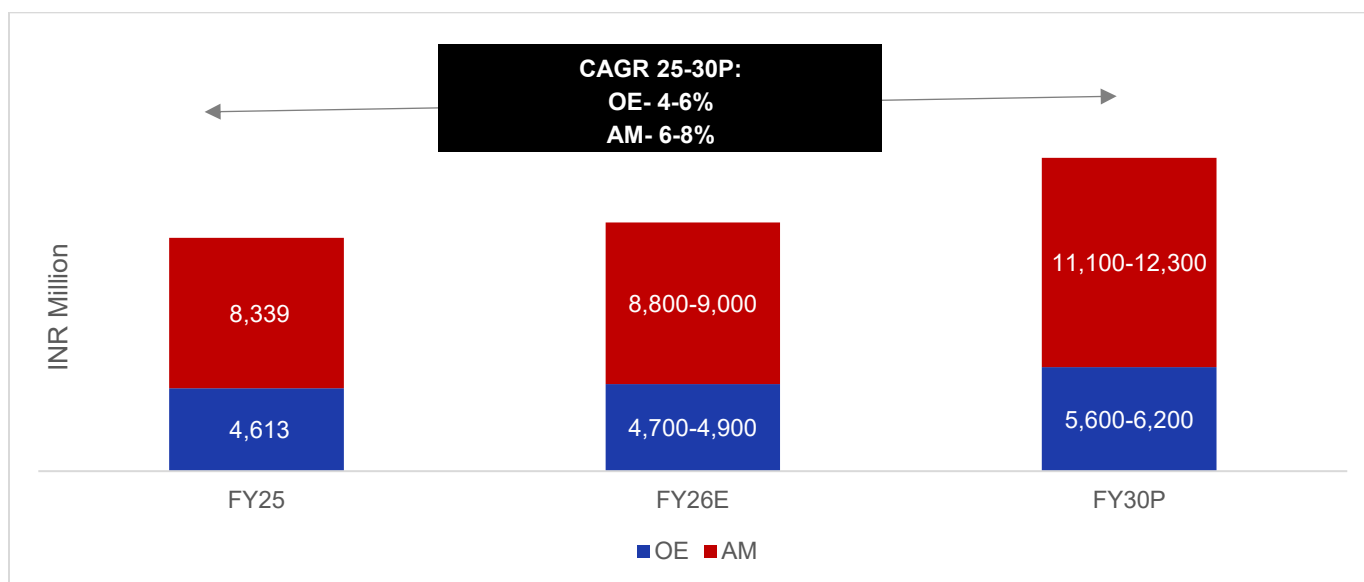
Spark plug is the device responsible for initiating combustion process in petrol engines. Typically, spark plugs are positioned toward the top of the cylinder head. The housing (having multiple components), insulators, and electrodes are the three primary components of a spark plug.



Source: Champions (Tenneco)

Review and Outlook on the domestic Spark Plug Industries, fiscal 2025-30P

Domestic OE and AM Spark plug market size (fiscal 2025-30P)



Note: E: Estimated, P: Projected
Spark plug market estimates include
For OE: 2W,3W, SCV and PV

For AM: 2W,3W, SCV and PV

Source: CRISIL Intelligence

The spark plug market including the sale of domestic OEMs and aftermarket is estimated at INR 4,613 million in fiscal 2025. Domestic OE market is expected to grow at 4-6% CAGR over the fiscal 2025-30 to reach INR 5,600-6,200 million in fiscal 2030. The market would be majorly accelerated by fast growing passenger vehicle segment followed by two-wheeler, three-wheeler and small commercial vehicle.

PV OE segment stood at INR 2,796 million and AM stood at INR 3,247 million and it is expected to grow at a CAGR of 2-4% for OE and 7-9% for AM from 2025 to 2030. For others segment (2W, 3W and SCV) OE segment stood at INR 1,816 million and AM stood at INR 5,092 million and it is expected to grow at a CAGR of 6-8% for OE and 6-8% for AM from 2025 to 2030.

Key growth drivers and trends impacting the Domestic Spark plug market

Implementation of BS VI emission norms

- BSVI engines require higher quality spark plugs with precious metals like platinum and iridium, which can withstand the increased combustion pressure and temperature.
- BS VI engines are designed for better fuel efficiency and lower emissions. The spark plug plays a crucial role in achieving these goals, leading to increased demand.
- Growing demand for gasoline direct engines has been adopted, which requires specialized spark plugs.
- BS VI norms have emphasized the importance of regular maintenance and servicing. This has led to an increase in spark plug replacement, driving growth for the market.

Increased demand for CNG specific spark plug

- CNG vehicles require fewer spark plugs compared to petrol. The CNG engines typically use single spark plug per cylinder whereas petrol engines use multiple spark plugs.
- CNG engines require specialized spark plugs designed to adapt to the higher combustion pressure and temperature associated with CNG combustion. This will lead to demand for specialized spark plugs designed for CNG vehicles.
- BSVI norms have played a significant role in supporting the growth of CNG vehicles. Strict emission norms of BSVI have made CNG vehicles a more attractive option.
- CNG penetration in PV has increased from 7% in FY2020 to 17% in FY2025. CNG powered PV clocked 19% CAGR over the fiscal 2020-25.

Rising vehicle population and advanced engine technology

India's vehicle population is increasing rapidly, driven by rising incomes, urbanization and growing demand for transportation. The domestic sale of passenger vehicle expected to increase by 5% CAGR over the fiscal 2025-30. Advance engine technology such as gasoline direct injection (GDI) and turbocharging requires the use of specialized spark plug that can tolerate higher engine pressure and temperature. Demand for strong hybrid vehicles also increased significantly in fiscal 2024, which requires spark plug that can optimize engine efficiency, reduce emission and improve fuel economy. The increasing vehicle penetration and advanced technology will lead to an increase in demand for spark plugs.

Strong replacement market

As vehicles become more reliable and durable, their lifespan increases. This results in more vehicles requiring spark plug replacement and hence it accelerates the overall demand. Also, the growing vehicle population creates large

aftermarket for ignition systems components, driving demand. The competitive market for the ignition system including pricing strategies affects the overall demand. The aftermarket is driven by cost considerations, with customers and mechanics alike seeking to reduce expenses by choosing lower-cost spark plug materials like copper and nickel. In the independent aftermarket, mechanics often make purchasing decisions based on price, favoring more economical spark plug options to maintain competitive pricing for their services.

Emerging trends in spark plug industries

- Increasing adoption of CNG, LPG and hybrid vehicles drives the demand for specialized spark plugs. which accelerates the overall spark plug demand.
- Increasing demand for fuel efficiency and high-performance vehicles drives the demand for advanced ignition systems. The growing demand for hybrid vehicles is driving demand for specialized spark plugs.
- Growing auto components e-commerce and online sales platforms are making it easier for consumers to purchase the products online in turn driving the demand for auto components.
- The demand for platinum and iridium spark plug is increasing due to their superior performance, durability and fuel efficiency, particularly advanced engines.
- Modern engines operate at higher combustion temperatures, leading to greater electrode wear. Platinum and iridium, known for their heat resistance and durability, are increasingly used to support this condition.
- The rise in hybrid vehicles, which require different types of sparks plugs than traditional gasoline engines, is driving the demand for platinum and iridium spark plugs.
- The Auto manufacturers are inclined towards more efficient and cleaner-burning engines to comply with stricter emission regulations globally, further driving demand for advanced spark plug technologies.

Company overview of key players

Key players in the Spark plug market are Bosch, Niterra India PVT LTD. (formerly known as NGK), Tenneco India (Champion), and Denso India PVT LTD. Based on sales channel, the market is divided into OE and aftermarket segments. The Indian spark plugs market features a mix of domestic and international players. Companies like Denso, Bosch, NGK, Tenneco (Champions) have significant presence. The organized market contributes 75-80% of the total Spark plug market and these companies' supplies are preferred suppliers to leading OEMs such as Bajaj Auto, Hero Honda, Yamaha, T.V.S., Kinetic, Maruti, Hindustan Motors, Piaggio Auto Limited and Mahindra & Mahindra.

Bosch: Bosch is a brand known for their advanced ignition coil that enhances engine efficiency and reliability. Bosch have some specialized spark plugs to meet high demand for turbocharged gasoline direct injection engines. They also have double iridium and double platinum spark plugs to meet high engine performance and longer service life.

Denso: Provides innovative solution with a focus on high quality material and cutting-edge technology ensuring optimal ignition and reduced emissions. Denso spark plugs use iridium alloy for their center electrode because of its extremely narrow diameter. Denso sparks plug range available includes Nickel, Iridium Power and Nickel TT plugs and the end user industry includes passenger cars, commercial vehicles and two wheelers.

NGK: Specializes in precision engineered ignition coils catering to various vehicle types, promoting smoother engine starts and better overall performance. Spak plug is categorized based on material such as Iridium, Platinum and Copper/Nikel. Based on end user applications distinguish OEM, racing and CNG/LPG fuel types. NGK sparks plug

majorly supplies to all esteem OEMs and most demanding products in the aftermarket. It supplies to all prominent vehicle categories such as Passenger cars, two-wheelers, three-wheelers.

Tenneco India (Champion): Champion is one of Federal Mogul's flagship brands, known globally for its spark plugs, filters, wipers, and other ignition products. In 2018, Federal Mogul was acquired by Tenneco Inc., and then Champion continues to operate under Tenneco's umbrella within its Motor parts division. Champion manufactures spark plugs for PVs, 2W and Industrial applications.

Review and outlook of domestic Bearings and Sealings components

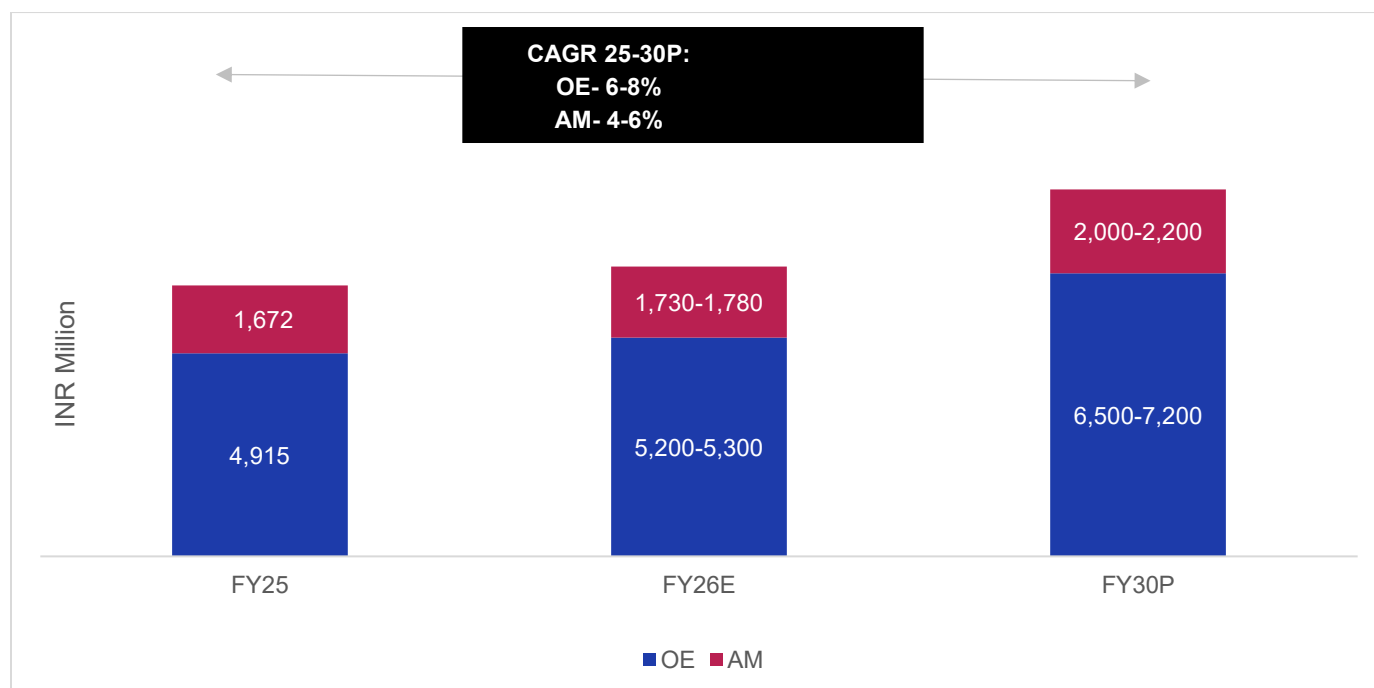
Bearings

Bearings play a critical role in an automobile by reducing friction between moving parts, supporting loads, and ensuring smooth operation. They are used in various components, including the engine, wheels, transmission, and suspension. Below is a comprehensive breakdown of different types of bearings in an automobile.

Engine Bearing products market size (fiscals 2025-30P)

The domestic OE engine bearings market is estimated at INR 4,915 million in FY25 and is expected to grow at a CAGR of 6-8%, reaching INR 6,500-7,200 million by FY30. Growth will be driven by increased vehicle production across segments, including passenger vehicles, CTs, off-highway vehicles, and tractors. The PV accounts for a significant portion, with an estimated INR 2,782 million market in FY25 in OE demand, while CTs & off-highway vehicle (OH + tractors) market is estimated at INR 1,044 million and INR 789 million in FY25.

Domestic OE and AM Engine Bearings market size (fiscal 2025-30P)



Note: E: Estimated, P: Projected

OE market size includes PV, SCV, CT, OH and tractors

AM market size includes 2W,3W, PV and SCV

Source: CRISIL Intelligence

The domestic bearings market is led by the passenger vehicle (PV) segment, which holds the largest revenue share at 57%, driven by growing vehicle production, increasing demand for fuel efficiency, and the adoption of advanced bearing technologies. Tractors account for 14% of the market, supported by consistent demand in the agriculture sector and increasing mechanization while Small commercial vehicle (SCV) segment contributes 6%. Meanwhile, CTs

and off-highway vehicles hold 21% and 2% shares respectively, with demand primarily driven by infrastructure development and construction activities. As industries continue to evolve, the need for high-performance, durable bearings is expected to rise across all vehicle segments.

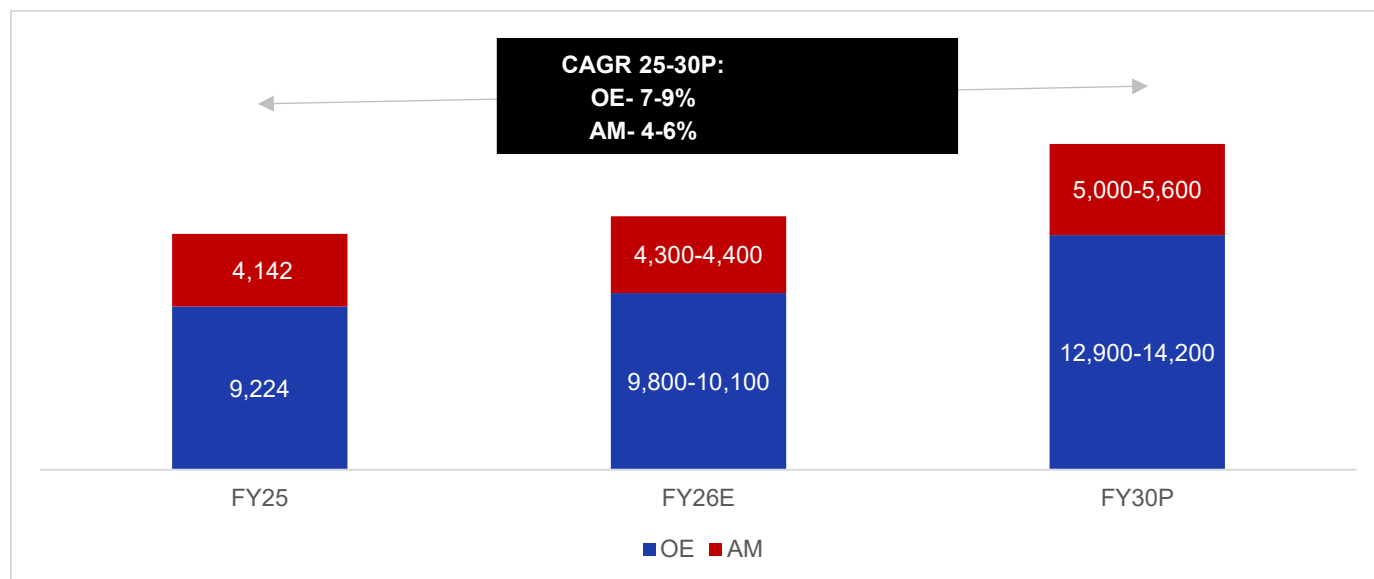
Domestic AM Engine Bearings market, value in INR Million, FY25-30P

Domestic market size of AM is estimated at INR 1,672 million in FY25 and it is expected to reach INR 2,000-2,200 million in FY30 with a CAGR of 4-6% between FY25 to FY30. The aftermarket segment is driven by the replacement cycle and vehicle parc. The improving rural economy and growing use of two-wheelers in last-mile delivery by e-commerce players/food chains will increase two-wheeler miles driven, supporting the AM segment.

Engine Sealings

Gaskets and seals that prevent leaks of oil, coolants, and gases while ensuring proper compression and efficiency in an engine. They include the cylinder head gasket, turbo gasket, heat shield, cold gasket and exhaust system gasket, each playing a critical role in maintaining engine performance and reliability.

Domestic OE and AM Engine Sealings market size (fiscal 2025-30P)



Source: Crisil Intelligence

Note: OE includes PV, SCV, CT, OH and tractors only.

Components included in sealings are:

Cold gaskets

Heat shield

Cylindrical head gasket

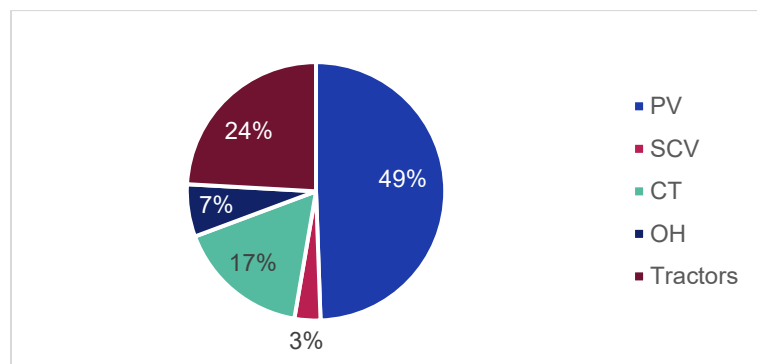
Turbo gasket

Exhaust system gasket

The sealings market is poised for growth, driven by rising demand for durable and high-performance components in the automotive sector with OE market size expected to expand from INR 9,224 million in FY25 to INR 12,900-14,200 million by FY30, reflecting a CAGR of 7-9% during FY25-30. This growth is supported by advancements in sealing materials, increasing adoption in hybrid and CNG vehicles, and stringent emission regulations. As manufacturers focus

on improving thermal resistance, durability, and sealing efficiency, the sector is expected to witness sustained expansion in the coming years.

Fig: Domestic engine sealings market, revenue share (%), vehicle category, FY25 (Only OE Demand)



Source: Crisil Intelligence

Indian sealings market is led by passenger vehicles, which account for 49% of the total revenue share in FY25. Major dominance is driven by the high demand for durable and high-performance sealing solutions in SUV segment. CTs holds a significant share of 17% since CTs operate under extreme conditions, requiring advanced sealing technologies to ensure engine efficiency, prevent leakage, and enhance vehicle longevity is a must. Additionally, the expansion of logistics, infrastructure projects, and growing freight movement in India have further boosted demand for truck components, including sealings.

Off-highway segment holds a 7% share, driven by increased mechanization in agriculture and infrastructure development. The tractor segment also demands a share of 24%, reflecting the sector's dependence on robust sealing technologies for engine reliability and hydraulic systems.

Domestic market size of AM is estimated at INR 4,142 million in FY25 and it is expected to reach INR 5,000-5,600 million in FY30 with a CAGR of 4-6% between FY25 to FY30. Major share of the AM is driven by PV segment and 2W segment.

Brief overview: Bearing & Sealing players

Daido: Daido Metal Co. Ltd. is one of the leading Japanese manufacturers specializing in plain bearings for a wide range of applications, including automotive, industrial, marine and aerospace sectors. Daido Metal is renowned for its expertise in plain bearing technology, especially in supplying engine bearings, thrust washers, and bushings to Japanese automobile manufacturers and major global OEMs.

Bimetal Bearings Ltd.: BBL is a prominent Indian manufacturer specializing in high-performance engine bearings and related components, established in 1961 in collaboration with Clevite Inc. USA, and Repco Ltd. Australia. BBL is a key member of the amalgamations group – one of India's largest engineering conglomerates. BBL offers a comprehensive range of products catering to various automotive and industrial applications such as crankshaft bearings and connecting rod bearings.

Taiho: Taiho Kogyo Co. Ltd. is a renowned Japanese manufacturing specializing in high-precision engine bearings and related automotive components. Established in 1944 and headquartered in Toyota city, Aichi Prefecture, Japan, the company has a significant presence in the automotive industry, particularly as a Tier-I OEM supplier to major automakers. Taiho Kogyo's product lineup includes main bearings, connecting rod bearings, and thrust washers.

Talbro: Talbro is a prominent Indian automotive components group comprising two key companies: Talbro Automotive Components Ltd. (TACL) and Talbro Engineering Ltd. (TEL). Both entities are integral to India's auto ancillary sector. Supplying a diverse range of components to OEMs and global markets. Headquartered in Haryana, TACL is renowned for its extensive product portfolio including multi-layer steel (MLS), rubber-molded and heat shield gaskets.

Elring Klinger: Elring Klinger, a German automotive supplier renowned for its expertise in sealing and shielding technology, lightweight components, and e-mobility solutions. Founded in 1879 and headquartered in Dettingen an der Erms, Germany has approx. 45 locations worldwide, including a facility in Ranjangaon, India. Key areas of expertise include sealings and shielding technology, lightweight components, e-mobility solutions, and tooling.

Tenneco: Tenneco's bearings and sealings solution are critical component engineered to enhance engine efficiency, durability and thermal performance. These components are integral to ensuring long-term reliability in powertrain systems across multiple vehicle categories. In the Indian market, Tenneco has carved out a stronghold in the PV segment, where its bearing systems are used in nearly half of the applications. The brand holds a solid presence in CT space, underlining its expertise in supporting high-load, high-mileage operations.

Operational and financial profiling of key automotive component players competing with Tenneco.

Key player profiles

Key players in ignition solutions, clean air solutions, suspension solutions, bearings and sealings are Tenneco, SKF India Pvt Ltd, Sona BLW, Bosch Ltd, Gabriel, and Sharda Motor Industries Ltd.

SKF India Pvt Ltd

Key facts	Brief profile
<p>Year of incorporation: 1961</p> <p>HQ: Pune, India</p>	<p>SKF India Ltd was incorporated in the year 1961. SKF India is a part of the SKF Group, a leading global supplier of rolling bearing and seals. It also offers extensive solutions and services in this area. Over the last century, SKF has grown from being a bearings manufacturer to being a system/subsystems and solution provider. SKF India provides products, solutions and services in the areas of rolling bearings, seals, mechatronics, services, and lubrications systems.</p> <p>Capacity: Total capacity-190 million bearings</p> <p>Manufacturing Facilities -</p> <ol style="list-style-type: none"> 1.Bengaluru-1 2.Haridwar-1 3.Pune-1 <p>Apart from 3 manufacturing facilities SKF India Limited has 8 warehouses and 4 solution factories</p> <p>SKFs Aftermarket business contributes 47% of the total sales as on fiscal 2024.</p> <p>Exports: Exports are INR 3,783 million, which is about 8 % per cent of the total sales in FY24</p> <p>Global presence: Presence in 5 continents and 130 countries</p> <p>Key clients: Tata Motors, Mahindra & Mahindra, Bajaj Auto, TVS, Yamaha, John Deere and Maruti Suzuki.</p>

Source: Company annual report

Sona BLW Precision Forgings Ltd

Key facts	Brief profile
<p>Year of incorporation: 1990</p> <p>HQ: Gurugram, India</p>	<p>The company is an automotive systems and components manufacturer. The company is involved in designing, manufacturing and supplying engineered automotive systems and components such as differential assemblies, gears and conventional and micro hybrid motors, BSG system and EV traction motors across all vehicle categories. The company develops mechanical and electrical hardware systems, components as well as base and application software solutions.</p> <p>Capacity:</p> <ol style="list-style-type: none"> 1. Gears-60.2 million 2. Strater motors-5.8 million 3. Differential assemblies-2.5 million 4. Traction motors- 0.4 million <p>Manufacturing Facilities:</p> <ol style="list-style-type: none"> 1.Gurugram, Haryana-3 2.Chennai, Tamil Nadu-1 3.Pune, Maharashtra-1 4.Manesar, Haryana-1 <p>Exports: The contribution of exports to total turnover of the entity is 57% in FY25.</p> <p>Global presence: Presence in 3 continents and 7 countries including China, U.S.A, Mexico, Belgium, Serbia, Germany and India</p> <p>Key clients: Maruti Suzuki, Tata, TAFE, Mahindra & Mahindra, ITL, John Deere, Escorts, DICV Trucks India, Volvo Eicher, and New Holland India</p>

Source: Company annual report

Bosch Ltd.

Key facts	Brief profile
<p>Year of incorporation: 1951</p> <p>HQ: Bengaluru, Karnataka</p>	<p>Bosch India Ltd, formerly known as Motor industries company Ltd (MICO) was established in 1951. The company is a subsidiary of Robert Bosch GmbH, the global parent company. Bosch Ltd is one of the India-based auto component manufacturing company. The company has presence in three business sectors, including Automotive Technology, Industrial Technology and Consumer Goods and Building Technology. The company manufactures diesel and gasoline fuel injection systems, automotive aftermarket products, auto electrical, special purpose machines, packaging machines, electric power tools and security systems.</p> <p>Capacity: The company has 17 manufacturing sites and seven development and application centers.</p> <p>Manufacturing facility:</p> <ol style="list-style-type: none"> 1. Gangaikondan, Tamil Nadu-1 2. Nashik, Maharashtra-1 3. Naganathapura, Karnataka-1 4. Bidadi, Karnataka-1 5. Jaipur, Rajasthan-1 6. Chennai, TamilNadu-1 <p>Domestic: The independent aftermarket segment (IAM) contributes 60% of the total mobility after-market business. The Mobility Aftermarket segment has 50,000 retail touchpoints, spread across 650+ districts, as on FY2025. They have 15,000 authorized workshops and service centers.</p> <p>Exports: The contribution of exports to total mobility business is 9% respectively in FY24.</p> <p>Global presence: Asia, Europe and North America. Bosch Ltd is largest development center in India outside of Germany.</p> <p>Key clients: Bajaj, TVS, Tata Motors, Maruti Suzuki, Audi, Mercedes-Benz, BMW, and Jaguar Land Rover.</p>

Source: Company annual report

Gabriel

Key facts	Brief profile
<p>Year of incorporation: 1961</p> <p>HQ: Pune, Maharashtra</p>	<p>Gabriel India Limited is the flagship company of the Anand group, was established in 1961. The company operates through auto components and parts business segment. The end user industry includes commercial vehicles, 2-wheelers, 3-wheelers, passenger cars, railways and aftermarket. The company manufactures a wide range of products such as shock absorbers, struts and front forks for multiple automotive segments. It manufactures front forks and rear shock absorbers for two-wheelers, McPherson struts and shock absorbers for passenger cars, cabin dampers, seat dampers and suspension shock absorbers for commercial vehicles, and shock absorbers for railway coaches. The distribution network connects 700+ dealers and 20,000 retailers across pan India.</p> <p>Capacity: overall production capacity of 40 million units (As of FY'22)</p> <ol style="list-style-type: none"> Shock absorbers and Struts-24 million <p>Front Forks - 2.7 million</p> <p>Manufacturing Facilities:</p> <ol style="list-style-type: none"> Mulund, Nasik and Pune-Maharashtra-3 Dewas-Madhya Pradesh-1 Hosur-Tamil Nadu-1 Khandsa and Gurgaon-Haryana-2 Parwanoo-Himanchal Pradesh-1 <p>Domestic: The OEM constitutes 86% of the overall domestic business, 11% by domestic aftermarket business and 3% by export as of FY25. Shocks and struts generate 88% of the total aftermarket business.</p> <p>Exports: The contribution of exports to total turnover of the company is 3% in FY25.</p> <p>Global presence: Asia, USA & North America, South America, Europe, Africa and Australia. Gabriel India established Gabriel Europe Engineering Centre as subsidiary.</p> <p>Key clients: Mahindra, Tata motors, Skoda, Toyota, Volkswagen, Maruti Suzuki, TVS, Ather, Ola, and others.</p>

Sharda Motor Industries Limited (SMIL)

Key facts	Brief profile
<p>Year of incorporation: 1986</p> <p>HQ: Delhi, New Delhi</p>	<p>Founded in 1986, SMIL is an auto-ancillary company with global operations. The company offers highly engineered products and services ranging from emission to suspension systems, roof systems and supply chain management solutions. The company caters to end-use industries such as passenger vehicles, farm equipment, commercial vehicles and gensets. The company caters to both domestic as well as international customers. The company has a comprehensive range of products, including advanced exhaust systems, high-performance suspension components, efficient roof systems, and others.</p> <p>Annual Capacity:</p> <ol style="list-style-type: none"> 1. Exhaust systems - ~1 million units 2. Suspension systems - ~1.8 lakh units <p>Manufacturing Facilities:</p> <ol style="list-style-type: none"> 1. Sanand-Gujarat -1 (for exhaust system) 2. Nashik-Maharashtra-2 (for exhaust systems, roof systems and suspension assembly) 3. Chakan-Maharashtra-3 (for exhaust systems and suspension assembly) 4. Chennai-Tamil Nadu-2 (for exhaust system and tube mills) <p>Domestic: SMIL's market is majorly domestic by geography. The OEM constitutes 99.2% of the overall domestic business as of FY25.</p> <p>Exports: The contribution of exports to the total turnover of the company is 0.84% in FY25.</p> <p>Global presence: Entered a technical partnership with Bestop Inc. USA for manufacturing roof systems. Eberspacher Germany and SMIL entered a joint venture to manufacture commercial vehicle exhaust systems in >4 liters category in India. Dedicated Design & Development center at Namyang, South Korea</p> <p>Key clients: Hyundai, Mahindra & Mahindra, Tata Motors, Ashok Leyland, Nissan, TAFE, Sonalika, Kubota, Magna, MAN, Isuzu, Force Motors, Cummins, Kirloskar and JCB</p>

Source: Company annual report

Tenneco India

Key facts	Brief profile
<p>Year of incorporation: 1986</p> <p>HQ: Hosur, Tamil Nadu</p>	<p>Tenneco established manufacturing operations in India in 1995. Tenneco Automotive India Pvt Ltd is a subsidiary of Tenneco Inc., a global manufacturer and distributor of automotive products. It specializes in emissions control systems, powertrain technologies, and performance solutions for various vehicles, including light vehicles, CTs, and off-highway equipment. The company is involved in the design, manufacturing and selling of automotive products for OE and the aftermarket for both domestic and international customers. Tenneco India is part of the Tenneco group, a U.S. headquartered key global Tier-I automotive component supplier</p> <p>Capacity:</p> <p>Manufacturing Facilities: Parwanoo-Himachal Pradesh -1 (for bearings), Bhiwadi-Rajasthan-1 (for ignition), Pithampur-Madhya Pradesh-1 (for clean air), Pune-Maharashtra-1 (for sealings), Chakan I & II-Maharashtra-2 (for clean air) and Chennai-Tamil Nadu-1 (for clean air)</p> <p>Domestic: Tenneco's market is majorly domestic geography. The OE constitutes 84% of the overall business as of FY24. PV category was a major contributor for the overall OE category followed by commercial vehicles. Aftermarket is majorly driven by the suspension products for PV market.</p> <p>Exports: The contribution of exports to total turnover of the company is 3% in FY24.</p> <p>Global presence: Tenneco is a multi-national corporation with 93 manufacturing facilities in 26 countries located on 6 continents, with major centers of operations in the Americas, Europe, India and Asia.</p> <p>Key clients: Maruti Suzuki, Ford, Nissan, Hyundai, KIA, Cummins, Volvo Eicher, JCB, Bajaj, Volkswagen, Tata Motors, Mahindra & Mahindra, Club Car, and TVS Motor.</p>

Source: Company annual report

Note: Tenneco Group refers to Tenneco LLC and its consolidated subsidiaries

Table of Ranking – Basis FY2025 (in terms of value) (revenue)

Category/ Vehicle Segment	Market Share	Market Ranking
Clean air solutions		
<i>PV</i>	19%	Top 4
<i>CT</i>	57%	Leader
<i>OH*</i>	68%	Leader
Shock absorbers & struts		
<i>PV</i>	52%	Leader
Engine Bearings		
<i>PV</i>	44%	Top 2
<i>CT</i>	34%	Top 2
Sealings		
<i>PV</i>	14%	Top 7
Ignition		
<i>PV</i>	18%	Top 5

*Excludes Tractors

Uno Minda Limited

Key facts	Brief profile
<p>Year of incorporation: 1958</p> <p>HQ: Gurgaon, Haryana</p>	<p>Established in 1958, Uno Minda, formerly known as Minda Industries, manufactures of auto components and systems. The company has diversified product portfolios such as acoustics, switches, castings, lighting, Air filtration, automotive seating system and alloy wheel. They design and manufacture over 25 categories of components and systems for all vehicle segments such as PV, two wheelers, three wheelers and CVs catering to both ICE and EV/hybrid vehicles. The company has more than 6500 SKUs switches, horns, lighting batteries, filters, indicators, bulbs, RVMs, shocks and struts and accessories. Their distribution network connects 54,000 retailers and 75,000 service points, covering 559 cities across India as on fiscal 2024.</p> <p>Annual Capacity: 2W alloy wheels (Supa, Maharashtra) - ~7.5-8 million units 4W alloy wheels - ~4.6 million units</p> <p>Manufacturing Facilities: Total 66 manufacturing plants located across India –</p> <p>Manesar (8), Bawal (10), Neemrana (1), Bhiwadi (1), Bahadurgarh (2), Sonipat (1), Pantnagar (3), Haridwar (1), Farukhnagar (1), Baddi (1), Noida (1), Gujarat (8), Chakan (7), Waluj (1), Pitampur (1), Ranjangoan (1), Supa (1), Jamshedpur (3), Begaluru (3), Narsapur (1), Chennai (5), Hosur (5), Mysuru (2)</p> <p>Domestic: Uno Minda caters majorly for domestic geography. OEM constitutes 93% and aftermarket share 7% of the overall domestic business as of FY24.</p> <p>Exports: The contribution of exports to total turnover of the company is 13% in FY24.</p> <p>Global presence: Indonesia, Vietnam, Germany, Spain, Mexico. R&D and engineering centers located in India, Germany, Japan, Taiwan, Korea and Spain and technical agreements and Joint venture with world renowned manufacturers from Japan, Germany, Korea and China</p> <p>Key clients: Maruti Suzuki, Renault Nissan, Mahindra & Mahindra, Royal Enfield, Yamaha, Tata Group, Bajaj, Isuzu, Swaraj Mazda, New Holland, Triumph and KTM.</p>

Source: Company annual report

Timken Limited

Key facts	Brief profile
<p>Year of incorporation: 1987</p> <p>HQ: Bangalore, Karnataka</p>	<p>Timken India Limited was incorporated in 1987 as Tata Timken Limited (TTL), a joint venture between Tata Iron and Steel Company (TISCO) and The Timken Company. It commenced commercial production at its Jamshedpur plant in March 1992. The company manufactures tapered roller bearings, other roller bearings, components, accessories and mechanical power transmission products. The company also provides maintenance contracts, and refurbishment services and majorly supplies to automobile, engineering and railway sectors.</p> <p>Annual Capacity: 2.4 million units of tapered roller bearing particularly those smaller than 8 inches which are used by heavy trucks and trailer customers as of 2010.</p> <p>Manufacturing Facilities: Jamshedpur (1), Bharuch (1)</p> <p>Domestic: The domestic business comprises 66% engineered bearings and 34% industrial motion products. The distribution channel constitutes 55% of OEM customers and 45% distributors/end users as on Fiscal 2024.</p> <p>Global presence: The company operates from 45 countries. They have strong presence in North America, Europe and Middle East, Africa, Asia and Latin America.</p> <p>Key clients: Tata Motors, Ashok Leyland, Dana, Fiat, Escort, New Holland, Indian railways, Titagarh wagons.</p>

Source: Company annual report

ZF Limited

Key facts	Brief profile
<p>Year of incorporation: 1981</p> <p>HQ: Pune, Maharashtra</p>	<p>ZF India was established as ZF Steering gear (India) Ltd, a joint venture with ZF Lenksysteme GmbH. Initially the company focused on manufacturing and supplying integral hydraulic power steering systems. ZF India is a supplier of technology solution and service provider in the mobility sector. The company has a strong presence in the automotive and industrial segments with expansive manufacturing and engineering footprints. The company manufactures active and passive safety systems, steering system, clutch system, axle system, chassis and suspension components for commercial vehicles, powertrain and chassis components, safety devices for light vehicle industry and gear boxes for wind turbine industry. The company serves majorly PV, CV and the other market segments such as construction and agriculture machinery, wind power, marine propulsion, rail drives and test systems. The company operates through 14 entities including one joint venture partner.</p> <p>Annual Capacity: Shock absorber (Chakan, Pune) - ~0.7 million units (as on Fiscal 2018) front suspension, rear axle, corner module for PV (Chennai) - ~12,500 units</p> <p>Manufacturing Facilities: The company having 18 manufacturing facilities and 10 engineering centers across India including Pune, Chennai, Coimbatore and Gurugram.</p> <p>Global presence: The company operates from 30 countries.</p> <p>Key clients: Ashok Leyland, Daimler India commercial vehicle, Force Motors, Mahindra Trucks and Buses, Tata Motors and Volvo group.</p>

Source: Company annual report

Key financial indicators for fiscal Q1 2026

	Tenneco India	Bosch Ltd	Timken India Ltd	SKF India Ltd	ZF Commercial Vehicle Control System India Ltd	Sharda Motor Industries Ltd	Gabriel India Ltd	UNO Minda Ltd	Sona BLW Precision Forgings Ltd	Average
Revenue from Operations (INR million)	12,856.21	47,886.00	8,088.17	12,831.50	9,755.60	7,562.48	10,983.80	44,890.90	8,539.10	NA
Revenue Growth, Q-on-Q (%)	1.17%	10.93%*	3.20%*	6.38%	3.15%	10.33%	16.04%	17.59%*	-4.18%	7.18%
EBITDA (INR million)	2,288.80	6,393.00	1,523.70	1,825.40*	1,981.68	984.00	1,084.00	5,430.00	2,025.00	NA
EBITDA Growth, Q-on-Q (%)	7.50%	23.01%	-0.30%*	-21.86%*	20.70%*	2.82%*	19.38%*	33.09%*	-19.39%*	7.21%
EBITDA Margin (%) Basis Revenue from Operations	17.80%	13.35%*	18.84%*	14.23%*	20.32%*	13.01%*	9.87%*	12.10%	23.71%*	15.91%
PAT (INR million)	1,680.88	11,153.00	1,042.24	1,182.10	1,223.76	999.40	619.72	3090.30	1,217.09	NA
PAT Growth Q-on-Q (%)	11.83%	139.64%*	8.22%*	-25.62%*	23.08%*	30.08%*	7.61%*	46.60%*	-14.12%*	25.26%
PAT Margin (%) Basis Revenue from Operations	13.07%	23.29%*	12.89%*	9.21%*	12.54%*	13.22%*	5.64%*	6.88%	14.25%*	12.33%
Net Debt (INR Million)	(3,475.69)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Net Debt to Equity Ratio	(0.22)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Net Debt to EBITDA Ratio	(1.52)	NA	NA	NA	NA	NA	NA	NA	NA	NA
Return on Equity	10.44%	NA	NA	NA	NA	NA	NA	NA	16.50%	NA
Return on Capital Employed	16.29%	NA	NA	NA	NA	NA	NA	NA	19.10%	NA
Fixed Asset Turnover Ratio (Times)	2.31	NA	NA	NA	NA	NA	NA	NA	2.90	NA
Net Working Capital (INR million)	1,550.77	NA	NA	NA	NA	NA	NA	NA	NA	NA
Net Working Capital Days	11.00	NA	NA	NA	NA	NA	NA	NA	NA	NA

Cash Conversion Cycle (Days)	(23.00)	NA	NA	NA	NA	NA	NA	NA	NA	NA
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Source: Company reports, ROC, Crisil Intelligence

1. The financial statements are consolidated except for Timken India
2. (*) denotes numbers which are calculated using the below stated formulas. Other financials metrics are sourced from the company annual report or Investor presentations.
3. The above stated peer average may not be representative of the industry average. This average is calculated for the above listed sample set only.
4. Revenue from Operations is calculated as Revenue from operation for the period / year
5. Cash Conversion Cycle is calculated as the sum of Receivable Days and Inventory Days less Payable Days, rounded to the nearest whole number.
6. Receivable Days are calculated as average trade receivables divided by (revenue from operations divided by 365), rounded to the nearest whole number.
7. Inventory Days is calculated as average inventories divided by (cost of goods sold divided by 365), rounded to the nearest whole number.
8. Gross Margin = (Revenue from Operations – Cost of Goods Sold)/ Revenue from Operations
9. Cost of Goods sold = Cost of Materials Consumed + Purchases of Stock-in-trade + Change in Inventories of Finished goods, work-in-progress and stock-in-trade
10. EBITDA: EBITDA is calculated as restated profit for the period/ year plus tax expenses, finance costs, depreciation and amortization expenses and exceptional items less Other Income.
11. EBITDA Margin (%) = percentage of EBITDA divided by Revenue from Operations
12. PAT: Profit after tax for the financial year.
13. PAT margin = calculated as Profit after tax divided by Revenue from Operations
14. ROCE: calculated as Earnings before interest and taxes / Capital Employed
15. ROE: calculated as [Net Profits after taxes – Preference Dividend (if any)] / Average Shareholder's Equity
16. Net Debt to Equity = (Total Debt + Lease liability) - Cash / Shareholder's Equity
17. Net Debt to EBITDA = ((Total Debt+ Lease Liability) - Cash) / EBITDA
18. Fixed Assets Turnover Ratio = Revenue from operations / Average Net Fixed Assets
19. Net capital turnover ratio = Revenue from Operations / Net Working Capital
20. Net Working Capital is calculated as Current Assets (excluding assets classified as held for sale) less Current Liabilities (excluding liabilities relating to assets held for sale), along with receivables related to sale of Motocare business classified under other receivables as per Restated Consolidated Financial Information.

Key financial indicators for fiscal 2025

	Tenneco India	Bosch Ltd	Timken India Ltd	SKF India Ltd	ZF Commercial Vehicle Control System India Ltd	Sharda Motor Industries Ltd	Gabriel India Ltd	UNO Minda Ltd	Sona BLW Precision Forgings Ltd	Average
Revenue from Operations (INR million)	48,904.30	1,80,874.00	31,478.10	49,199.00	38,309.62	28,365.71	40,633.81	1,67,746.10	35,460.21	-
Revenue Growth (%)	-10.56%	8.13%	8.19%	7.65%	0.40%	0.97%	19.42%	19.55%	11.34%	7.23%
EBITDA (INR million)	8,152.39	23,097.00	6,418.00	8,468.80	7,390.00	3,964.00	3,917.00	18,740.00	9,753.00	-
EBITDA Growth (%)	33.19%	10.26%*	4.66%*	4.35%*	11.80%*	9.68%*	33.87%*	18.21%*	8.11%*	14.90%
EBITDA Margin (% Basis Revenue from Operations)	16.67%	12.77%*	20.39%	17.21%*	19.29%*	13.97%*	9.64%*	11.17%*	27.50%*	16.51%
PAT (INR million)	5,531.43	20,130.00	4,473.86	5,658.10	4,607.30	3,149.16	2,449.81	10,205.70	5,996.88	-
PAT Growth (%)	32.72%	-19.20%*	14.09%*	2.56%*	13.36%*	5.12%*	37.05%*	10.37%*	15.93%*	12.44%
PAT Margin (% Basis Revenue from Operations)	11.31%	11.13%*	14.21%*	11.50%*	12.03%*	11.10%*	6.03%*	6.08%*	16.91%*	11.15%
Net Debt (INR Million)	-2662.06	-3,896.00*	-3,808.59*	-7,119.10*	-14,015.27*	3,149.08*	56.32	22,749.80	-26,591.00	-
Net Debt to Equity Ratio	-0.17	-0.03*	-0.13*	-0.27*	-0.44*	0.30*	0.00	0.34	-0.48	-0.10
Net Debt to EBITDA Ratio	-0.33	-0.17*	-0.64*	-0.34*	-1.90*	0.79*	0.08*	1.22*	-2.73*	-0.45
Return on Equity	42.65%	15.56%*	17.00%*	21.43%*	15.35%*	30.00%	22.42%*	17.70%	17.70%	22.20%
Return on Capital Employed	56.78%	19.92%*	19.44%*	29.30%	19.12%*	38.00%	27.62%*	18.90%	18.40%	27.50%
Fixed Asset Turnover Ratio (Times)	8.37	9.02*	6.21	28.68*	5.12*	12.33*	6.63*	4.20	3.40	9.31
Net Working Capital (INR million)	1,778.29	48,564.00*	14,408.56	10,433.00	23,516.23*	7,847.49*	4,917.65*	10,467.30*	32,630.34*	-
Net Working Capital Days	13	4*	2*	16*	2*	4*	8*	16*	1*	7.31

Cash Conversion Cycle (Days)	-24	0*	97*	59*	71*	-27*	14*	24*	45*	28.81
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Source: Company reports, ROC, Crisil Intelligence

Note: Few financials for fiscal 2025 are updated based on the latest annual report (fiscal 2025) published by these companies

NA: Not Available

1. The financial statements are consolidated except for Timken India
2. (*) denotes numbers which are calculated using the below stated formulas. Other financials metrics are sourced from the company annual report or Investor presentations.
3. The above stated peer average may not be representative of the industry average. This average is calculated for the above listed sample set only.
4. Financials for Schaeffler India are not available.
5. Cash Conversion Cycle is calculated as the sum of Receivable Days and Inventory Days less Payable Days, rounded to the nearest whole number.
6. Receivable Days are calculated as average trade receivables divided by (revenue from operations divided by 365), rounded to the nearest whole number.
7. Inventory Days is calculated as average inventories divided by (cost of goods sold divided by 365), rounded to the nearest whole number.
8. Revenue from Operations is calculated as Revenue from operation for the period / year
9. Gross Margin = (Revenue from Operations – Cost of Goods Sold)/ Revenue from Operations
10. Cost of Goods sold = Cost of Materials Consumed + Purchases of Stock-in-trade + Change in Inventories of Finished goods, work-in-progress and stock-in-trade
11. EBITDA: EBITDA is calculated as restated profit for the period/ year plus tax expenses, finance costs, depreciation and amortization expenses and exceptional items less Other Income.
12. EBITDA Margin (%) = percentage of EBITDA divided by Revenue from Operations
13. PAT: Profit after tax for the financial year.
14. PAT margin = calculated as Profit after tax divided by Revenue from Operations
15. ROCE: calculated as Earnings before interest and taxes / Capital Employed
16. ROE: calculated as [Net Profits after taxes – Preference Dividend (if any)] / Average Shareholder's Equity
17. Net Debt to Equity = (Total Debt + Lease liability) - Cash / Shareholder's Equity
18. Net Debt to EBITDA = ((Total Debt+ Lease Liability) - Cash) / EBITDA
19. Fixed Assets Turnover Ratio = Revenue from operations / Average Net Fixed Assets
20. Net Working Capital Days = 365 Days/ Net capital turnover ratio
21. Net capital turnover ratio = Revenue from Operations / Net Working Capital
22. Net Working Capital Amount = Current Assets - Current Liabilities

Threats and Challenges

Historic Industry growth

The table below indicates the performance of the industry over the last 3 fiscals

Growth (%)	FY23-24	FY24-25E	FY23-25E CAGR
Passenger Vehicle	8%	1-3%	4-5%
Commercial Trucks	4%	-0.7-0.7%	1-3%
Tractors	-7%	7-8%	-0.3-0.3%
Construction Equipment	26%	3-4%	13.5-14.5%

Demand Side Challenges

Increase in vehicle cost of ownership

A vehicle's cost of ownership is determined by its cost of acquisition and cost of operations, and both have a significant impact on the demand. The cost of vehicle acquisition rises when OEMs transfer the impact of increased manufacturing costs to the customers. In the past, industry has seen price hikes owing to several reasons like implementation of emission norms, increase in raw material prices and general inflationary hikes. These are also likely to push vehicle prices upwards going forward. Auto finance rates are also pivotal in determining affordability. The cost of operations for a customer is directly impacted by fluctuations in crude oil prices and INR USD exchange rates, that cause rise in fuel import costs and overall fuel prices.

Inherent cyclicality of the domestic PV business

The passenger vehicle industry has close linkages with growth in GDP as well as business cycles impacting the incomes of probable customers thereby making the industry susceptible/vulnerable to these changes. This cyclical nature of the passenger vehicle industry poses constant challenges to the industry players and component suppliers as they have to constantly manage inventory optimally and profitably.

Inherent cyclicality of Commercial trucks and OH dependent Industries

The demand for commercial trucks and construction equipment are closely tied to economic growth. During periods of robust economic expansion, there is an increase in industrial output, infrastructure projects, and logistics activities, driving higher demand for commercial trucks and construction equipment. Conversely, during economic slowdowns, demand plummets as businesses reduce capital expenditures and transportation needs decline. For instance, the CT industry has seen 3 business cycles in the past 2 decades:

- FY04 to FY09 (peak in FY08)
- FY 09 to FY15 (peak in FY12)
- FY15 to FY 21 (peak in FY19)
- FY21 to ongoing

It has been seen that there can be a swing of more than 20-25% between the peaks and troughs of the business cycles of the CT Industry which in turn can makes business planning complicated for players involved in supply of components to the commercial trucks Industry.

Supply Side Challenges

Raw Material Availability and Cost

Cost Management: Fluctuating prices of raw materials like iron and steel pose significant challenges to managing costs. A sudden spike in prices, such as the increase in iron ore prices, can erode profit margins and make it difficult to offer competitive pricing to customers. Metal product manufacturers must either absorb these costs, reducing profitability, or pass them on to customers, potentially losing business to cheaper alternatives.

Supply Chain Disruptions: Volatile raw material prices can also lead to supply chain disruptions if suppliers are unable to secure consistent and affordable supplies. Also energy prices, coke prices and supply-demand balances can impact the raw material cost. This inconsistency can result in production delays and missed deadlines, damaging relationships with OEMs and other key clients.

Dependence on Imports

EV players rely heavily on imported components (e.g., lithium-ion cells, semiconductors), while ICE vehicles are affected by fluctuations in commodity prices (e.g., steel, aluminum). However, with growing electronic content in modern vehicles, ICE vehicles are also susceptible to semiconductor shortage.

Localization and Regulatory Barriers

Government initiatives (e.g., PLI, Atmanirbhar Bharat) require significant upfront capital investments, which some OEMs struggle to meet.

Increasing Competition

A surge in new entrants and portfolio expansions by legacy players intensifies competition, making customer acquisition challenging.

Skilled Labour Shortage

Skilled labour is one of the most important supply side aspects in the manufacturing sector. Training and retaining skilled workers in areas such as welding, fabricated assembly, surface finishing Industry is a key driving factor for success of any segment of the industry including Metal and Metal specific industry

Thus, inadequate availability of skilled labour can be one of the significant challenges impacting the Fabrication assemblies Industry in India. This shortage can span across various facets, from production to maintenance and innovation, ultimately affecting the industry's growth and global competitiveness.

Policy and Regulatory Challenges

Changes in tax and duties regime

Changes in duties and tax structures present significant threats to the automotive welding, tubular fabrication and fabricated assembly industry. These changes can have multifaceted impacts on cost structures, supply chains, and overall competitiveness.

This threat is particularly significant due to India's evolving tax landscape and the government's periodic adjustments to import duties and other taxes.

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