



Gears and precision components industry report

November 2025

Abhishek Maiti, Director
1Lattice

[Grab your reader's attention with a great quote from the document or use this space to emphasize a key point. To place this text box anywhere on the page, just drag it.]

DISCLAIMER

This material has been prepared by 1Lattice, which is the trade name of Lattice Technologies Private Limited ("1Lattice", "we" or "our") with the intent to showcase our capability and disseminate learnings to potential partners/clients. The report has been prepared as a general summary of matters on the basis of our interpretation of the publicly available information, our experiences and the information provided to us, and should not be treated as a substitute for a specific business advice concerning individual matters, situations or concerns. Procedures we have performed do not constitute an audit of the Company's historical financial statements nor do they constitute an examination of prospective financial statements. We have also not performed any procedures to ensure or evaluate the reliability or completeness of the information obtained from the Company. Accordingly, we express no opinion, warranty, representation or any other form of assurance on the historical or prospective financial statements, management representations, or other data of the Company included in or underlying the accompanying information. We have not carried out any financial, tax, environmental or accounting due diligence with respect to the Company.

GLOSSARY OF ABBREVIATIONS USED

S.No.	Abbreviation used	Full form
1	2W	Two-Wheeler
2	2WD	Two-wheel drive
3	3W	Three-Wheeler
4	4WD	Four-wheel drive
5	AI	Artificial Intelligence
6	AIS	Automotive Industry Standard
7	B	Billion
8	BS-VI	Bharat Stage VI
9	CAGR	Compound Annual Growth Rate
10	CAPEX	Capital Expenditure
11	CE	Construction Equipment
12	CHC	Customer Hiring Centers
13	CPI	Consumer Price Index
14	Cr	Crore
15	CVT	Continuously Variable Transmission
16	CY	Calendar Year
17	DFC	Dedicated Freight Corridor
18	DVA	Domestic Value Addition
19	E	Estimated
20	EV	Electric Vehicle
21	FAME-II	Faster Adoption and Manufacturing of Electric Vehicles – Phase II
22	FDI	Foreign Direct Investment
23	FY	Financial Year
24	GDP	Gross Domestic Product
25	GIS	Geographic Information System
26	GPS	Global Positioning System

27	GVA	Gross Value Added
28	GW	Gigawatt
29	HP	Horsepower
30	ICE	Internal Combustion Engine
31	IIJA	Infrastructure Investment and Jobs Act (U.S.)
32	IIP	Index of Industrial Production
33	IMF	International Monetary Fund
34	IoT	Internet of Things
35	ISO	International Organization for Standardization
36	ISTS	Interstate Transmission System
37	IT	Information Technology
38	JIT	Just-in-Time
39	K	Thousand
40	Km	Kilometre
41	KW	Kilowatt
42	KWh	Kilowatt-hour
43	L	Lakh
44	LiDAR	Light Detection and Ranging
45	M	Million
46	MoU	Memorandum of Understanding
47	MUV	Multi Utility Vehicle
48	NIP	National Infrastructure Pipeline
49	NVH	Noise, Vibration, and Harshness
50	NOx	Nitrogen Oxides
51	OEM	Original Equipment Manufacturer
52	P	Projected
53	PLI	Production Linked Incentive
54	PV	Present Value (or Photovoltaic, depending on context)
55	QMS	Quality Management System
56	RBI	Reserve Bank of India
57	ROW	Rest of World
58	RPM	Revolutions Per Minute

59	RVF	Rubber Vulcanising Factor
60	SCADA	Supervisory Control and Data Acquisition
61	SCM	Supply Chain Management
62	SMAM	Sub-Mission on Agricultural Mechanisation
63	SUV	Sport Utility Vehicle
64	T	Trillion
65	TREM	Tractor Emission Norm
66	TCO	Total Cost of Ownership
67	ZEV	Zero Emission Vehicle

EXCHANGE RATE TABLE

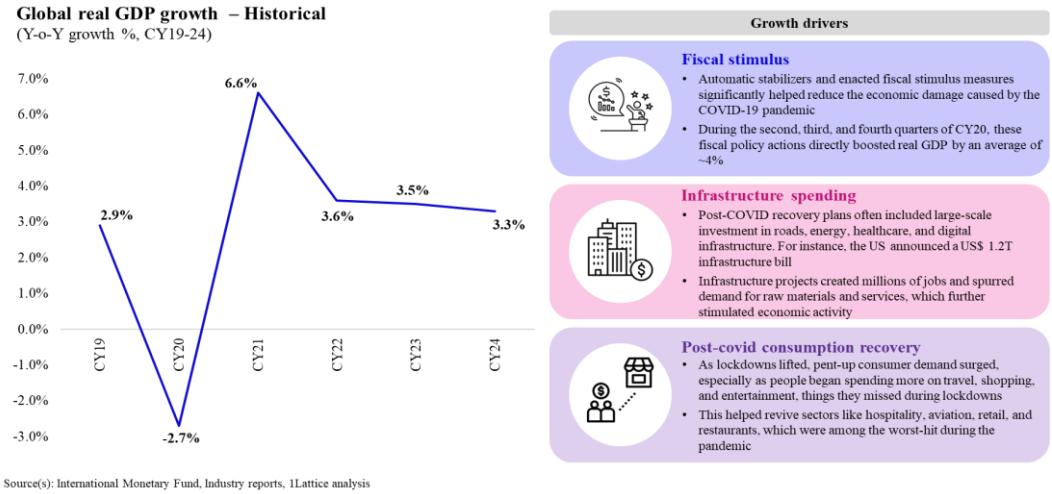
Year (FY)	Rs. Equivalent of one US$	Euro equivalent of one US$	Year (CY)	Rs. Equivalent of one US$	Euro equivalent of one US$
2015-16	66.33	0.88	2016	67.95	0.95
2016-17	64.84	0.93	2017	63.93	0.83
2017-18	65.04	0.81	2018	68.36	0.88
2018-19	69.17	0.89	2019	69.89	0.89
2019-20	70.49	0.93	2020	74.18	0.83
2020-21	73.20	0.85	2021	74.50	0.83
2021-22	74.50	0.86	2022	76.10	0.91
2022-23	80.32	0.96	2023	82.31	0.93
2023-24	82.59	0.93	2024	83.67	0.92
2024-25	84.56	0.93	2025	86.60	0.95

Macroeconomic overview of the Global economy

Gross domestic product (GDP) and GDP growth, including forecasts, growth drivers & policies

Global GDP growth rebounded sharply to 6.6% in Calendar Year 2021 before moderating to 3.6% in Calendar Year 2022 & 3.3% in Calendar Year 2024

Following the COVID-19 pandemic, the global economy saw a quick rebound. This recovery was mainly due to large fiscal spending, the normalisation of supply chains, and a spike in consumer demand as restrictions eased and vaccination efforts increased. The restart of global trade and the removal of lockdowns helped reverse much of the GDP drop seen in Calendar Year 2020. After decreasing by about -2.7% in Calendar Year 2020, the world economy grew by 6.6% in Calendar Year 2021. This growth moderated to 3.6% in Calendar Year 2022 and dipped slightly to 3.3% in Calendar Year 2024. However, this recovery was uneven across regions, with advanced economies typically doing better than emerging markets. Global growth has slowed recently, marked by high interest rates, tighter financial conditions, and geopolitical tensions, including the Russia-Ukraine war, unrest in the Middle East, and US-China trade issues.



Source(s): International Monetary Fund, Industry reports, 1Lattice analysis

Policies supporting GDP growth post-COVID:

- **Pandemic relief programs:** The IMF provided financial assistance and debt service relief to member countries affected by the economic impact of the COVID-19 pandemic between March 2020 and March 2022. Similarly, emergency measures like the CARES Act in the US and comparable initiatives in other countries provided essential support to households and businesses, helping them navigate the severe economic disruptions.

- **Supply chain resilience plans:** The pandemic's severe disruptions affected industries across the globe, halting production, ruining logistics, and destabilising supply and demand, with 94% of companies reporting COVID-induced supply chain disruptions. Due to this, companies began adopting regionally diversified supply chains to reduce dependency on single geographies, enhance flexibility, and build resilience against future shocks.

- **Interest rate adjustments by central banks:** In response to the coronavirus outbreak, many central banks globally, including the U.S. Federal Reserve, reduced interest rates to support economic activity. Lower interest rates lowered the cost of borrowing, encouraging businesses and households to take loans and increase spending, thereby helping to boost economic growth.

Global GDP growth is set to remain stable at 2.8 to 3.2% from Calendar Year 2025 to 2029 amid structural shifts, digitisation, & green investments

Global real GDP growth is expected to stay moderate but positive compared to the rebound after the pandemic. It will likely range from 2.8% to 3.2% from Calendar Year 2025 to Calendar Year 2029. This outlook is supported by several growth drivers, especially in emerging markets.

- Industrial rebalancing is leading to a shift toward higher value-added manufacturing and more resilient supply

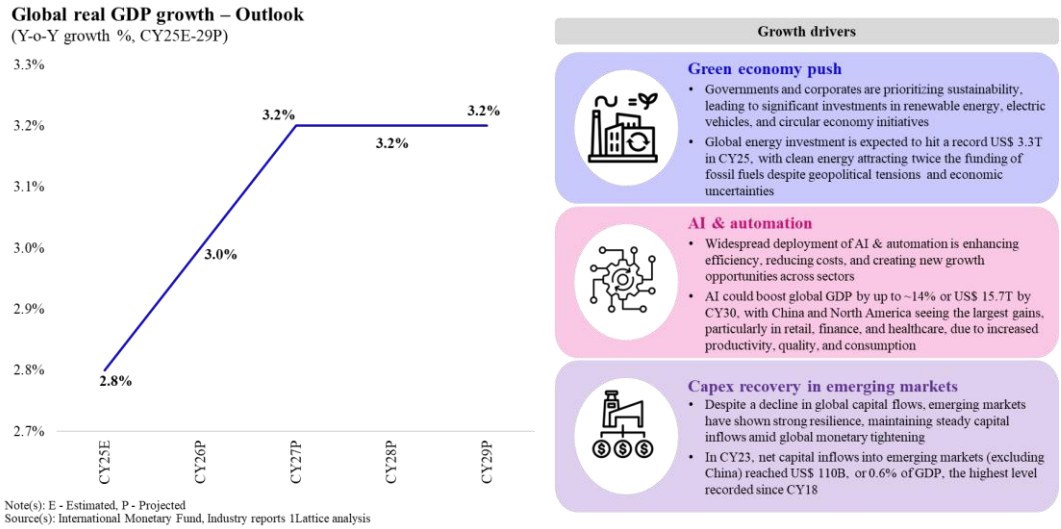
chains. Countries like Vietnam, Thailand, and India are attracting investments to create more diversified and resilient manufacturing hubs with improvements in infrastructure and labour reforms to move beyond low-cost assembly into higher value-added production like electronics and automotive components.

- Rapid digitisation is improving productivity and creating new economic opportunities. For instance, in Africa, platforms such as Jumia and Alibaba have allowed businesses to reach global consumers directly, avoiding conventional trade intermediaries and significantly broadening their market reach.

- Significant investments in renewable energy are helping the move toward greener economies and improving energy security. Solar PV (photovoltaics) is the single largest investment focus globally, with projected spending of about USD 450 billion in Calendar Year 2025, spanning both utility-scale and rooftop solar projects.

- Trade diversification, through new agreements and regional integration, is reducing dependence on traditional partners and creating new markets. For instance, African countries relied heavily on China for trade, causing supply chain disruptions during China's COVID-19 lockdowns; to reduce such risks, countries like South Korea have diversified their trade partners across multiple regions, helping them better withstand trade conflicts like the U.S.-China trade war.

Although risks like geopolitical tensions, inflation, and climate-related disruptions exist, the combination of these growth drivers positions emerging markets, such as India, Vietnam, and several African nations, to perform better than global averages. This ensures that overall GDP growth stays positive during this period.



Policies supporting GDP growth in future:

- **Clean energy subsidies**: Numerous countries are promoting renewable energy and supporting infrastructure through subsidies, tax breaks, and grants. In the shifting global energy landscape, hydrogen has emerged as a key element of the clean energy transition. The EU's Clean Industrial Deal, launched in Calendar Year 2025, aims to add 100 GW of renewable energy yearly until Calendar Year 2030, supported by subsidies from the Innovation Fund and a new Industrial Decarbonisation Bank to make clean energy more affordable for industries.

- **Trade diversification strategies**: Several countries have successfully diversified their economies by moving away from relying on a single export to a wider range. Chile expanded beyond copper and became a major exporter of fruits and wine. Rwanda rebuilt its economy after the genocide in Calendar Year 1994 by growing its coffee, tea, and tourism sectors. Meanwhile, Ethiopia decreased its dependence on coffee by developing its textile and garment industries, which created jobs and attracted foreign investment.

- **Digital infrastructure investments**: Investments in digital infrastructure, such as high-speed internet, data centres, and 5G networks, are enabling digital services, smart cities, and financial inclusion, especially in emerging economies. In Latin America, 98% of companies have initiated their digital transformation, with

80% currently in the process of implementing or optimising their strategies.

GDP growth of key advanced & emerging economies - historical & outlook

India led GDP growth, peaking at 9.7% in Calendar Year 2021 whereas China's GDP stabilised to 5% in Calendar Year 2024

From Calendar Year 2019 to Calendar Year 2024, a few advanced & emerging economies across the globe saw significant changes in real GDP growth. The COVID-19 pandemic in Calendar Year 2020 caused sharp economic drops across the board. India rebounded impressively after its steep drop in Calendar Year 2020 and achieved the highest growth rates among these countries, peaking in Calendar Year 2021. China's growth slowed but remained positive, stabilising around 5% by Calendar Year 2024. The USA recovered well after its Calendar Year 2020 contraction and maintained steady, moderate growth in the following years. In contrast, the UK and Germany faced persistent challenges, including supply bottlenecks and energy shocks, which dampened their recovery and led to relatively sluggish or even negative growth in some years, such as Germany's -0.2% in Calendar Year 2024. These trends show that emerging countries like Brazil, India, China, Indonesia, and Russia are leading global economic growth over a few advanced economies like Australia, Canada, USA, UK, and Germany.

Real GDP growth across key advanced economies – Historical
(Y-o-Y growth %, CY19-24)

Top economies	Australia	Canada	USA	UK	Germany
CY19	1.9%	1.9%	2.6%	1.6%	1.0%
CY20	-2.0%	-5.0%	-2.2%	-10.3%	-4.1%
CY21	5.4%	6.0%	6.1%	8.6%	3.7%
CY22	4.1%	4.2%	2.5%	4.8%	1.4%
CY23	2.1%	1.5%	2.9%	0.4%	-0.3%
CY24	1.0%	1.5%	2.8%	1.1%	-0.2%

Real GDP growth across key emerging economies – Historical
(Y-o-Y growth %, CY19-24)

Top economies	Brazil	China	India	Indonesia	Russia
CY19	1.2%	6.1%	3.9%	5.0%	2.2%
CY20	-3.3%	2.3%	-5.8%	-2.1%	-2.7%
CY21	4.8%	8.6%	9.7%	3.7%	5.9%
CY22	3.0%	3.1%	7.6%	5.3%	-1.4%
CY23	3.2%	5.4%	9.2%	5.0%	4.1%
CY24	3.4%	5.0%	6.5%	5.0%	4.1%

Source(s): International Monetary Fund, 1Lattice analysis

India is set to lead global GDP growth with over 6% annually, while China is expected to slow down to 3.7 to 4%

Between Calendar Year 2025 and Calendar Year 2029, India is expected to record the highest and most stable real GDP growth among emerging global economies, consistently exceeding 6% annually. In comparison, China's growth, though stronger than that of developed nations, is projected to slow gradually from 4% to around 3.7%. Developed economies like Australia, Canada, the USA, the UK, and Germany are likely to see modest growth. This underscores a broader shift in the global economic landscape, where emerging markets like Brazil, India, China, Indonesia, and Russia are becoming central to global growth. Driven by strong domestic demand, young populations, and supply chain diversification, these regions are attracting increased attention from global manufacturers and investors aiming to tap into their rising consumer potential.

Real GDP growth across key advanced economies – Outlook
(Y-o-Y growth %, CY25E-29P)

Top economies	Australia	Canada	USA	UK	Germany
CY25E	1.6%	1.4%	1.8%	1.1%	0.0%
CY26P	2.1%	1.6%	1.7%	1.4%	0.9%
CY27P	2.3%	1.7%	2.0%	1.5%	1.5%
CY28P	2.3%	1.6%	2.1%	1.5%	1.2%
CY29P	2.3%	1.6%	2.1%	1.4%	1.0%

Real GDP growth across key emerging economies – Outlook
(Y-o-Y growth %, CY25E-29P)

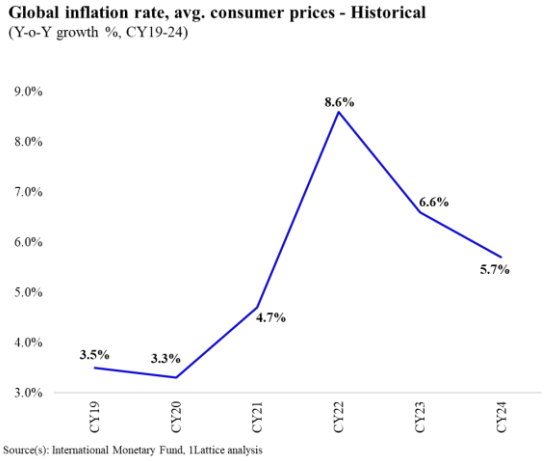
Top economies	Brazil	China	India	Indonesia	Russia
CY25E	2.0%	4.0%	6.2%	4.7%	1.5%
CY26P	2.0%	4.0%	6.3%	4.7%	0.9%
CY27P	2.2%	4.2%	6.5%	4.9%	1.1%
CY28P	2.3%	4.1%	6.5%	5.0%	1.1%
CY29P	2.4%	3.7%	6.5%	5.1%	1.2%

Note(s): E - Estimated, P - Projected
Source(s): International Monetary Fund, 1Lattice analysis

Global inflation & forecasts

Global inflation peaked at 8.6% in Calendar Year 2022 due to supply shocks and energy costs, easing to 5.7% in Calendar Year 2024 & remaining well above pre-pandemic levels

Between Calendar Year 2019 & Calendar Year 2024, global inflation was relatively stable until the COVID-19 pandemic hit. Initially, the pandemic triggered a sharp decline in demand and oil prices. However, as economies reopened post Calendar Year 2020, demand rebounded faster than supply, leading to significant supply chain disruptions and rising prices. Inflation pressures intensified after Calendar Year 2021, driven by rising energy and commodity costs. Geopolitical tensions, especially the Russia-Ukraine war, worsened the situation by disrupting global food and fuel supplies. By Calendar Year 2022, global inflation peaked at 8.6%, up from 4.7% in Calendar Year 2021. The world faced demand-pull inflation due to increased government spending and monetary policies, along with cost-push inflation from supply shocks and high input costs. Although inflationary pressures started to ease in the middle of Calendar Year 2022, inflation rates stayed high compared to pre-pandemic levels, averaging 6.6% in Calendar Year 2023 and 5.7% in Calendar Year 2024.



Global inflation is expected to stabilise around 3.2 to 3.3% by improving cost visibility & stimulating long-term investment in capital goods & manufacturing

Between Calendar Year 2025 and Calendar Year 2029, inflation across major economies is expected to return to more typical, stable levels after a period of heightened volatility. Starting from an estimated 4.3% in Calendar Year 2025, inflation is expected to decline to 3.6% in Calendar Year 2026 and then remain relatively steady at around 3.2 to 3.3% through Calendar Year 2029. This normalisation means that price increases will become more predictable and moderate, allowing businesses to anticipate better and manage their costs. Companies will have improved visibility over their future expenses, which reduces uncertainty and risk when planning large-scale, long-term investments. This environment of stable inflation can be particularly beneficial for sectors like capital goods and manufacturing, where projects often require substantial upfront spending and yield returns over many years. With inflation stabilising and interest rates also moving toward their long-term equilibrium, businesses are more likely to invest in new equipment, expand production capacity, and undertake other capital-intensive projects, supporting broader economic growth & modernisation.

Inflation - World, advanced economies, emerging economies

Global inflation remains a critical macroeconomic lever influencing interest rates, investment decisions &

industrial cost structures worldwide

Global inflation remains a critical macroeconomic force, influencing monetary policy, investment planning, and industrial cost structures worldwide. In Calendar Year 2025, inflation is expected to ease to 4.3%, down from 5.7% in Calendar Year 2024. This moderation is primarily driven by softening global demand, the delayed effects of earlier monetary tightening by central banks, and broadly stable commodity prices. However, inflation remains above pre-pandemic levels in many countries, and the improvements are likely to vary by region. In economies imposing new tariffs, inflationary pressures could rise again because of supply shocks. Meanwhile, lower demand in those markets may lead to reduced inflation. Developed markets are gradually seeing inflation trend toward central bank targets, but differences between regions are becoming more obvious. These differences are driven by varying trade policies, fiscal responses, and currency trends.

Inflation in advanced economies is moderating, while emerging markets show mixed trends with lingering vulnerabilities & regional divergences

- **Inflation trend across advanced economies:** Inflation across advanced economies is moderating after peaking in Calendar Year 2022, creating room for monetary policy stabilisation and a gradual recovery in business sentiment. From a high of 8.6% in Calendar Year 2022, global inflation is expected to fall to 4.3% by Calendar Year 2025E. Economies such as Germany and the UK, which were impacted during the inflation spike, have experienced a significant cooling of prices due to tighter monetary policies and decreasing energy costs. However, inflation in Calendar Year 2025E remains above the pre-pandemic range, indicating that price stability is still a work in progress. Variability in policy responses, wage dynamics & exchange rates continue to create divergence in inflation paths across regions, even as the broader disinflation trend strengthens.

- **Inflation trends across emerging economies**: Inflation across emerging economies from Calendar Year 2019 to 2025 highlight the lingering effects of COVID-19 & ongoing vulnerability to global price shocks. The pandemic triggered a sharp inflationary surge across most markets, with Brazil rising from approximately 3.2% to approximately 9.3% from Calendar Year 2020 to 2022 and Russia spiking from 3.4% to 13.7% in the same period. India saw an increase from 6.2% in Calendar Year 2020 to 6.7% in Calendar Year 2022, while Indonesia's inflation remained relatively contained, ranging between 2.0 to 4.1%. These spikes reflect the inflationary pass-through of supply chain disruptions, currency depreciation & rising global commodity prices. China remained an outlier with inflation staying below 2.5% throughout the period and is further expected to drop to 0.0% in Calendar Year 2025. In Calendar Year 2025, inflation is expected to remain elevated in Russia (approximately 9.3%) and Brazil (approximately 5.3%), while India (approximately 4.2%) and Indonesia (approximately 1.7%) reflect greater stability.

Inflation rate, avg. consumer prices
(Y-o-Y growth %, CY19-25E)

Year	World	Advanced economies					Emerging economies				
		Australia	Canada	Germany	UK	US	Brazil	China	India	Indonesia	Russia
CY19	3.5%	1.6%	1.9%	1.4%	1.8%	1.8%	3.7%	2.9%	4.8%	2.8%	4.5%
CY20	3.3%	0.9%	0.7%	0.4%	0.9%	1.3%	3.2%	2.5%	6.2%	2.0%	3.4%
CY21	4.7%	2.8%	3.4%	3.2%	2.6%	4.7%	8.3%	0.9%	5.5%	1.6%	6.7%
CY22	8.6%	6.6%	6.8%	8.7%	9.1%	8.0%	9.3%	2.0%	6.7%	4.1%	13.7%
CY23	6.6%	5.6%	3.9%	6.0%	7.3%	4.1%	4.6%	0.2%	5.4%	3.7%	5.9%
CY24	5.7%	3.2%	2.4%	2.5%	2.5%	3.0%	4.4%	0.2%	4.7%	2.3%	8.4%
CY25E	4.3%	2.5%	2.0%	2.1%	3.1%	3.0%	5.3%	0.0%	4.2%	1.7%	9.3%

Source(s): International Monetary Fund, 1Lattice analysis

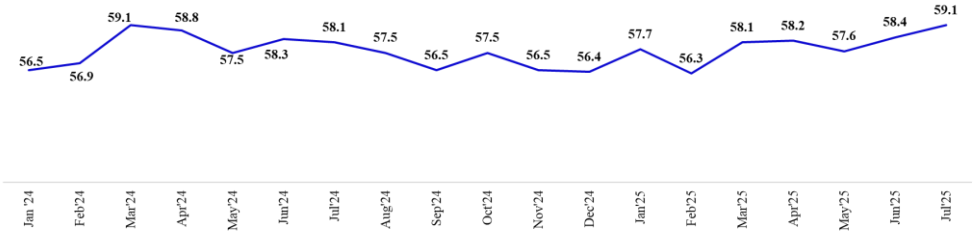
Macroeconomic overview of the Indian economy

India's manufacturing PMI stayed above 50 throughout Calendar Year 2024 to 2025*, peaking at approximately 59.1 in Mar'24 & Jul'25

India's Manufacturing PMI (an indicator reflecting health of manufacturing sector, derived from monthly surveys of purchasing managers; reading >50 signifies expansion, while reading <50 indicates contraction) has consistently stayed in the expansion zone from January of Calendar Year 2024 to July of Calendar Year 2025,

reflecting sustained industrial growth. The index peaked at 59.1 in both Mar'24 & Jul'25, indicating strong manufacturing momentum. Even in periods of moderation, PMI held above 56, supported by steady new orders, production strength & business confidence, signalling resilience in India's manufacturing ecosystem.

Manufacturing PMI - India
(M-o-M, CY24-25)

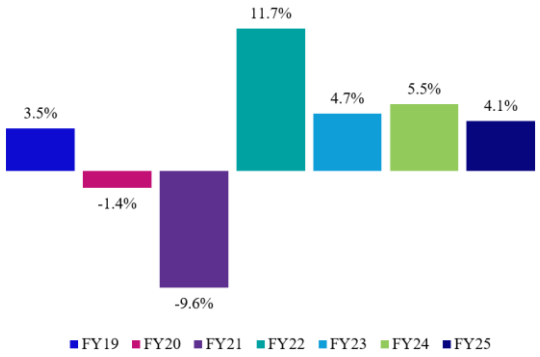


Note(s): *Data for CY25 is available till July 2025, based on latest month-on-month figures
Source(s): Ministry of Statistics and Programme Implementation (MoSPI), 1Lattice analysis

Manufacturing IIP growth rebounded post-COVID, now stabilising at approximately 4 to 5%

The index of industrial production (IIP) is an economic indicator that measures the change in the volume of production across manufacturing, mining & electricity sectors in the economy. India's manufacturing IIP grew by approximately 3.5% in Fiscal 2019, before contracting to -1.4% in Fiscal 2020 & -9.6% in Fiscal 2021 amid COVID-related disruptions. A sharp rebound followed in Fiscal 2022 with approximately 11.7% growth, led by reopening demand. Since then, IIP growth has stabilised, at approximately 4.7% in Fiscal 2023, approximately 5.5% in Fiscal 2024 & approximately 4.1% in Fiscal 2025, reflecting a return to pre-pandemic trends driven by steady industrial demand, infrastructure push & improved capacity utilisation.

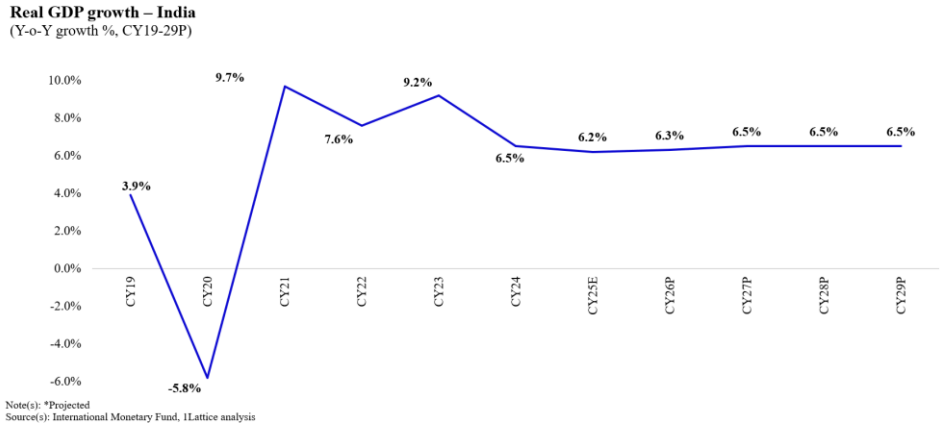
India's IIP growth - Manufacturing
(Y-o-Y growth %, FY19-25)



Source(s): Ministry of Statistics and Programme Implementation (MoSPI), 1Lattice analysis

India's real GDP growth recovered post-COVID & is projected to stabilise at 6.2 to 6.5% through Calendar Year 2029

India's real GDP growth showed a 3.9% increase in Calendar Year 2019 compared to real GDP in Calendar Year 2018, before dipping to -5.8% in Calendar Year 2020 due to the pandemic. Strong recovery followed, with growth rate reaching approximately 9.7% in Calendar Year 2021 before stabilising at approximately 6.5% in Calendar Year 2024, supported by policy stimulus & domestic resilience. Beyond cyclical recovery, structural factors such as rising urbanisation, a growing middle class & increasing integration into global value chains are expected to sustain momentum. Real GDP growth from Calendar Year 2025 to 2029 is projected to remain stable around approximately 6.2 to 6.5%, backed by digitalisation, capex-led expansion, policy continuity & supply chain localisation, reflecting India's position as one of the fastest-growing major economies globally.



The following growth drivers have contributed to India's economic recovery & are expected to continue fuelling GDP expansion in the coming years:

- **Make in India:** Launched by the government of India with a budget outlay of approximately USD 26 billion as a flagship initiative to position India as a global manufacturing hub by driving industrial investment, innovation & infrastructure development

- **Aatmanirbhar Bharat:** Launched during the pandemic with a mission to integrate Indian goods into global supply chains & promote self-reliance, backed by approximately USD 269 billion budget to boost domestic production

- **Gati Shakti:** Launched in Fiscal 2022 as a "National Master Plan" to reduce logistics costs & execution delays by enabling time-bound development of approximately 434 major economic corridors valued at approximately USD 139.8 billion, ensuring multi-modal connectivity

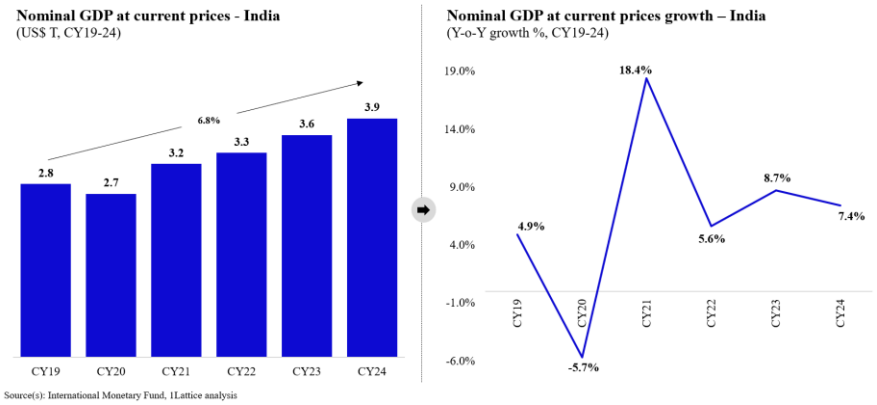
- **PLI schemes:** Government of India implemented PLI schemes with a budget outlay of approximately USD 24 billion, as a scheme to incentivise performance-linked manufacturing across 14 strategic sectors to boost domestic production, attract investment & strengthen India's global competitiveness

- **Reforms in infrastructure, taxation & Ease of Doing Business (EODB):** Through simplification of tax regimes, digitisation of compliance & fast-tracking of project approvals, the government has improved ease of doing business to create a more conducive environment for investment & growth

Collectively, these efforts have played a pivotal role in strengthening India's economic fundamentals & supporting the recovery & growth of GDP.

India's nominal GDP grew from approximately USD 2.8 trillion in Calendar Year 2019 to approximately USD 3.9 trillion in Calendar Year 2024, showing peak growth rate at approximately 18.4% in Calendar Year 2022

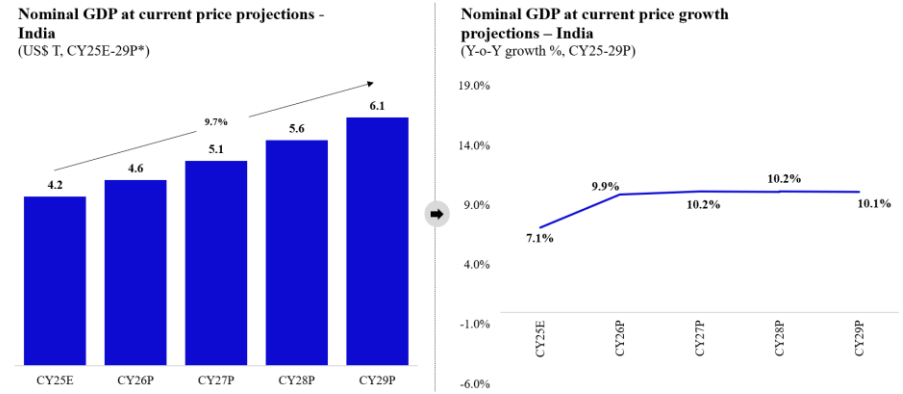
India's nominal GDP stood at approximately USD 2.8 trillion in Calendar Year 2019 before dipping to approximately USD 2.7 trillion in Calendar Year 2020, reflecting the pandemic impact. The growth rate peaked at 18.4% in Calendar Year 2021, indicating a strong post-COVID recovery before moderating to approximately 7.4% in Calendar Year 2024, as GDP reached USD 3.9 trillion. In the past five years, India's GDP growth has been driven by strong domestic consumption, higher government spending on infrastructure, rapid digitalisation, and the resilience of services and manufacturing sectors. Supportive policy reforms and a young, expanding workforce have further bolstered growth.



Source(s): International Monetary Fund, 1Lattice analysis

Nominal GDP is further projected to grow from approximately USD 4.2 trillion in Calendar Year 2025 to approximately USD 6.1 trillion in Calendar Year 2029

The nominal GDP is further projected to grow from approximately USD 4.2 trillion in Calendar Year 2025 to approximately USD 6.1 trillion in Calendar Year 2029. Growth is expected to remain strong, stabilising around 10% annually from Calendar Year 2026 to 2029. Structural drivers such as rapid digitalisation, expansion of the services sector, formalisation of the economy, and a growing manufacturing base under the "Make in India" initiative have further supported economic momentum. In addition, demographic advantages with a young workforce, rising urbanisation, and ongoing policy reforms have created a strong foundation for sustained growth.

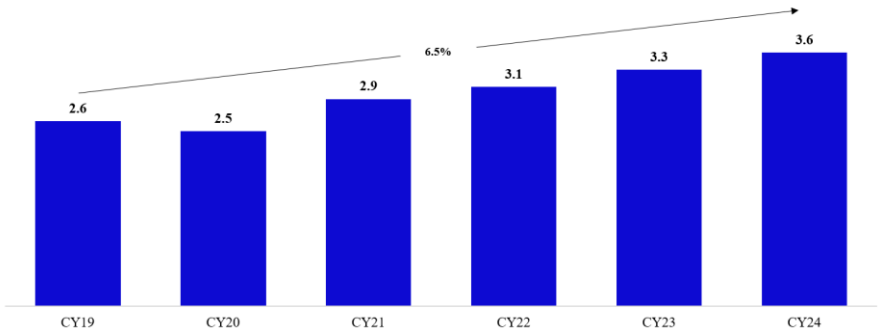


Note(s): *Projected
Source(s): International Monetary Fund, 1Lattice analysis

India's GVA grew from approximately USD 2.6 trillion in Calendar Year 2019 to approximately USD 3.6 trillion in Calendar Year 2024, registering a CAGR of approximately 6.5% during the period

GVA is an economic metric that measures the value of goods & services produced in an economy over a specific period, excluding the cost of intermediate inputs. India's GVA grew from approximately USD 2.6 trillion in Calendar Year 2019 to approximately USD 3.6 trillion in Calendar Year 2024, registering a CAGR of approximately 6.5% during the period. India's GVA growth over the past five years has been supported by robust services sector expansion, led by trade, financial, and IT services, along with a revival in industrial output. Rising infrastructure investment, policy-driven manufacturing push, and resilient agricultural performance have further contributed to the steady increase.

GVA at current prices - India
(US$ T, CY19-24)



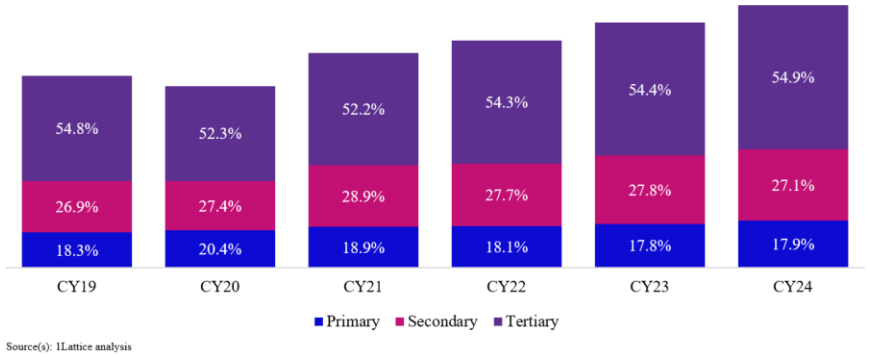
Source(s): International Monetary Fund, 1Lattice analysis

Secondary & tertiary sectors drove GVA growth post-COVID, with key sub-sectors like manufacturing & construction showing leading growth

The industrial & services sectors have been at the forefront of India's GVA recovery post-COVID, reflecting strong structural resilience & sustained economic momentum. The secondary sector's share, which rose from approximately 27.4% in Calendar Year 2020 to 28.9% in Calendar Year 2021 & has since stabilised to 27.1% by Calendar Year 2024, indicating revival in manufacturing & construction activity. The tertiary sector, which faced pandemic-led disruptions, recovered steadily from approximately 52.3% in Calendar Year 2020 to 54.9% in Calendar Year 2024, reaffirming the dominance of services in the economic mix.

Looking forward, India is poised to become a global manufacturing hub, driven by the China-plus-one strategy, the Ukraine-Russia crisis, high production costs in Europe, and India's position as the lowest-cost producer after China. European OEMs present significant growth opportunities as they accelerate their shift from internal-combustion to electric powertrains, creating demand for cost-competitive precision transmission and driveline components that Indian suppliers are well positioned to meet. The country's robust manufacturing ecosystem, ready availability of skilled labour & key raw materials, and strong government incentive schemes under 'Make in India' further reinforce India's emergence as a global manufacturing hub.

India GVA at current price segmentation - By sectors
(%, CY19-24)



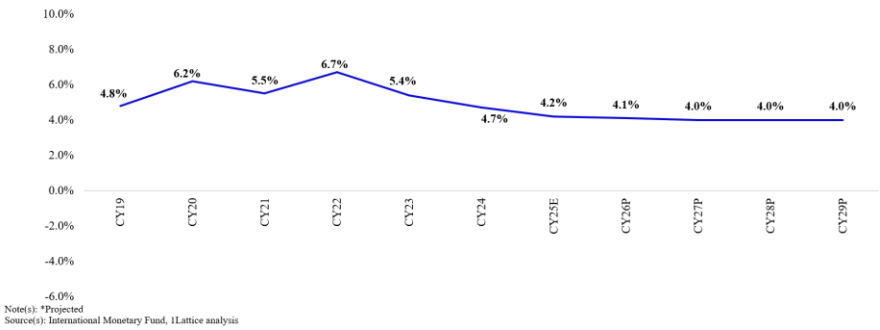
Source(s): 1Lattice analysis

Within these sectors, manufacturing, construction & financial sectors, real estate & professional services category has been the key contributor to growth.

CPI inflation grew from 4.8% in Calendar Year 2019 to peak at 6.7% in Calendar Year 2022, before easing to 4.7% in Calendar Year 2024

CPI inflation stood at 4.8% in Calendar Year 2019 & rose to a peak of 6.7% in Calendar Year 2022, driven by pandemic-led supply disruptions, food price volatility & global cost pressures. It has since moderated, reaching 4.7% in Calendar Year 2024, supported by policy continuity, supply-side reforms & improved food availability.

CPI index movement – India
(Y-o-Y growth %, CY19-29P)



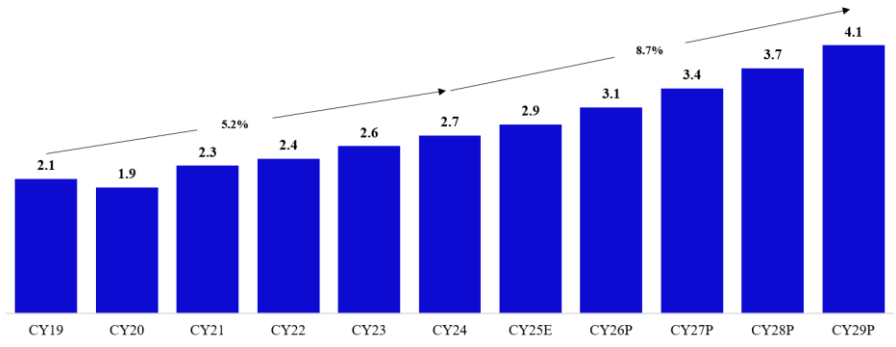
Note(s): *Projected
Source(s): International Monetary Fund, 1Lattice analysis

Looking ahead, CPI inflation is expected to remain broadly stable between 4.0 to 4.2% between Calendar Year 2025 & Calendar Year 2029P, reflecting a more controlled price environment. This sustained moderation is likely to be supported by continued government efforts, including targeted fiscal interventions, supply-side reforms & calibrated monetary policy. Measures such as rationalisation of import duties, buffer stock maintenance for key food commodities & timely interventions in fuel & food markets have been playing a key role in anchoring inflation within the RBI's tolerance band.

India's per capita income & is projected to reach approximately USD 4.1 thousand by Calendar Year 2029 from approximately USD 2.7 thousand in Calendar Year 2024

India's per capita income increased from approximately USD 2.1 thousand in Calendar Year 2019 to approximately USD 2.7 thousand in Calendar Year 2024, reflecting a CAGR of approximately 5.2% during the period. This growth has been underpinned by favourable demographics, urbanisation-led job creation & structural reforms like "Digital India", which have enhanced productivity & investment. Income levels are projected to reach approximately USD 4.1 thousand by Calendar Year 2029, supported by a stronger CAGR of approximately 8.7% during Calendar Year 2024 to 2029.

GDP per capita - India
(US$ K, CY19-29P*)



Note(s): *Projected
Source(s): International Monetary Fund, 1Lattice analysis

This sustained income growth is driven by a broad-based urban recovery, rising digital adoption across sectors & continued expansion of high-value services such as IT, financial services & real estate. These structural shifts are enhancing productivity, improving formal employment & boosting disposable incomes across segments.

Off-highway vehicle market – Overview & outlook

The off-highway vehicle industry encompasses agricultural machinery such as tractors & harvesters, and construction equipment including bulldozers, cranes, and material handlers. These machines are specifically designed for non-road applications primarily across two key segments: Agriculture & construction.

- Agricultural equipment primarily comprises tractors & harvesters, which are essential for core farming operations such as land preparation, sowing, harvesting & post-harvest handling. In Calendar Year 2024, tractors contributed approximately 2.6 million units to the global off highway vehicle market, while harvesters contributed approximately 0.1 million units. Tractor sales alone accounted for approximately

68.4% of the global off-highway vehicle market, making it a key segment.

- Construction equipment refers to heavy machinery used for applications such as excavation, lifting, paving, earthmoving, etc. It contributed approximately 1.2 million units to the global off-highway vehicle market in Calendar Year 2024. Construction equipment includes earthmoving (excavators, backhoe loaders), material handling (cranes, forklifts), and road machinery (compactors, pavers), covering major construction, industrial, and logistics needs .

These machines are purpose-built to operate in rugged & off-road environments, with specifications customised for heavy-duty & high-performance tasks. The demand for off-highway vehicles is typically influenced by seasonal agricultural cycles in the farm sector & the pace of construction activity.

Government initiatives and technological advancements driving transformation of off-highway vehicle industry

The off-highway vehicle industry is undergoing rapid transformation driven by advancements in automation, electrification & digital technologies. Modern machines are becoming more efficient, intelligent & sustainable through innovations such as precision GPS, telematics & hybrid or electric powertrains. The Indian government is taking vital steps to actively support this transformation through targeted policies & public investments such as:

- **Bharat Stage (TREM) emission standards:** The government has mandated progressively stringent emission norms to reduce environmental impact.
    - The TREM IV standards, effective from January 2023 for tractors (>50 HP), require a significant reduction in pollutants, limiting Particulate Matter (PM) to 0.025 g/kWh and Nitrogen Oxides (NOx) to 0.4 g/kWh for engines between 56 to 560kW.
    - The upcoming TREM V norms, scheduled for 2026, will tighten these limits further to 0.015 g/kWh for PM and introduce a Particle Number (PN) limit for the first time, aligning Indian regulations with global benchmarks like Euro Stage V.
- **Sub-Mission on Agricultural Mechanisation (SMAM)**: Launched under the Ministry of Agriculture to improve farm mechanisation levels by providing subsidies for equipment, particularly for small & marginal farmers.
    - Under this scheme, the farm power availability increased from approximately 1.84 kW/ha in Fiscal 2014 to approximately 2.59 kW/ha in Fiscal 2022, reflecting an approximately 35% increase in farm power & accelerated mechanisation across the nation.
- **PM Gati Shakti, National Infrastructure Pipeline (NIP) & Smart Cities Mission:** Aimed at boost demand for modern construction equipment by driving infrastructure development across the country.
    - These programs are collectively catalysing infrastructure development & integrated project development across India. For instance, under the Gati Shakti program, the Government of India has commissioned approximately 91 Gati Shakti cargo terminals along with key multimodal infrastructure initiatives such as Bharatmala.
    - Similarly, the Smart Cities Mission (SCM) has made significant progress, having completed approximately 7,555 out of approximately 8,067 projects, with an investment of approximately ₹ 1.5 trillion.
- **Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles (FAME) - II:** Implemented by the Government of India to accelerate adoption of electric & hybrid vehicles through demand incentives, subsidies & charging infrastructure support.
    - The scheme was allocated a budget outlay of approximately ₹ 110 billion in phase-III of adoption, reinforcing long-term government commitment to EV adoption.
    - Though focused on on-road mobility, the scheme is prompting OEMs to channel investments towards

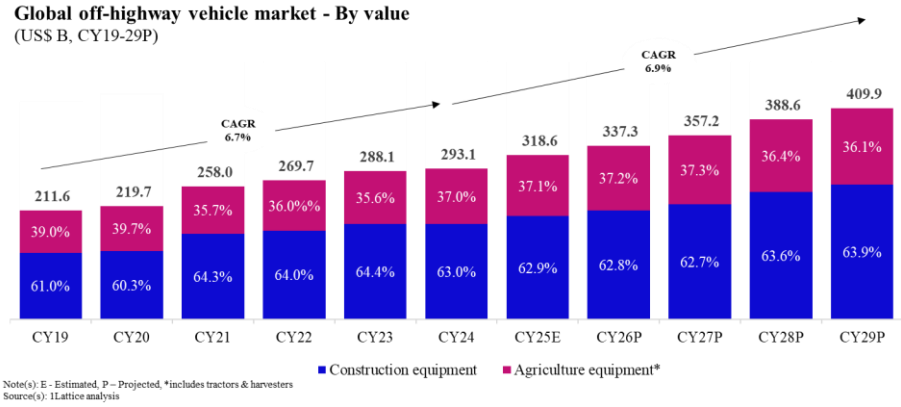
developing electric & hybrid technologies for off-highway vehicle applications as well.

These targeted policies, combined with rapid progress in automation, electrification & digitalisation, are reshaping the off-highway vehicle sector. OEMs are increasingly focusing on building smarter, cleaner & more efficient machines, while government support is ensuring that this transformation translates into large-scale adoption across agriculture, infrastructure & mobility applications.

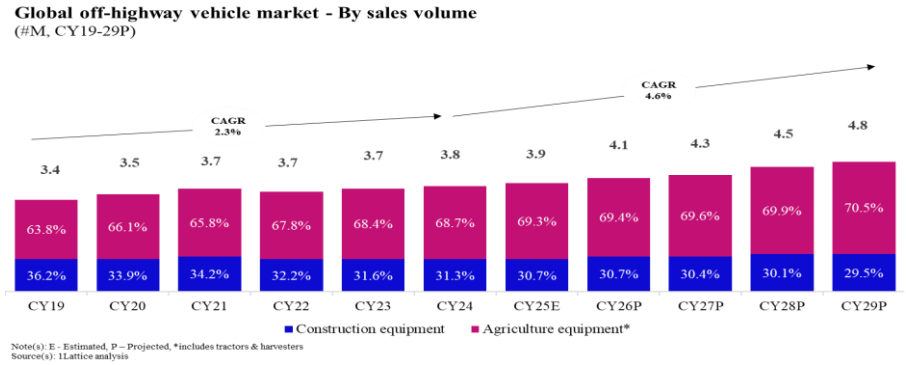
Global off-highway vehicle market grew from approximately USD 211.6 billion in Calendar Year 2019 to approximately USD 293.1 billion in Calendar Year 2024, reflecting a CAGR of approximately 6.7%

Global off-highway vehicle market grew from approximately USD 211.6 billion in Calendar Year 2019 to approximately USD 293.1 billion in Calendar Year 2024, reflecting a CAGR of approximately 6.7%. Growth during this period was supported by rising mechanisation in agriculture, infrastructure investments & adoption of advanced equipment across emerging markets. Agriculture equipment contribute to a considerable share in the market, consistently accounting for approximately 35 to 40% share across Calendar Year 2019 to 2029, driven by sustained demand for farm mechanisation in Asia-Pacific & other agrarian economies. The segment's centrality underscores agriculture's role as the primary growth engine for the industry, while construction & mining equipment contribute the balance.

Looking ahead, the market is projected to reach approximately USD 409.9 billion in Calendar Year 2029, growing at a CAGR of approximately 6.9% over Calendar Year 2024 to 2029, with tractors expected to retain their leadership alongside faster adoption of advanced construction machinery in emerging markets.



In terms of volume, the market grew from approximately 3.4 million units in Calendar Year 2019 to approximately 3.8 million units in Calendar Year 2024, reflecting a CAGR of 2.3%. The moderate growth reflected the pandemic-led disruptions & uneven recovery across regions. It is further projected to reach approximately 4.8 million units in Calendar Year 2029, registering a CAGR of 4.6% over Calendar Year 2024 to 2029, supported by rising demand for farm mechanisation, construction activity, & fleet upgrades in emerging markets.



Rising farm mechanisation, rapid urbanisation, adoption of smart equipment & green regulatory policies drives growth of the global off-highway vehicle market

The growth of the global off-highway vehicle industry is shaped by a confluence of factors such as rising farm

mechanisation & resilient agricultural practices, rapid urbanisation & infrastructure-led demand, increasing adoption of smart equipment through technological integration & a growing focus on sustainability driven by stringent green regulations.

Key growth drivers

Farm mechanisation & resilient agriculture

- **Labour shortages** & rising **efficiency needs** are driving farm mechanisation, with countries like **China** achieving mechanisation levels of ~**70%** in CY24
- Major economies like the **United States** are widely adopting **precision farming technologies** such as yield monitors, drones, robot milking & wearable livestock technologies, bolstering demand for **agricultural equipment**

Urbanisation & infra-led demand

- Massive **urban infrastructure** projects such as **smart city** initiatives, **metro** expansions, **highway upgrades**, & **multi-modal logistics parks** are accelerating global demand for off-highway vehicles
- Targeted government incentives & stimulus packages, like the **US** Infrastructure Investment and Jobs Act, **China's** Belt & Road Initiative, and **India's** Gati Shakti Master Plan, are significantly **boosting investments** in off-highway vehicles

Technology integration & smart equipment

- Rising demand for **precision & adaptability** is driving the adoption of smart technologies in off-highway equipment
- Such technological advancements like **AI[1]-driven algorithms**, **GIS[2] mapping** & **connected sensors** are boosting efficiency & reducing downtime
  - Tech-advancements like these are **fuelling demand** for advanced **off-highway vehicles** across sectors like **mining, construction & agriculture**

Sustainability & green regulations

- Stricter global emission norms, such as the **EU[3]'s stage V regulations**, mandating non-road engines between **19 kW[4] & 560 kW** to be equipped with **diesel particulate filters**, are accelerating the shift toward cleaner off-highway vehicles
- Key global players like **Caterpillar** are investing in **battery-electric** off-highway trucks & **green charging** solutions, aligning with global sustainability goals & boosting demand for **eco-friendly equipment**

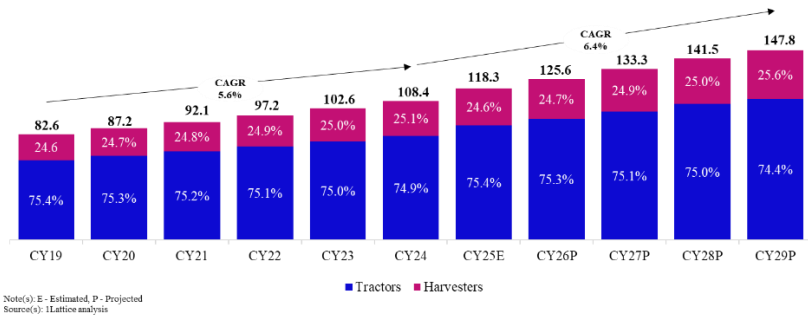
Note(s): [1]Artifical intelligence, [2]Geographic information system, [3]European Union, [4]Kilowatt

Global agricultural equipment market is projected to reach approximately USD 147.8 billion in Calendar Year 2029 from approximately USD 108.4 billion in Calendar Year 2024

The global agricultural equipment market grew from approximately USD 82.6 billion in Calendar Year 2019 to approximately USD 108.4 billion in Calendar Year 2024, reflecting a CAGR of approximately 5.6%. The growth was driven by increasing farm mechanisation, adoption of precision technologies & replacement of ageing machinery. Leading players such as Deere & Company, Case IH, AGCO Corporation & Kubota have been at the forefront of this expansion, driving innovation & market penetration across geographies. The market is further projected to reach approximately USD 147.8 billion in Calendar Year 2029, growing at a CAGR of approximately 6.4% over Calendar Year 2024 to 2029, supported by rising food demand, government subsidies & higher adoption of advanced equipment in emerging economies.

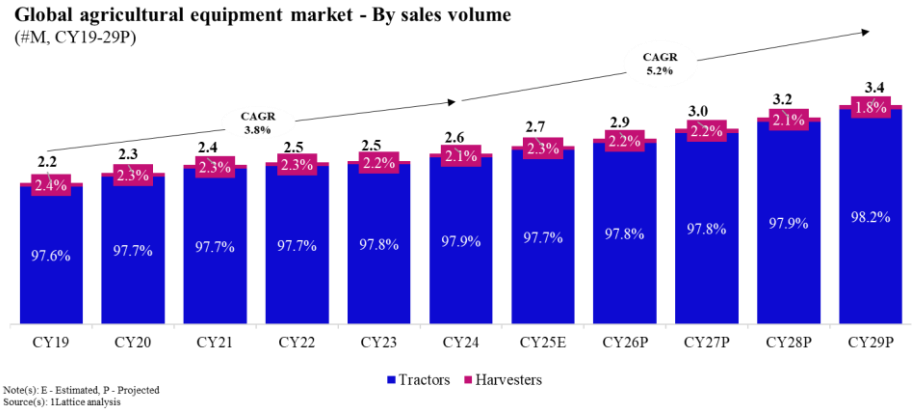
Reflecting its strong positioning in this global market, Milestone Gears is an approved supplier to John Deere, CNH, AGCO & Kubota, whose combined share represents approximately 54.4% of the global agri equipment market in value terms.

Global agricultural equipment market - By value
(US$ B, CY19-29P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

In terms of volume, the market grew from approximately 2.2 million units in Calendar Year 2019 to approximately 2.6 million units in Calendar Year 2024, reflecting a CAGR of 3.8%. Further, it is projected to grow to approximately 3.4 million units in Calendar Year 2029, reflecting a CAGR of approximately 5.2% over Calendar Year 2024 to 2029.

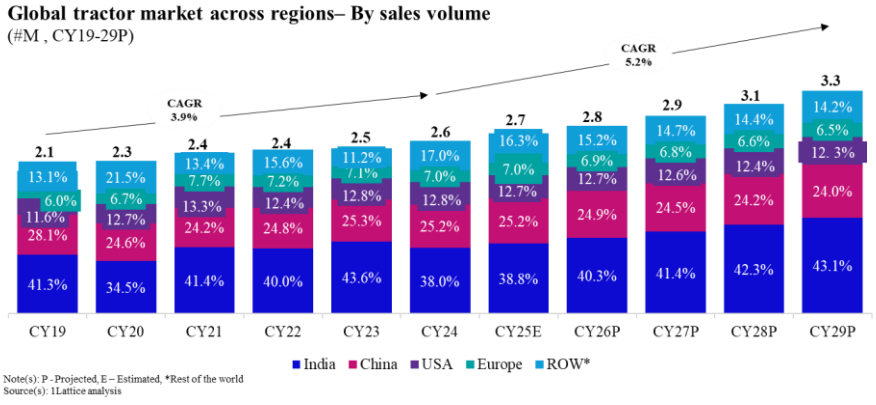


Global tractor market grew from approximately 2.1 million units in Calendar Year 2019 to approximately 2.6 million units in Calendar Year 2024, registering a CAGR of 3.9%

The global tractor market grew from approximately 2.1 million units in Calendar Year 2019 to approximately 2.6 million units in Calendar Year 2024, reflecting a CAGR of approximately 3.9% during the period. It is further projected to reach approximately 3.3 million units by Calendar Year 2029, reflecting a CAGR of approximately 5.2% over Calendar Year 2024 to 2029.

Region-wise, India remained the largest contributor, consistently accounting for approximately 38 to 43% of global volumes, supported by strong rural demand, favourable government policies & higher mechanisation levels. China contributes approximately 24 to 26% share, driven by large-scale farming practices, though growth is moderating as the market approaches maturity. The USA accounts for approximately 12 to 13% share, with demand led by replacement cycles & adoption of high-powered tractors. Europe contributes approximately 6 to 8%, largely stable due to mechanisation saturation, while the rest of the world (ROW), including Brazil & Bangladesh, is projected to rise to approximately 14% share by Calendar Year 2029, reflecting increasing adoption of tractors to improve agricultural productivity in emerging economies.

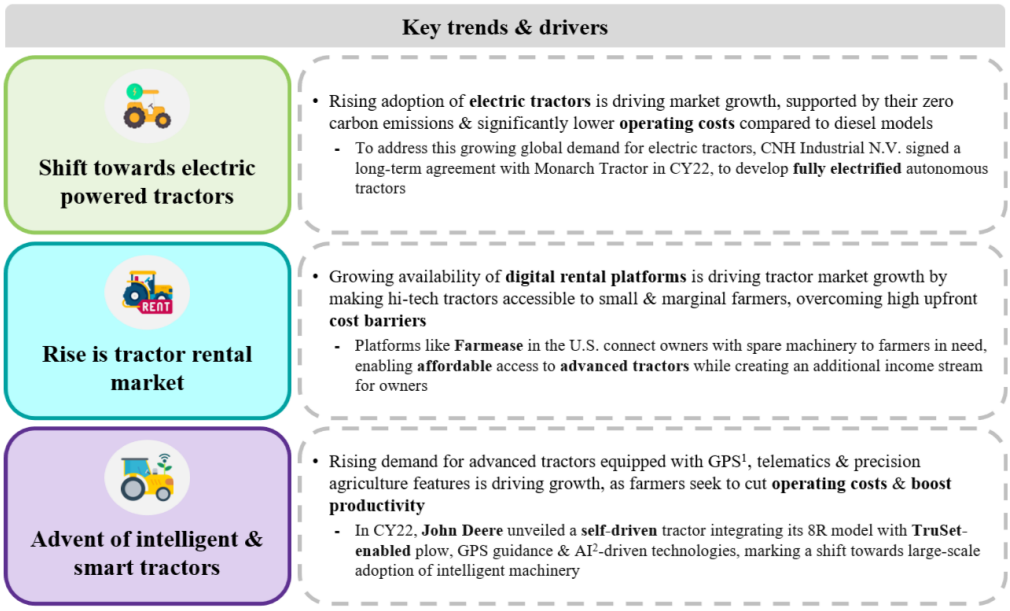
Overall, the industry's growth trajectory highlights the pivotal role of India & other markets in driving the next wave of expansion.



Growth drivers & trends of the global tractor market

The global tractor market is witnessing strong growth, driven by evolving trends and technological advancements. Key drivers include the shift towards electric-powered tractors for sustainable & cost-efficient operations, the advent of intelligent & smart tractors equipped with AI, GPS & precision farming capabilities, and the rise of digital tractor rental platforms that enhance accessibility for small & marginal farmers. Together, these factors are reshaping the industry landscape, improving productivity, reducing ownership costs & supporting wider adoption

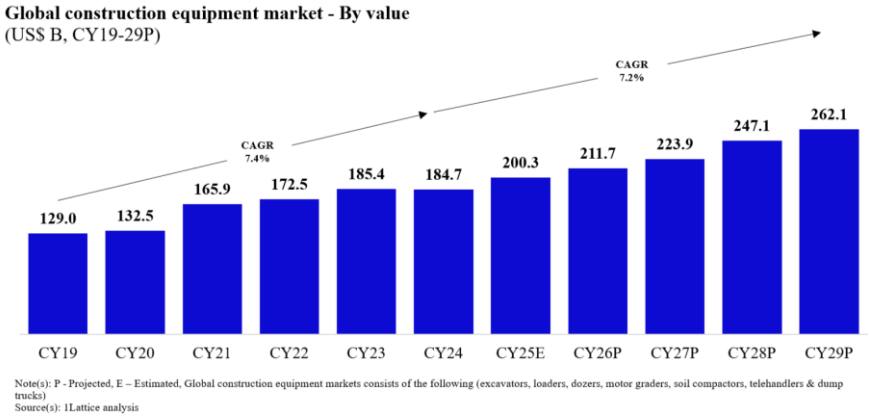
across global farming communities.



Note(s): [1]Global positioning system, [2]Artificial intelligence

Global construction equipment market grew from approximately USD 129 billion in Calendar Year 2019 to approximately USD 185 billion in Calendar Year 2024

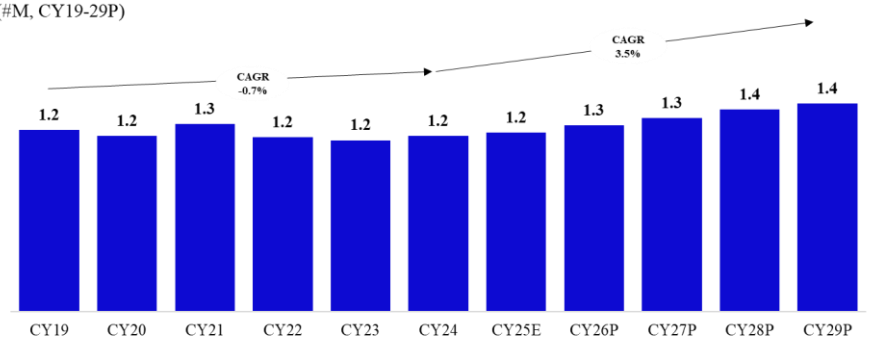
The global construction equipment market rose from approximately USD 129.0 billion in Calendar Year 2019 to approximately USD 184.7 billion in Calendar Year 2024, registering a CAGR of approximately 7.4% during the period. Growth was supported by premiumisation of equipment, greater integration of digital & automation technologies, and an overall increase in average selling prices, even as volumes remained largely stagnant. Further, the market is expected to rise to approximately USD 262.1 billion by Calendar Year 2029, driven by stabilisation in volumes alongside recovery in the construction & infrastructure sectors & continued shift towards advanced & high-value equipment.



Note(s): P - Projected, E – Estimated, Global construction equipment markets consists of the following (excavators, loaders, dozers, motor graders, soil compactors, telehandlers & dump trucks)
Source(s): 1Lattice analysis

In terms of volume, the market was valued at approximately 1.2 million units in Calendar Year 2019. Moving ahead, it stayed consistent at approximately 1.2 million units in Calendar Year 2024. The stagnation reflected pandemic-induced project delays, supply chain disruptions & reduced infrastructure spending in key markets like China, Europe & parts of Latin America due to economic slowdowns & real estate crises. Further, in Calendar Year 2029, it is projected to grow to approximately 1.4 million units, reflecting a CAGR of 3.5% from Calendar Year 2024 to 2029P, supported by recovery in construction activity & renewed infrastructure investment

Global construction equipment market - By sales volume
(#M, CY19-29P)



Note(s): P -Projected, E – Estimated, Global construction equipment markets consists of the following (excavators, loaders, dozers, motor graders, soil compactors, telehandlers & dump trucks)
Source(s): 1Lattice analysis

Growth in global construction is being driven by the growing need for construction equipment, surge in infrastructure investments, urban expansion, and regulatory mandates in the construction industry

The global construction equipment market is experiencing robust growth, driven by a confluence of structural & technological factors. Rapid urbanisation, rising equipment demand, greater adoption of automation & higher government spending on public infrastructure are collectively accelerating demand for modern construction machinery.

Key growth drivers

Growing need for construction equipment

- Accelerated urbanisation is fuelling **large-scale construction** activity to support housing, utilities & mobility needs in growing cities, boosting demand for **construction equipment** globally
  - With such a surge in urbanisation globally, ~**68%** of the world's population is projected to live in **urban areas** by CY50, up from ~**55%** in **CY25**
- **Infrastructure** needs such as mass transit, sewage systems & **vertical housing** in urban economies are fuelling the use of earthmoving & material handling equipment

Surge in infrastructure megaprojects

- Surge in global infrastructure **megaprojects** is boosting demand for high-capacity construction equipment, pushing OEMs[1] to scale up supply of machines with higher horsepower & advanced features
- Development of **smart cities** is on the rise, with global smart city market projected to reach ~**US$ 1.0T** by CY27 from ~US$ 511.6B in CY22, amplifying the need for **advanced construction machinery**

Adoption of smart construction equipment

- Advancements in automation & telematics are driving demand for **smart construction equipment** by improving efficiency & **reducing costs**
- Widespread adoption of advanced technologies like robotics & real-time telematics to improve **precision** & site productivity is prompting **large-scale production** of advanced equipment
  - For e.g., global player **Hitachi Construction Machinery** launched "**ConSite Mine**" with AI-based predictive maintenance systems helping operators reduce equipment downtime & cut operating costs

Increased government spending in infrastructure

- Increased government funding for infrastructure is accelerating **global demand** for construction equipment across sectors like **transportation, energy & public utilities**
- Large-scale **national programs** are unlocking substantial capital for infrastructure development, fueling demand for construction equipment
  - For e.g., the U.S. Infrastructure Investment and Jobs Act (IIJA) allocated ~**US$1.2T**, with ~**US$ 550B** in new investments across transport & public infrastructure

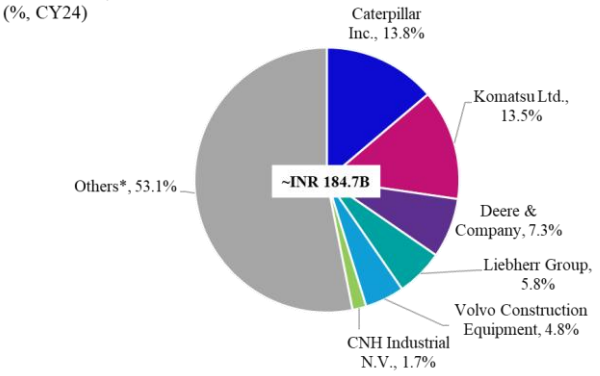
Note(s): [1]Original equipment manufacturer

Key players hold approximately 46.9% collective share of the global construction equipment market

Key players in the global construction equipment market include U.S. -based giants like Caterpillar (13.8%), Deere & Company (7.3%) & CNH Industrial (1.7%), Europe-based Liebherr (5.8%) & Volvo Construction Equipment (4.8%), and Japan-based Komatsu Ltd. (13.5%). Together, these players account for approximately

46.9% of the global market. These top manufacturers along with XCMG, Sany group, HD Hyundai Infracore, Terex Corporation, Epiroc, etc., significantly shape industry dynamics. Their market leadership is supported by diversified product portfolios, strong brand equity & extensive distribution networks worldwide.

Key players in the global construction equipment market - By value
(%, CY24)

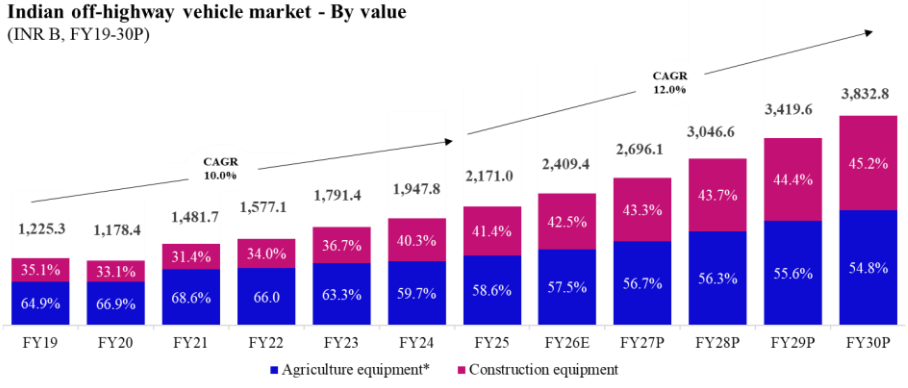


Note(s): *includes XCMG, Sany group, HD Hyundai Infracore, Terex Corporation, Epiroc, etc.
Source(s): Company websites, 1Lattice analysis

India off-highway vehicle market grew from approximately ₹ 1,225.3 billion in Fiscal 2019 to approximately ₹ 2,171.0billion in Fiscal 2025

India's off-highway vehicle market stood at approximately ₹ 1,225.3 billion in Fiscal 2019 and reached approximately ₹ 2,171.0 billion in Fiscal 2025, reflecting a strong CAGR of approximately 10.0%. It is further projected to expand to approximately ₹ 3,832.8 billion in Fiscal 2030, growing at a CAGR of approximately 12.0% over Fiscal 2025 to 2030. Market growth is underpinned by rising farm mechanisation levels & government-led infrastructure initiatives.

Indian off-highway vehicle market - By value
(INR B, FY19-30P)

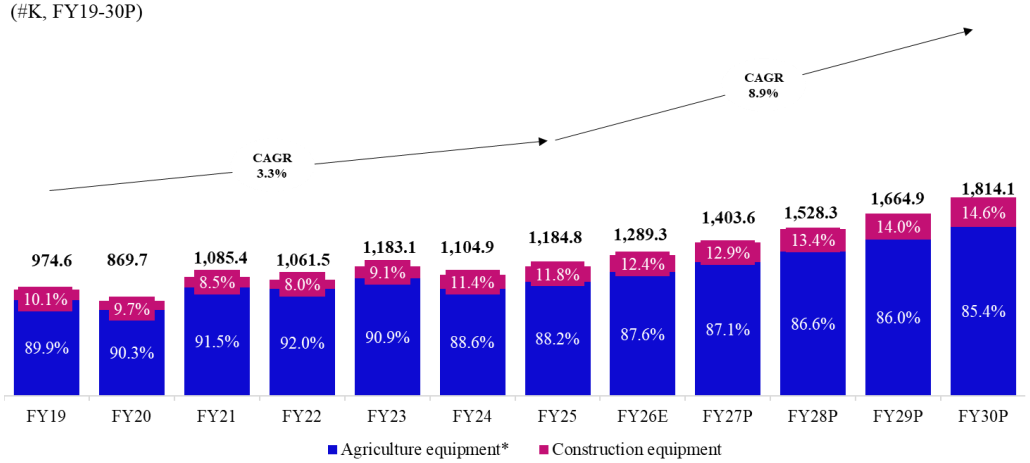


Note(s): E - Estimated, P – Projected, *includes tractors & harvesters
Source(s): 1Lattice analysis

In terms of volume, the market expanded from approximately 974.6 thousand units in Fiscal 2019 to approximately 1,184.8 thousand units in Fiscal 2025, reflecting a CAGR of approximately 3.3%. Growth was driven by wider adoption of tractors in agriculture, gradual uptake of construction machinery & improved activity in the mining sector.

By Fiscal 2030, volumes are expected to reach approximately 1,814.1 thousand units in Fiscal 2030, growing at a CAGR of approximately 8.9% over Fiscal 2025 to 2030, aided by large-scale infrastructure rollout, rising farm productivity needs & faster replacement of ageing fleets.

Indian off-highway vehicle market - By sales volume
(#K, FY19-30P)

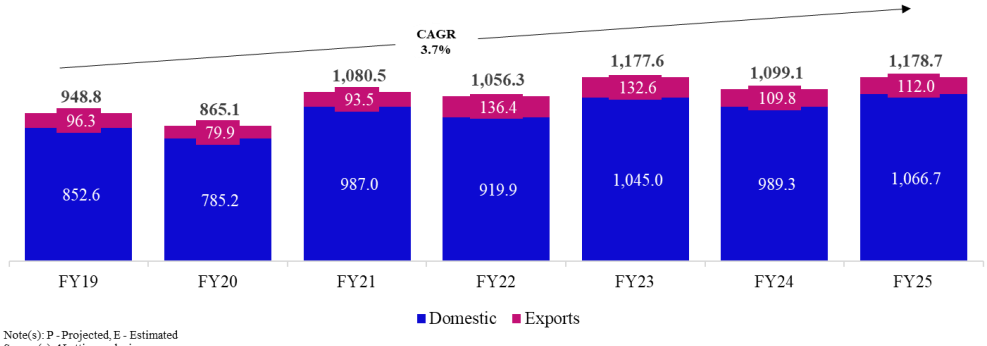


Note(s): E - Estimated, P – Projected, *includes tractors & harvesters
Source(s): 1Lattice analysis

In terms of exports, the market grew from approximately 948.8 thousand units in Fiscal 2019 to approximately 1178.7 thousand units in Fiscal 2025. In Fiscal 2019, domestic sales contributed approximately 852.6 thousand units whereas exports contributed approximately 96.3 thousand units. Growth during this period was largely driven by rising domestic demand, supported by rural mechanisation and government infrastructure push. Exports dipped in Fiscal 2024 primarily due to geopolitical conflicts and ensuing trade wars, compounded by high interest rates and an increased cost of capital.

Further exports reached approximately 112.0 thousand units in Fiscal 2025, reflecting increased penetration of Indian off-highway vehicles worldwide.

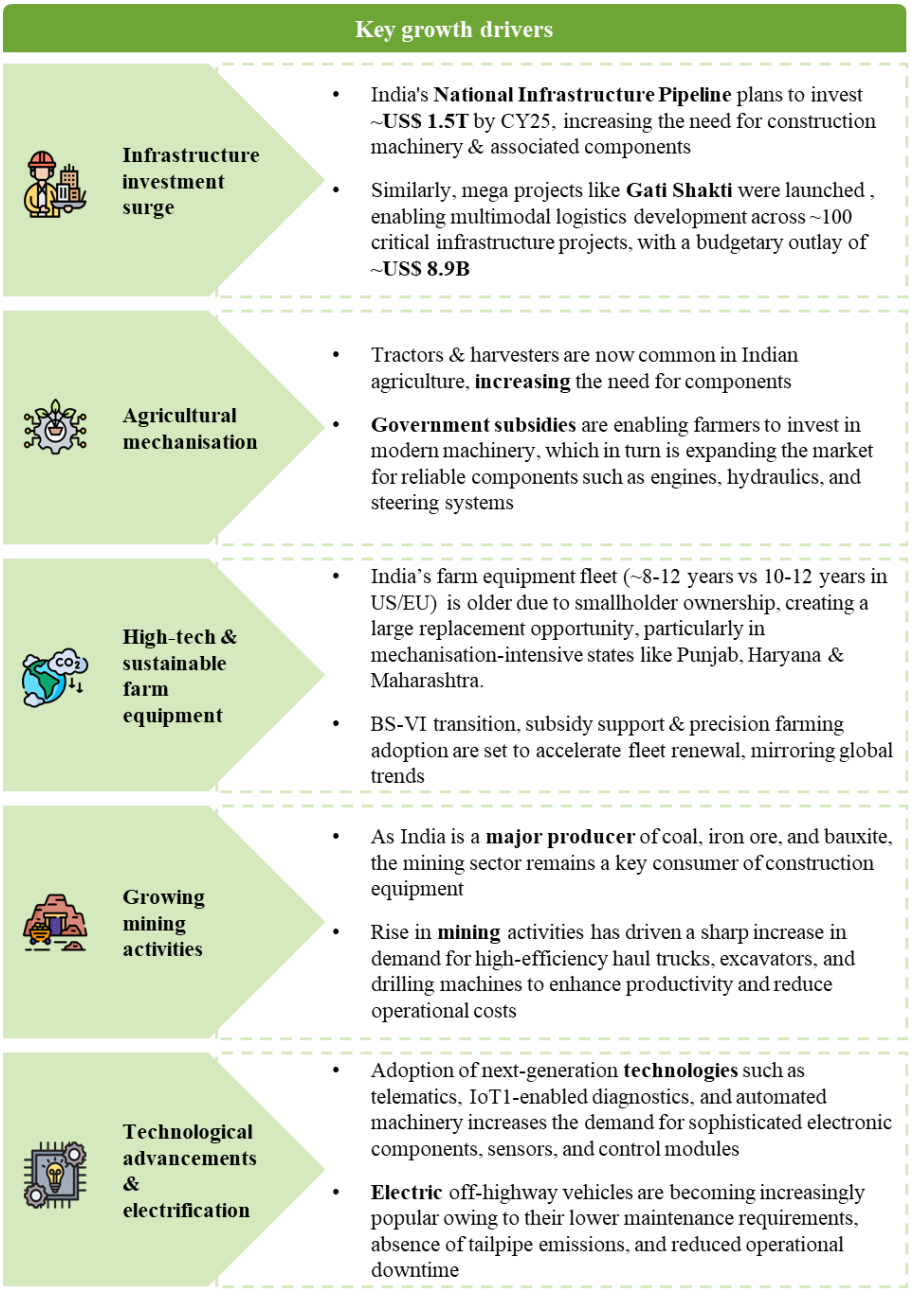
Segmentation of Indian off-highway market - By domestic & exports
(#K , FY19-25)



Note(s): P - Projected, E - Estimated
Source(s): 1Lattice analysis

Growth of India's off-highway vehicle market is driven by infrastructure investment, agricultural mechanisation, mining activities expansion & technological advancements

India's off-highway vehicle market is undergoing a major transformation, supported by policy initiatives and evolving industry needs. Government investments in large-scale infrastructure projects, along with subsidies, are promoting the adoption of modern agricultural machinery, which in turn is driving demand for durable and advanced components. Moreover, technology trends such as electrification and smart systems, spurred by stricter emission norms, are shaping market development. Expansion of mining activities is further supporting growth in this sector.



Note(s): [1]Internet of Things
Source(s): Industry reports, News articles, 1Lattice analysis

Indian agricultural equipment market is projected to grow from approximately ₹ 1,272.1 billion in Fiscal 2025 to approximately ₹ 2,100.3 billion by Fiscal 2030

The Indian agricultural equipment market grew from approximately ₹ 795.8 billion in Fiscal 2019 to approximately ₹ 1,272.1 billion in Fiscal 2025, registering a CAGR of approximately 8.1%. Unlike developed markets where mechanisation is saturated, India's growth is being shaped by its low but rising mechanisation levels & continued dominance of tractors, which account for over two-thirds of farm equipment demand. The market is expected to rise to approximately ₹ 2,100.3 billion in Fiscal 2030, with an estimated CAGR of approximately 10.5% during Fiscal 2025 to 2030, supported by rising rural incomes, demand for productivity-enhancing implements (like harvesters, tillers & planters). The prevalence of fragmented landholdings is also leading farmers to increasingly adopt shared, rented or financed equipment models, thereby improving accessibility to modern machinery beyond tractors.

Furthermore, government support is a major catalyst for growth in agricultural equipment adoption.

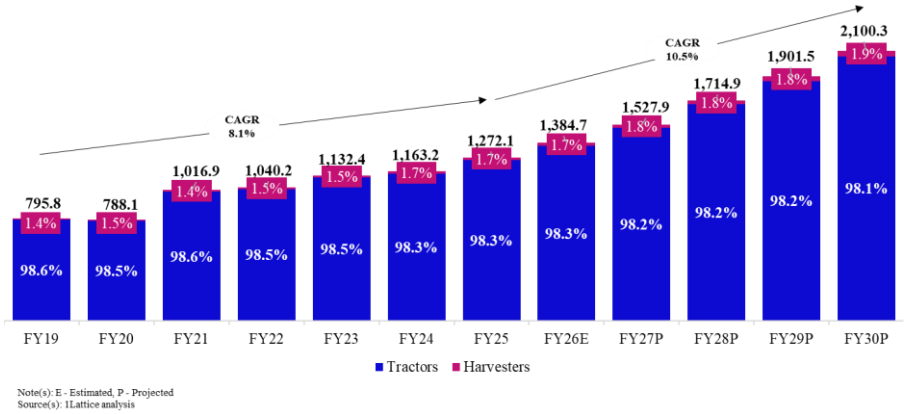
- The Ministry of Agriculture's rising budget allocations are channelled into subsidies for modern implements and machinery under schemes like **SMAM (Sub-Mission on Agricultural Mechanisation).**

- In parallel, **agriculture credit targets** set by the government are expanding access to low-interest loans, enabling small and marginal farmers to purchase or lease equipment.

- Schemes such as the **PM-Matsya Sampada Yojana** are also indirectly supporting mechanisation by boosting allied rural incomes and encouraging investment in productivity-enhancing tools.

Collectively, these measures are strengthening affordability and accessibility, complementing rising rural incomes and demand for mechanisation.

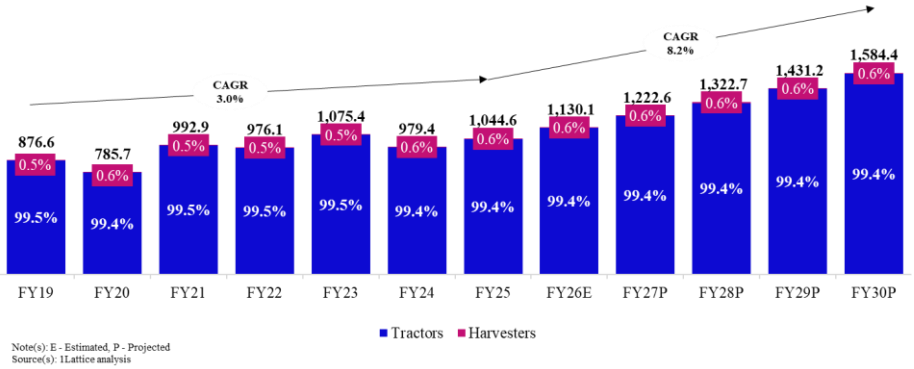
Indian agricultural equipment market - By value
(INR B, FY19-30P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

In terms of volume, the market grew from approximately 876.6 thousand units in Fiscal 2019 to approximately 1,044.6 thousand units in Fiscal 2025, with a CAGR of 3.0% during the period. Further, it is projected to grow to approximately 1,584.4 thousand units in Fiscal 2030 with an estimated CAGR of approximately 8.2% from Fiscal 2025 to 2030.

Indian agricultural equipment market - By sales volume
(#K, FY19-30P)

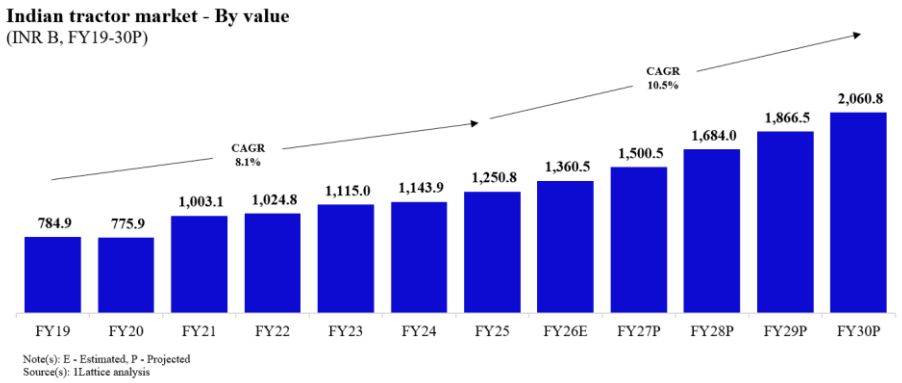


Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

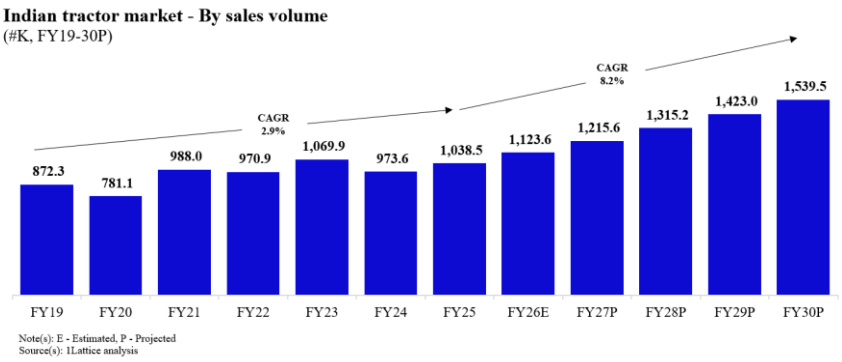
Indian tractor market grew from approximately ₹ 784.9 billion in Fiscal 2019 to approximately ₹ 1,250.8 in Fiscal 2025, with a CAGR of approximately 8.1%

The Indian tractor market grew from approximately ₹ 784.9 billion in Fiscal 2019 to approximately ₹ 1,250.8 billion in Fiscal 2025, registering a CAGR of approximately 8.1% during the same period. Market is expected to reach approximately ₹ 2,060.8 billion by Fiscal 2030, growing at a CAGR of approximately 10.5%. Market growth is primarily driven by government subsidies on tractor purchases, further supported by high seasonal demand, rising exports & the prevalence of small to mid-sized farm holdings and an accelerating transition toward stricter

emission norms that will lift replacement demand. Tractor demand typically peaks between June and November, which is driven by the arrival of the monsoon, the Kharif crop season, preparations for the upcoming rabi planting season, increased harvesting activities, and improved rural cash flow during this period.



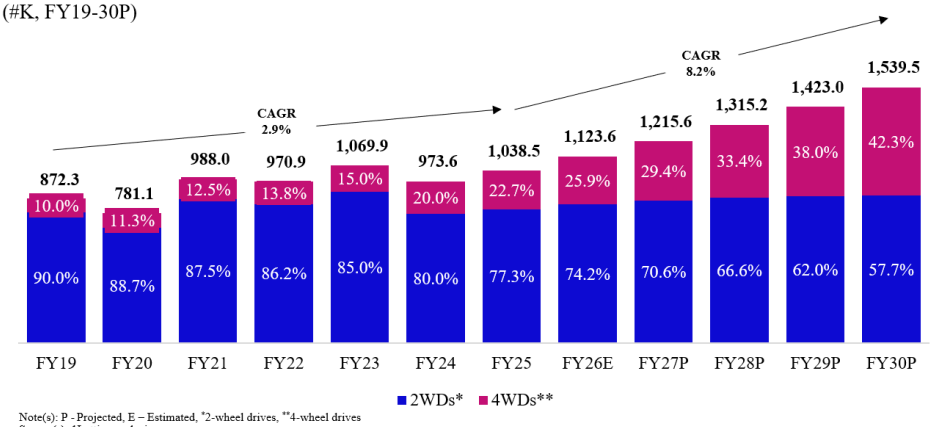
The Indian tractor market remained as the world's largest tractor market by volume, with approximately 872.3 thousand units in Fiscal 2019 to approximately 1,038.5 thousand units in Fiscal 2025, reflecting a CAGR of approximately2.9%. The market is further projected to reach approximately 1,539.5 thousand units in Fiscal 2030, growing at a CAGR of approximately 8.2% between Fiscal 2025 to 2030.



Indian tractor market is segmented into 2WDs* & 4WDs based on wheel drives, of which 2WD segment contributed the majority share of approximately 77.3% in Fiscal 2025**

Based on wheel drives, the Indian tractor market was dominated by 2WD in Fiscal 2019, with a market share of approximately 90%. Dominance of 2WDs was supported by their lower cost, fuel efficiency & suitability for small & fragmented landholdings in flat regions across northern & western India belts. 4WD tractors, contributing approximately 10%, found higher preference in hilly terrains, heavy black-soil belts & paddy-growing regions of the south & east, along with some parts of Maharashtra, where superior traction & power were essential. By Fiscal 2025, the 2WD share moderated to approximately 77% while 4WDs expanded to approximately 23%, driven by rising mechanisation efforts, demand for higher horsepower tractors & greater adoption in cash-crops. Going forward, 2WDs are projected to further decline to approximately 58% by Fiscal 2030, with 4WDs increasing to approximately 42%, reflecting structural shifts toward larger landholdings, multi-purpose usage & farming activities in challenging terrains. With demand for 4WDs tractors growing in future, OEMs are exploring options to offload the assembly.

Segmentation of Indian tractor market - By wheel drives
(#K, FY19-30P)



Note(s): P - Projected, E – Estimated, *2-wheel drives, **4-wheel drives
Source(s): 1Lattice analysis

Indian tractor market is segmented into <30HP, 31 to 50 HP & >50 HP based on horsepower, of which the 30 to 50 HP segment contributed the majority share of approximately 78.0% in Fiscal 2025

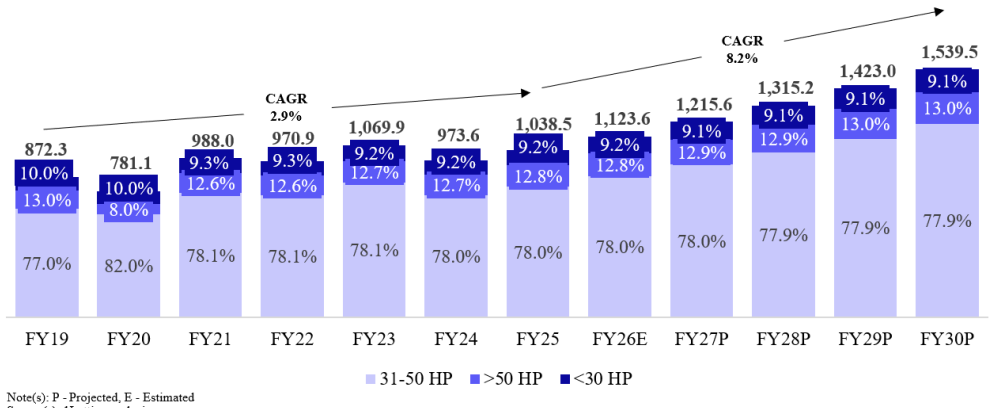
In Fiscal 2025, the Indian tractor market, with a total sales volume of approximately 1,038.5 thousand units, was segmented into three main horsepower categories. The market is projected to grow to approximately 1,539.5 thousand units by Fiscal 2030.

- **Less than 30 HP (<30 HP):** The <30 HP segment constitutes niche part of the market with a market share of approximately 9.2% share in Fiscal 2025. This segment largely caters to the needs of small and marginal farmers in India. Its market is expected to reach approximately 9.1% by Fiscal 2030. The primary growth drivers for this segment are its cost-effectiveness and its suitability for basic agricultural operations in smaller, fragmented landholdings.

- **31 to 50 HP:** The 31 to 50 HP segment is the largest category, holding approximately 78.0% market share in Fiscal 2025. These tractors are versatile and serve the needs of medium-sized farms by offering higher power for a wider range of applications, such as tillage, haulage, and the use of multiple implements. The trend for this segment indicates a steady market, with its market share projected to be around approximately 77.9% by Fiscal 2030 as demand shifts towards smaller, more affordable tractors and highly specialised, powerful ones.

- **More than 50 HP (>50 HP):** The >50 HP segment held approximately 12.8% share in Fiscal 2025. This category is primarily deployed for specialised heavy-duty tasks and in large-scale commercial farming operations where high power is essential. Reflecting its specialised application base, this segment's share is expected to grow and is projected to contribute approximately 13.0% to the market by Fiscal 2030.

Segmentation of Indian tractor market - By horsepower
(#K, FY19-30P)



Note(s): P - Projected, E - Estimated
Source(s): 1Lattice analysis

Indian tractor market exports grew from approximately 92.3 thousand units in Fiscal 2019 to approximately 98.8 thousand units in Fiscal 2025 with total tractor market reaching approximately 1,038.5

thousand units in the same year

India's tractor market grew from approximately 872.3 thousand units in Fiscal 2019 to approximately 1,038.5 thousand units in Fiscal 2025. In Fiscal 2019, domestic sales contributed approximately 780.0 thousand units while exports contributed approximately 92.3 thousand units. Domestic growth was supported by steady rural demand, farm mechanisation, and government support programs, while exports saw traction in select developing markets. Further, domestic sales grew to approximately 842.3 thousand units in Fiscal 2022, with exports reaching approximately 128.6 thousand units, reflecting stronger overseas acceptance of Indian tractors. Moving on, in Fiscal 2025, domestic sales reached approximately 939.7 thousand units, whereas exports contributed approximately 98.8 thousand units to the market, as domestic demand remained resilient while exports corrected from earlier highs. This downturn in the export market was primarily caused by significant economic headwinds in key destinations, including the US, EU, and Turkey, which faced recessionary trends, high inflation, and currency devaluation. Compounding these challenges, prolonged geopolitical tensions, such as the war in Ukraine and subsequent sanctions, disrupted global trade flows and further dampened demand.

- **Key trends:**

    - **Government initiatives towards farm mechanisation**: Government initiatives have played a critical role in promoting mechanisation & supporting tractor demand. The Sub-Mission on Agricultural Mechanisation (SMAM), launched in Fiscal 2015, has been central to this effort, aiming to make machines accessible & affordable for small & marginal farmers. Under this, custom hiring centres (CHCs), hi-tech hubs, & farm machinery banks have been established across the country, particularly in rural & agriculture-intensive regions, to expand access to farm machinery. To support widespread adoption, approximately ₹ 4,557 crore was allocated from Fiscal 2015 to 2021 under SMAM, enabling the distribution of approximately 13 lakhs machines & establishment of approximately 27.5 thousand custom hiring institutions across India. With such initiatives, farm power availability increased from approximately 2.02 kW/ha in Fiscal 2017 to approximately 2.49 kW/ha in Fiscal 2019, driving wider adoption of tractors & machinery.

    - **Increasing localisation and reduced import reliance:** With government emphasis on "Make in India" and supply chain resilience, OEMs are increasingly sourcing components domestically to cut import dependence. This shift is creating opportunities for local suppliers to become critical partners in the manufacturing ecosystem. Domestic players stand to benefit by catering to OEM requirements, as localisation not only reduces costs but also strengthens India's competitive positioning in global agricultural equipment exports.

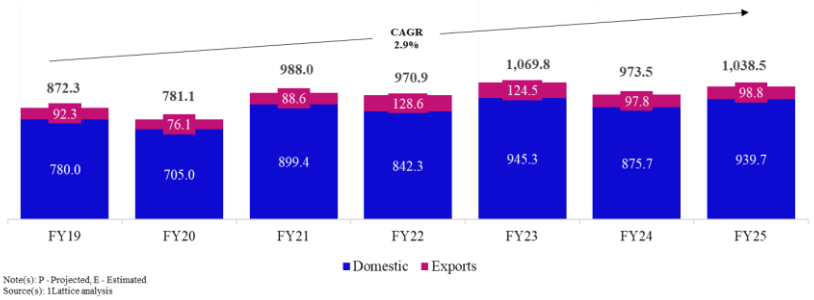
    - **Emerging export destinations:** New countries are emerging as key destinations for Indian tractor exports, with the U.S. leading at approximately 22.0% share in Fiscal 2024, followed by Brazil (approximately 7.9%), Mexico (approximately 7.1%) & Bangladesh (approximately 5.4%). These markets offer significant headroom for growth, supported by rising mechanisation in agriculture, growing demand for affordable & durable machinery & India's competitive manufacturing base.

    - **Regulatory push with TREM-IV and upcoming TREM-V norms:** The phased rollout of TREM-IV emission regulations and the planned TREM-V standards are compelling tractor OEMs to adopt cleaner engine technologies. While these norms raise compliance costs, they are expected to significantly enhance India's readiness for regulation-driven global markets, aligning domestic manufacturers with export destinations that already mandate stringent emission standards.

    - **Shift towards higher HP tractor models:** The market is witnessing a gradual shift towards higher horsepower tractors, driven by multiple factors. Farmers increasingly prefer to drive tractors themselves rather than rely on hired drivers, making higher HP models more attractive for ease of use. Additionally, farming is becoming more organised, requiring powerful equipment to manage larger operations. A growing shortage of agricultural labour has further supported the transition, as higher HP tractors improve efficiency & reduce dependency on the manual workforce.

These structural drivers are expected to sustain long-term growth in India's tractor market. Continued policy support, export diversification & evolving farmer preferences are likely to further strengthen demand momentum.

Segmentation of Indian tractor market - By domestic & exports
(#K , FY19-25)



Note(s): P -Projected, E - Estimated
Source(s): 1Lattice analysis

The decline in agricultural tractor exports in Fiscal 2024 was primarily due to high inflation in major markets like Europe and the US. This led to "hobby farmers" in those countries delaying their purchase decisions, as they anticipated interest rates would come down in the future. As soon as inflation starts to subside in the US and Europe, there is expected to be a rebound in demand for the 50-100 HP "hobby farming" tractors, which are a major export segment for Indian agricultural tractor manufacturers.

Key challenges & threats to the Indian tractor market

Despite the steady growth & government support, India's tractor market continues to face several structural challenges that constrain large-scale adoption of mechanisation. Small & fragmented landholdings, high upfront costs of equipment, limited financing options, lack of awareness & inadequate after-sales infrastructure remain persistent bottlenecks. These factors, coupled with poor reach into rural interiors & heavy dependence on small & marginal farmers, create significant hurdles that OEMs, policymakers & ecosystem stakeholders must address to unlock the full potential of farm mechanisation in India.

Mahindra & Mahindra, Swaraj, Sonalika, & TAFE serve as the key players in the Indian tractor market, with a collective market share of 66.6%

Mahindra & Sonalika leading the market in terms of volume. On the other hand, John Deere holds a strong market position in the premium equipment segment.

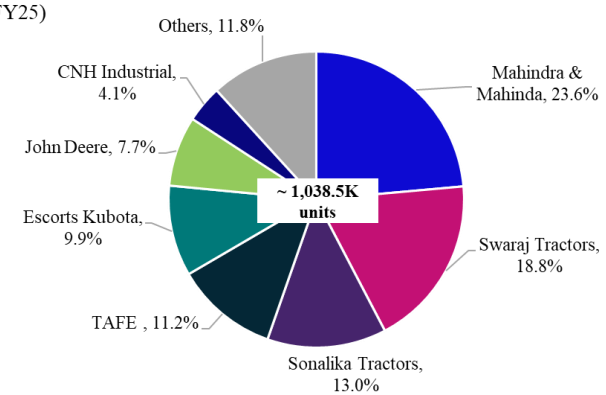
Becoming a supplier to leading agri-equipment OEMs in India is a highly competitive process, driven by stringent qualification requirements & global best practices. Suppliers must demonstrate excellence in quality, sustainability, and compliance while passing rigorous evaluations to be part of OEM vendor ecosystems.

Milestone Gears is a trusted supplier to all seven major tractor brands in India, including Mahindra, Swaraj, Sonalika, TAFE, Escorts, Kubota, John Deere & CNH Industrial, covering approximately 88% of the domestic tractor market & underscoring its extensive presence across the country's tractor industry.

Drivers and opportunities for Indian suppliers:

- **Stringent qualification requirements**
    - Mandatory certifications such as ISO 9001:2015, which is a globally recognised quality management system (QMS) standard ensuring consistent quality & process efficiency
    - Adherence to sustainable procurement, quality, technical, and environmental standards.
    - Successful completion of rigorous audits and compliance with customer-specific quality management systems.
- **Impact of global sourcing shifts**
    - China+1 strategy has increased global OEM interest in Indian suppliers.
    - India's lower costs, skilled workforce, and policy reforms (e.g., Make in India, PLI schemes) make it a preferred sourcing hub.
- **Opportunities for Indian suppliers**
    - Growing global OEM investments and localisation of manufacturing open avenues for expansion.
    - FDI inflows and market liberalisation enhance supplier integration prospects.
- **OEM priorities enabling supplier growth**
    - Focus on building resilient supply chains.
    - Increased emphasis on customising products for local market needs.

Key players in the Indian tractor market - By sales volume
(%, FY25)



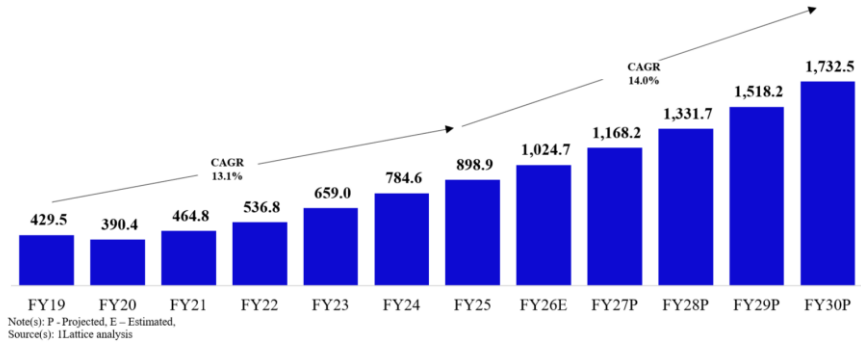
Source(s): Company websites, 1Lattice analysis

Indian construction equipment market is projected to grow from approximately ₹ 429.5 billion in Fiscal 2019 to approximately ₹ 898.9 billion in Fiscal 2025

The Indian construction equipment market grew from approximately ₹ 429.5 billion in Fiscal 2019 to approximately ₹ 898.9 billion in Fiscal 2025, reflecting competition in India and overseas CAGR of approximately 13.1% during the period. This growth was largely fueled by rapid urbanisation and significant infrastructure development initiatives. Government efforts to enhance modern infrastructure spurred a notable increase in demand for construction vehicles, supported by sustained infrastructure spending and a recovery in real estate

activity, which lifted equipment demand. Further, the market is projected to reach approximately ₹ 1,732.5 billion by Fiscal 2030, expanding at a CAGR of approximately 14.0% from Fiscal 2025 to 20 30, driven by increased adoption of advanced & technology-enabled machinery, rising preference for premium models, higher selling prices & access to financing options that support uptake of higher-value equipment.

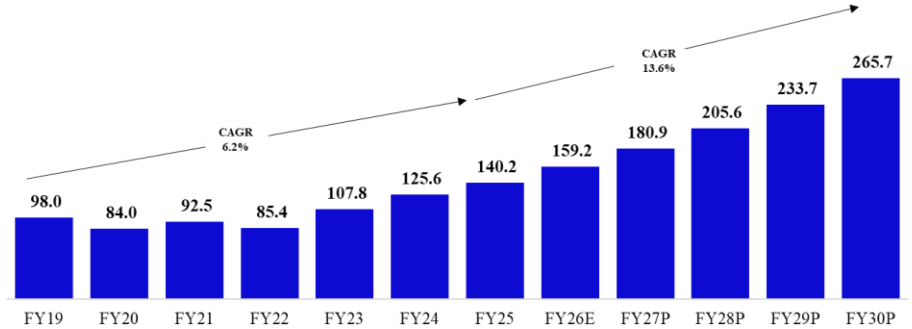
India construction equipment market - By value
(INR B, FY19-30P)



Note(s): P - Projected, E – Estimated,
Source(s): 1Lattice analysis

In terms of volume, the market grew from approximately 98.0 thousand units in Fiscal 2019 to approximately 140.2 thousand units in Fiscal 2025, reflecting a CAGR of approximately 6.2% during the period. Growth was supported by sustained government infrastructure spending & recovery in real estate activity. Further, the market is projected to reach approximately 265.7 thousand units in Fiscal 2030, expanding at a CAGR of approximately 13.7% from Fiscal 2025 to 2030, backed by large-scale infrastructure rollout & faster adoption of advanced machinery.

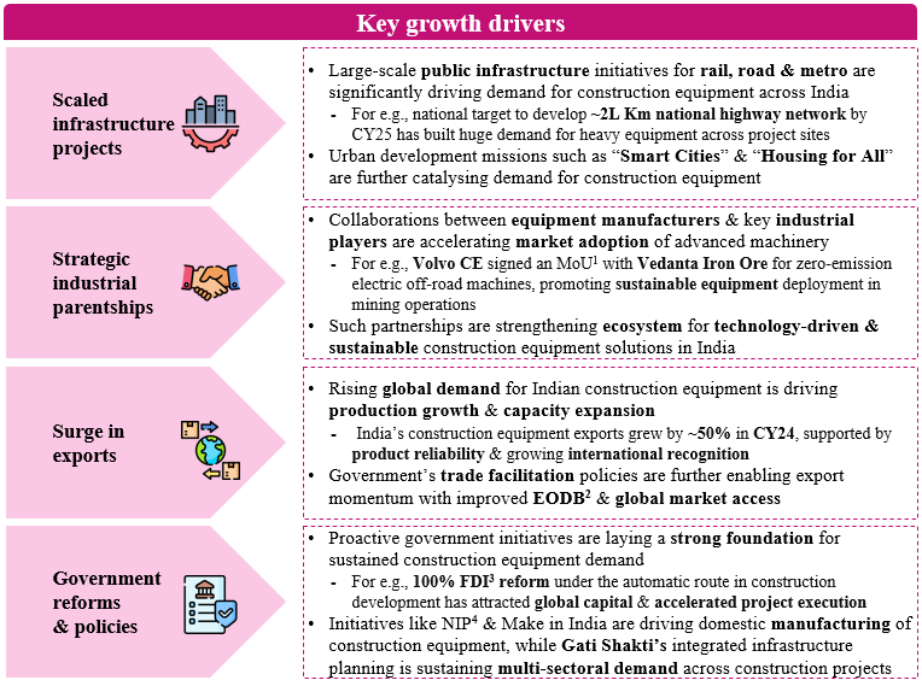
India construction equipment market - By sales volume
(#K, FY19-30P)



Note(s): P - Projected, E – Estimated,
Source(s): 1Lattice analysis

Growth of the construction equipment market in India is driven by large-scale infrastructure projects, key industry partnerships, rising exports & supportive government policies

The Indian construction equipment market is witnessing strong growth, fuelled by large-scale infrastructure development across rail, road & metro segments. This growth is further led by rising strategic collaborations within the industry. Increase in exports coupled with growing global demand & enabling policy environment has further accelerated momentum, positioning India as the third-largest construction equipment market globally.



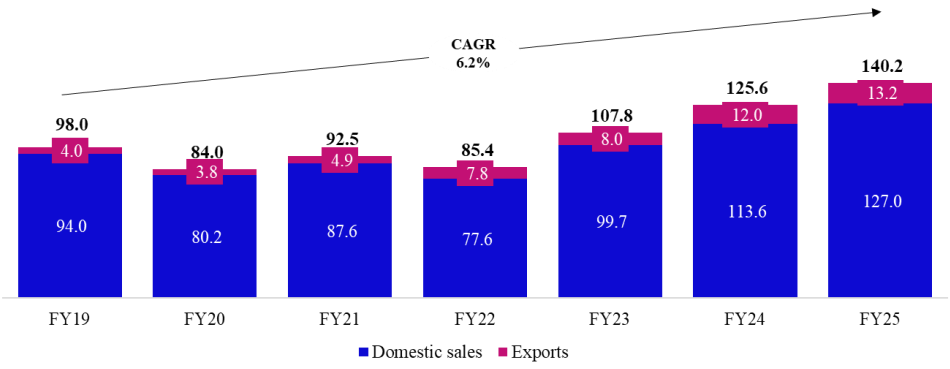
Note(s): [1]Memorandum of understanding, [2]ease of doing business, [3]foreign direct investment, 4National Infrastructure Pipeline

Exports of construction equipment from India contributed approximately 4.0 thousand units in Fiscal 2025, with domestic sales contributing approximately 127.0 thousand units

Indian construction equipment exports rose from approximately 4.0 thousand units in Fiscal 2019 to approximately 13.2 thousand units in Fiscal 2025. This rise in exports in Fiscal 2025 was driven by increased demand from emerging economies like those in the U.S. & the UAE. Meanwhile, domestic demand was fuelled by increased infrastructure spending & surge in public-private partnerships across the construction equipment industry.

In Fiscal 2024, the leading export destinations for Indian construction equipment were Ghana (approximately 11.7% share), the United States (approximately 10%), the United Arab Emirates (approximately 9.4%), and Saudi Arabia (8.0%). These markets hold strong growth potential, supported by ongoing infrastructure development programs, urban expansion & investment in large-scale construction projects, which could further boost export volumes in the coming years.

Segmentation of Indian construction equipment market - By domestic & exports
(# K, FY19-25)

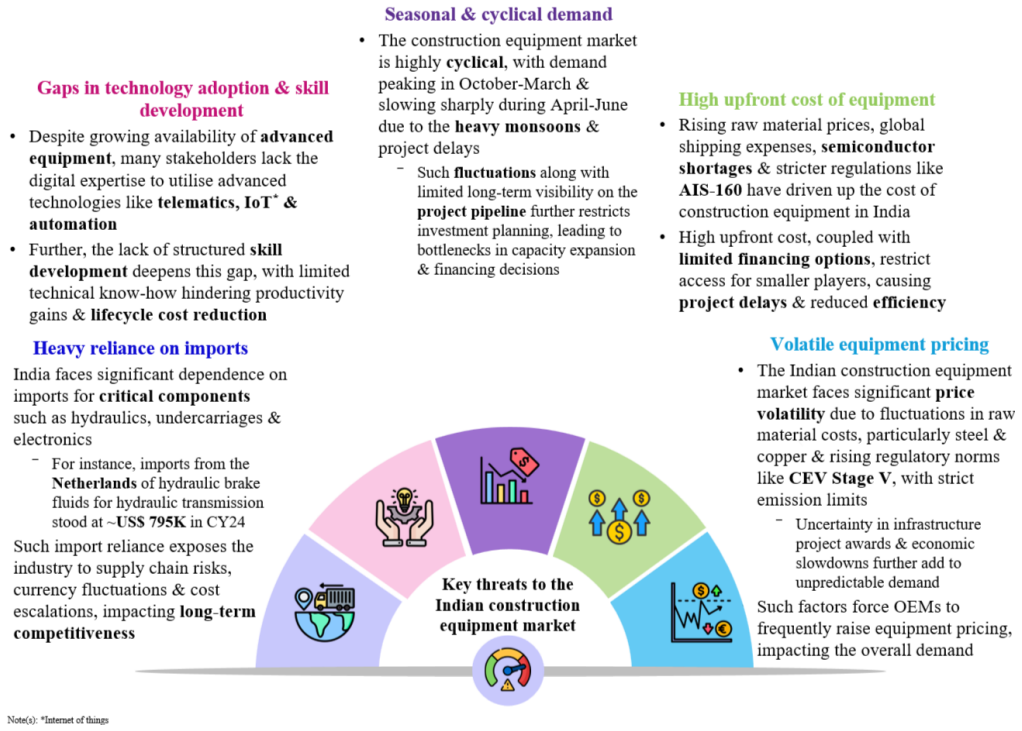


Note(s): P - Projected, E - Estimated
Source(s): 1Lattice analysis

Key threats & challenges in the Indian construction equipment market

The Indian construction equipment market faces several key challenges & threats arising from a confluence of factors. High upfront equipment costs, limited financing options, reliance on imported components, volatile raw

material prices & stricter regulatory norms like AIS-160 and CEV Stage V are placing pressure on OEMs & project operators alike. These dynamics not only increase operational costs but also create uncertainties in project execution, restrict access for smaller players & impact overall industry efficiency & competitiveness.



Leading OEM players like JCB, Caterpillar, SANY & Volvo CE are expanding their plant capacities in the Indian construction equipment space

The Indian construction equipment industry is witnessing significant capacity expansion, with both global & domestic OEMs making large-scale investments. New facilities, parts centres & production hubs are being set up across key locations, focusing on localisation, digital upgrades & sustainable machinery. These developments are aimed at boosting output, strengthening supply reliability, & positioning India as a global manufacturing hub while meeting rising domestic demand.

Capacity expansion by key OEMs

OEM	Capacity expansion
JCB India	• In FY21, JCB India inaugurated its **largest parts centre**, spanning ~**14K sq. m**, to cater to Northern India, raising its total warehouse capacity to ~**29K sq. m** across key hubs including Pune, Bengaluru, Kolkata & Guwahati - In FY25, the company is further set to invest ~**USD 59.8M** in its Vadodara plant, focusing on advanced equipment & digital upgrades to boost capacity
Caterpillar Inc.	• In FY24, Caterpillar Inc. signed an **MoU** with the Tamil Nadu government to invest ~**USD 59.8M** in expanding its plant capacity, reinforcing its manufacturing footprint in India
SANY India	• In FY25, SANY India expanded its Pune facility to enhance production & localisation, with an annual capacity of ~**14K units** & fabrication capacity of over ~**1L TPA**
Volvo CE	• In FY25, Volvo CE announced an investment of ~**USD 167.7M** to establish a global hub in Bengaluru for trucks, buses & electric machinery - With this, the production is set to increase from ~**3K to ~20K** trucks & buses annually, catering to both Indian & international markets

Automotive market - Industry overview

The automotive industry encompasses vehicles designed for passenger transport, commercial logistics & two-wheeled mobility solutions. These vehicles serve diverse applications across personal, industrial & public transportation, with demand shaped by economic activity, urbanisation, regulatory frameworks & technological adoption.

- **Passenger vehicles** include cars, SUVs & crossovers, primarily used for personal & family mobility. In Calendar Year 2024, passenger vehicles contributed approximately 67.5 million units to the global automotive market, making them the largest segment by volume. Key factors driving demand include rising urbanisation, increasing disposable incomes, and growing consumer preference for comfort, safety, and connected technologies.

- **Commercial vehicles** include trucks, buses & vans, supporting logistics, freight, and public transportation. In Calendar Year 2024, commercial vehicles accounted for approximately 17.6% of the global market by volume. Their demand is being driven by the growth of hub-and-spoke logistics models for e-commerce, a sharp focus from operators on optimising the total cost of ownership (TCO), and the integration of telematics (using sensors and wireless networks to provide insights and enable remote monitoring and management) for enhanced fleet efficiency.

- **Two-wheelers** include motorcycles, scooters & mopeds, widely used in emerging markets for affordable personal transport and last-mile mobility. In Calendar Year 2024, two-wheelers accounted for approximately 39.5% of the global market by volume. Affordability, fuel efficiency & urban congestion drive adoption in countries like India and Southeast Asia.

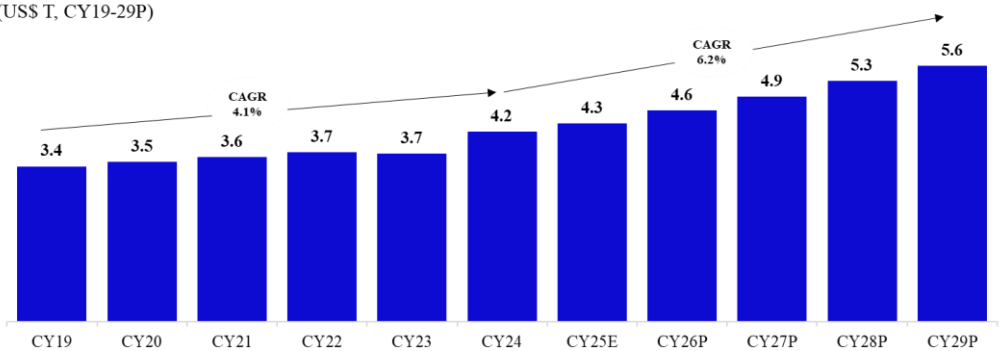
Vehicles across all segments are increasingly influenced by electrification, digital connectivity, and autonomous technologies, which are transforming product design, manufacturing processes, and customer usage patterns. Overall market growth is underpinned by urbanisation, income growth, evolving consumer preferences, and regulatory pushes toward cleaner, safer, and more efficient mobility solutions.

Global automotive market is projected to grow from USD 4.2 trillion in Calendar Year 2024 to approximately USD 5.6 trillion in Calendar Year 2029

The global automotive market expanded from approximately USD 3.4 trillion in Calendar Year 2019 to approximately USD 4.2 trillion in Calendar Year 2024, registering a CAGR of approximately 4.1%. Growth during this period was supported by post-COVID recovery in mobility demand, easing semiconductor shortages & rising replacement demand in developed economies. Looking ahead, the market is projected to reach approximately USD 5.6 trillion by Calendar Year 2029, expanding at a CAGR of approximately 6.2% over Calendar Year 2024 to 2029.

Key drivers include increasing electrification supported by regulatory push, rising adoption of connected & autonomous technologies, and premiumisation trends. In addition, strong demand momentum from emerging markets, fuelled by urbanisation & income growth, is expected to sustain overall industry expansion.

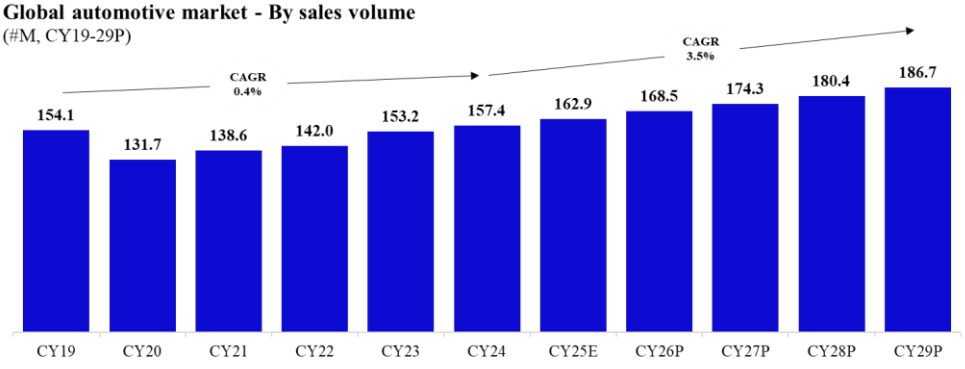
Global automotive market - By value
(US$ T, CY19-29P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

In terms of volume, the market grew from approximately 154.1 million units in Calendar Year 2019 to approximately 157.4 million units in Calendar Year 2024, registering a CAGR of approximately 0.4%. Over Calendar Year 2024 to 2029, volumes are projected to rise further to approximately 186.7 million units, expanding at a CAGR of approximately 3.5% during the period.

Global automotive market - By sales volume
(#M, CY19-29P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

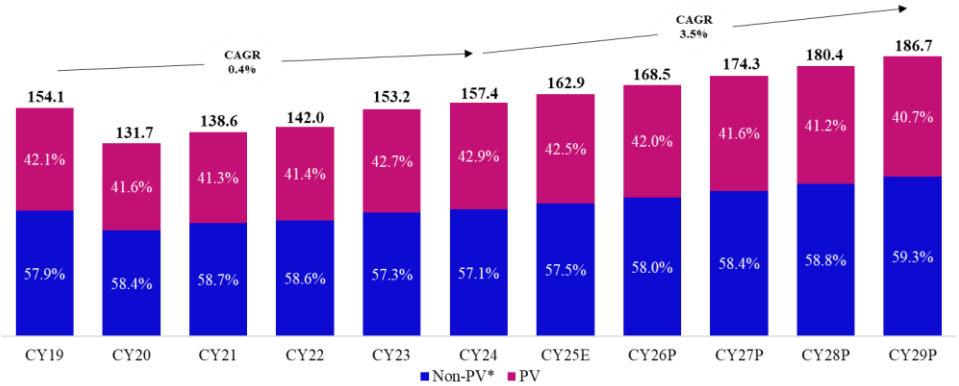
Global automotive market is segmented into passenger vehicles & non-passenger vehicles, with non-passenger vehicle leading in Calendar Year 2024

The global automotive market is segmented into passenger vehicles & non-commercial vehicles (2 wheelers % commercial vehicles). In Calendar Year 2019, passenger vehicles held approximately 42.1% share, supported by rising urbanisation, improving income levels & growing demand for personal mobility. Non-passenger vehicles followed at approximately 57.9% driven by two-wheeler's affordability & strong uptake in emerging markets.

By Calendar Year 2024, passenger vehicles slightly improved their share to approximately 42.9%, fuelled by premiumisation trends & higher EV adoption in developed markets. Non-passenger vehicles stood at approximately 57.1%.

Looking ahead to Calendar Year 2029, passenger vehicles are expected to consolidate to approximately 40.7%, reflecting a structural shift. For non-passenger vehicles, affordability will continue to sustain two-wheeler volumes, and commercial vehicles are expected to be supported by industrial activity & infrastructure spending.

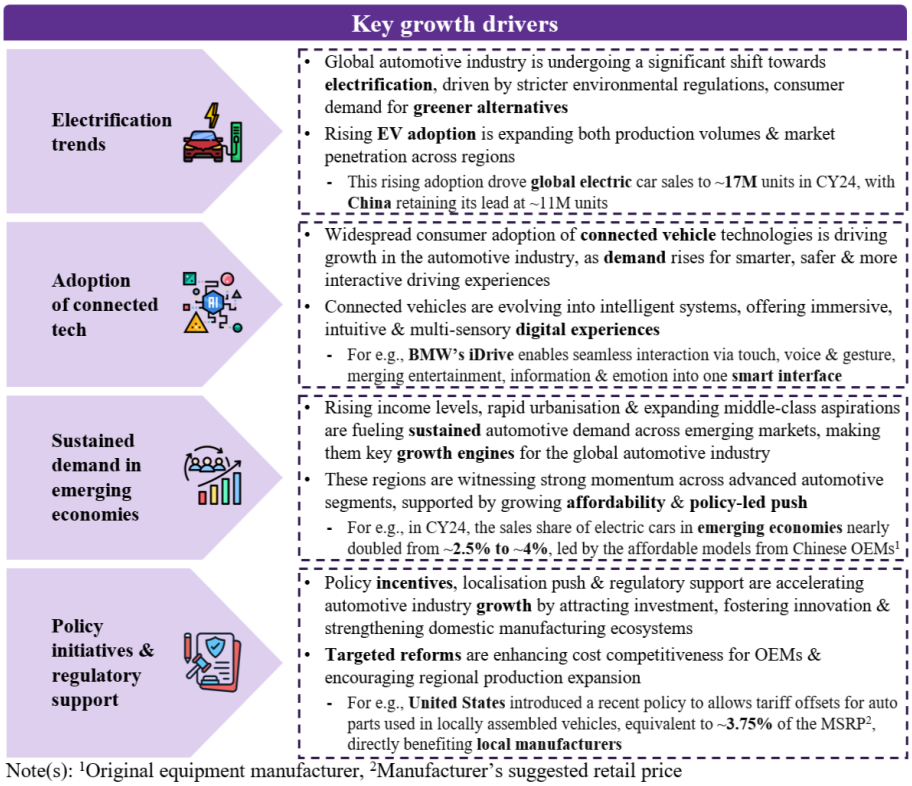
Segmentation of global automotive market - By vehicle category
(# M, CY19-29P)



Note(s): E - Estimated, P – Projected, *Includes 2-wheelers, 3-wheelers & commercial vehicles
Source(s): 1Lattice analysis

Global automotive industry growth is driven by rising electrification, connected technology, sustained demand & regulatory push

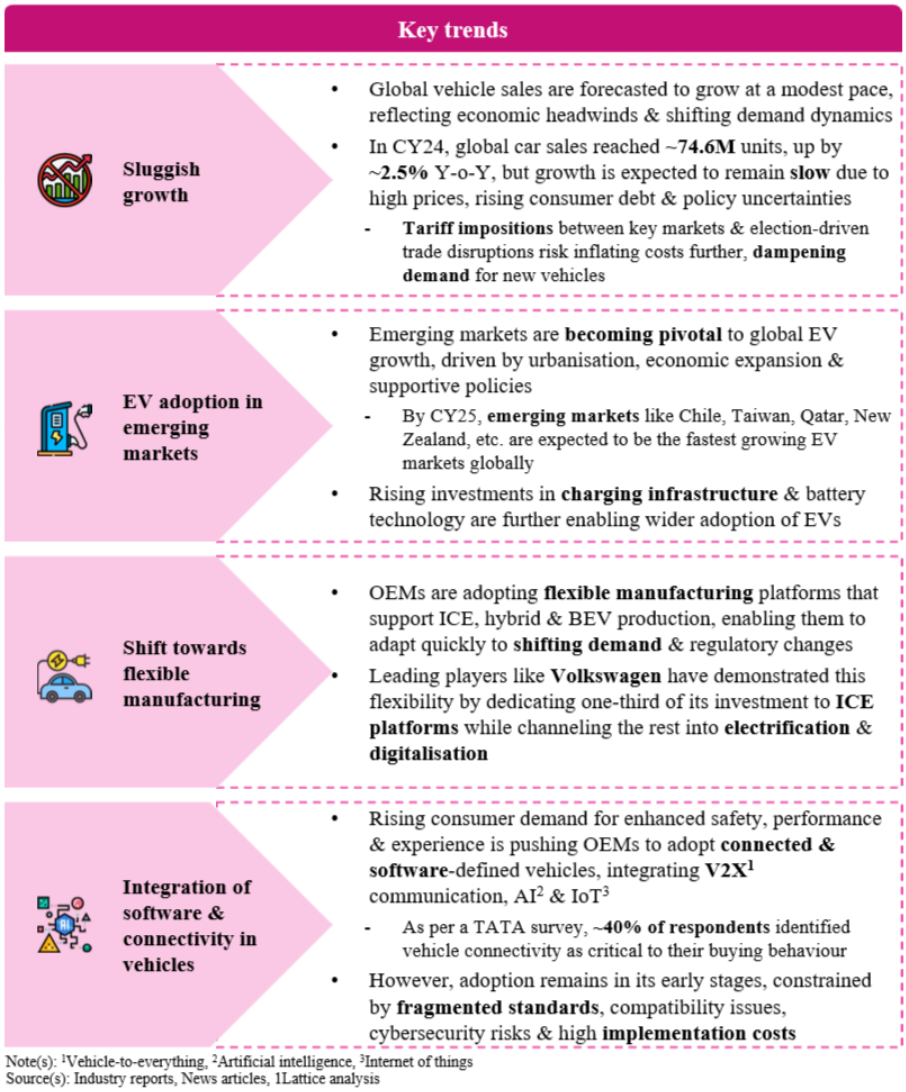
The global automotive industry is being reshaped by four key forces: rising electrification, rapid adoption of connected technologies, sustained demand from emerging markets & strong regulatory push. These drivers are accelerating innovation, strengthening supply chains, and expanding both production & consumption footprints worldwide.



Note(s): [1]Original equipment manufacturer, [2]Manufacturer's suggested retail price

Rising EV adoption, flexible manufacturing, technological integration & market growth are key trends in the global automotive market

The global automotive industry is undergoing a structural shift, marked by modest sales growth, accelerating EV adoption in emerging markets & OEMs increasingly leveraging flexible manufacturing platforms. At the same time, deeper integration of software & connectivity is transforming vehicles into smarter, more adaptive ecosystems.

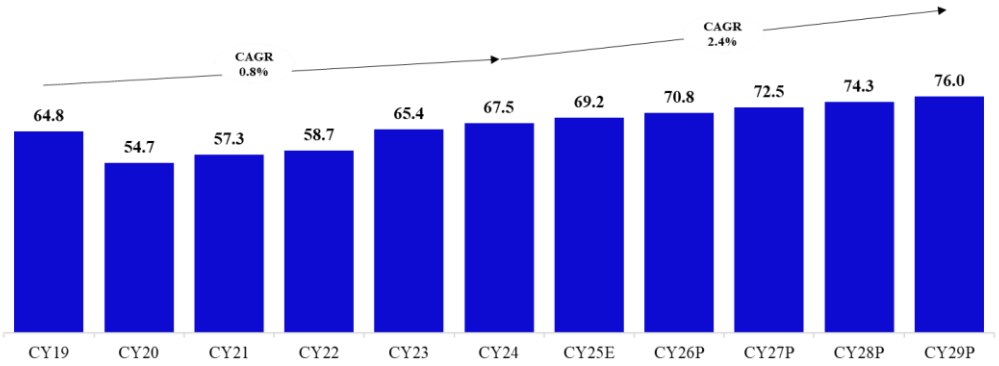


Note(s): [1]Vehicle-to-everything, [2]Artificial intelligence, [3]Internet of things
Source(s): Industry reports, News articles, 1Lattice analysis

Global passenger vehicle market is projected to grow from approximately 67.5 million units in Calendar Year 2024 to approximately 76.0 million units by Calendar Year 2029

The global passenger vehicle market grew from approximately 64.8 million units in Calendar Year 2019 to approximately 67.5 million units in Calendar Year 2024, registering a modest CAGR of approximately 0.8% amid demand slowdown & supply-chain disruptions. By Calendar Year 2029, volumes are projected to reach approximately 76.0 million units, reflecting a stronger CAGR of approximately 2.4% over Calendar Year 2024 to 2029, supported by recovering consumer demand, electrification push & expansion in emerging markets, though growth remains moderate as mature markets near saturation.

Global passenger vehicle market - By sales volume
(#M, CY19-29P)

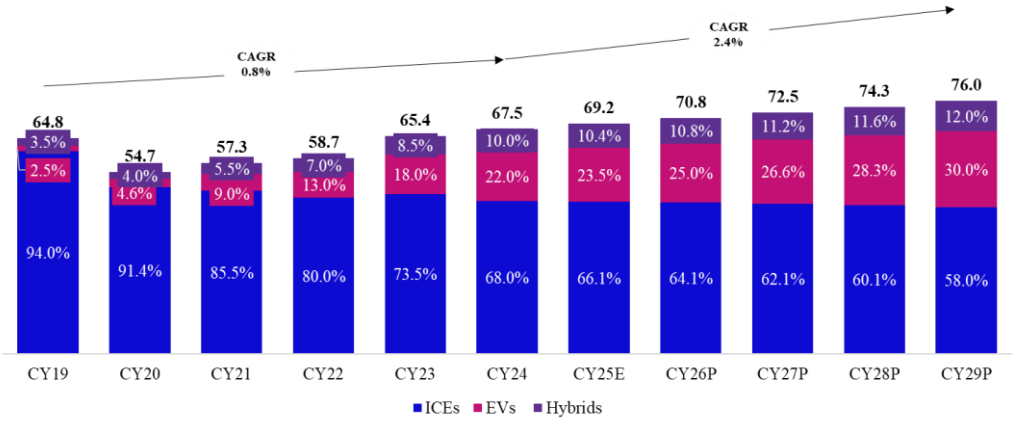


Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

EVs expected to make up nearly third of global passenger vehicle market by Calendar Year 2029, up from approximately 22% in Calendar Year 2024

The global passenger vehicle market is segmented into ICEs, EVs & hybrids. In Calendar Year 2019, ICEs dominated with approximately 94.0% share, while EVs & hybrids held approximately 2.5% & approximately 3.5% respectively. By Calendar Year 2024, ICEs declined to approximately 68.0%, as EVs surged to approximately 22.0% & hybrids to approximately 10.0%, highlighting the rapid shift toward alternative powertrains. By Calendar Year 2029, ICEs are expected to further moderate to approximately 58.0%, with EVs expanding to approximately 30.0% & hybrids to approximately 12.0%, marking a decisive transition in global market composition.

Segmentation of global passenger vehicle market - By powertrain mix
(#M, CY19-29P)

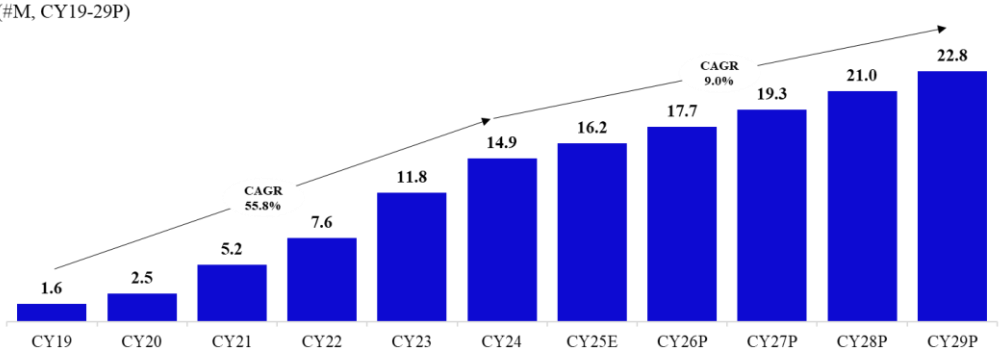


Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

Global passenger EV market is projected to grow from approximately 14.9 million units in Calendar Year 2024 to approximately 22.8 million units in Calendar Year 2029

Global passenger EV sales surged from approximately 1.6 million units in Calendar Year 2019 to approximately 14.9 million units in Calendar Year 2024, recording a strong CAGR of approximately 55.8%. The market is projected to expand further to approximately 22.8 million units by Calendar Year 2029, though at a slower CAGR of approximately 9.0% over Calendar Year 2024 to 2029. While early-stage growth was rapid, future expansion will be driven by rising consumer preference for green mobility & wider adoption across markets, supporting sustainable long-term momentum.

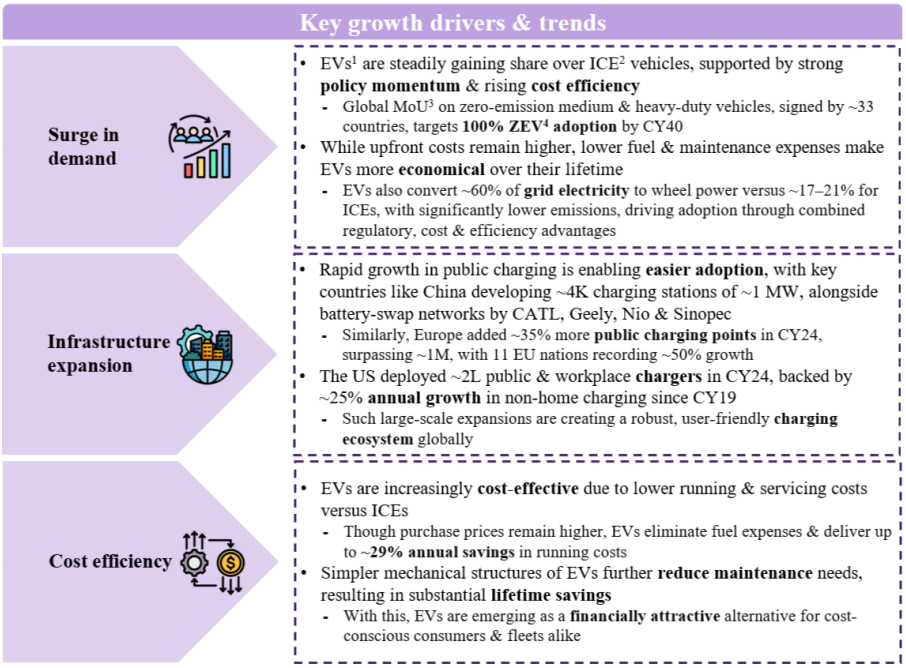
Global passenger EV market - By sales volume
(#M, CY19-29P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

Key drivers & trends:

Electric vehicles are witnessing strong global momentum, driven by rising demand, rapid infrastructure expansion & increasing cost efficiency. Supportive policies, technological advancements & large-scale charging deployments are accelerating adoption across key markets. At the same time, lower running costs, maintenance savings & efficiency gains are positioning EVs as a financially attractive alternative to ICEs vehicles, shaping the future of sustainable mobility.



Note(s): [1]Electric vehicle, [2]Internal combustion engine, [3]Memorandum of understanding, [4]Zero-emission vehicle

Key government initiatives driving EV adoption across the globe

- **Accelerated ZEV targets:** Governments worldwide are setting ambitious targets to boost zero-emission vehicle (ZEV) adoption across light- and heavy-duty segments. These policies aim to reduce greenhouse gas emissions, promote clean mobility, and drive the transition away from internal combustion engines. For instance, the Canadian government has set ZEV sales targets for light-duty vehicles at 26% by Calendar Year 2026, 90% by Calendar Year 2030, and 100% by Calendar Year 2035. Similarly, Belgium, as a signatory to the global MOU on Zero-Emission Medium- and Heavy-Duty Vehicles, targets 30% ZEV sales in medium- and heavy-duty vehicles by Calendar Year 2030 and 100% by Calendar Year 2040.

- **Rising subsidies for EV purchase & adoption:** To accelerate EV adoption & reduce upfront costs, several countries are introducing targeted financial incentives. For instance, the French government provides

subsidies covering approximately 30% of the cost for installing publicly accessible EV chargers. Similarly, Georgia promotes EV adoption through VAT exemptions & reduced import taxes for electric & hybrid vehicles. In Morocco, the government offers reduced duties, green loans & subsidies, along with exemptions from luxury & road taxes for EVs.

- **Push towards zero emission:** Governments are setting ambitious regulatory targets to phase out ICE vehicles & accelerate the transition to zero-emission mobility. For example, New Zealand, as a signatory to the COP26 ZEV Declaration, aims for all sales of new cars and vans in leading markets to be zero-emission by no later than Calendar Year 2035. Similarly, Norway targets 100% zero-emission acquisitions for light-duty vehicles in civil government fleets by Calendar Year 2035, with additional goals for medium- and heavy-duty vehicles like city buses to be ZEV or biogas by Calendar Year 2025

Such global policy measures are fostering widespread EV adoption worldwide, supporting a decisive shift from traditional ICE vehicles toward cleaner & zero-emission mobility.

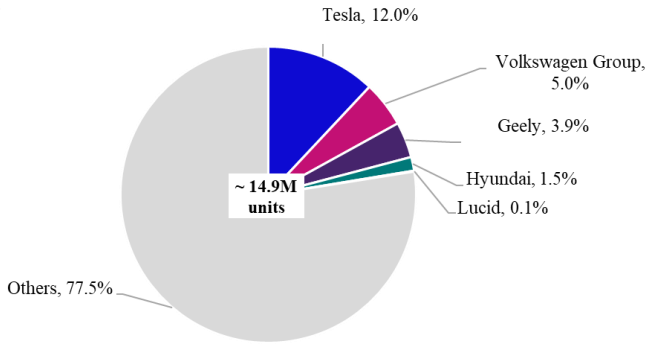
Key players in the global passenger vehicle EV market include Tesla, Volkswagen, Geely & Hyundai, forming a collective market share of approximately 22%

The global EV market is still at a relatively nascent yet fast-evolving stage, with leadership concentrated among a few global giants while a large number of emerging players steadily expand their footprint.

In Calendar Year 2024, Tesla remained the clear leader with approximately 12% share, supported by its global scale, first-mover advantage & strong technology positioning. BYD followed as the second-largest player in the same period. Established automakers like Volkswagen Group (approximately 5%), Geely (approximately 3.9%) & Hyundai (approximately 1.5%) also consolidated presence across key regions through diversified product portfolios & regional market plays.

At the same time, other players accounted for approximately 77.6% of the market, reflecting the growing influence of newer entrants & regional OEMs, particularly in China & Europe. These companies, while individually holding smaller shares, are collectively shaping the competitive intensity by addressing localised demand, offering affordable EV options & benefiting from strong policy support.

Key players in the global passenger EV market - By sales volume
(%, CY24)

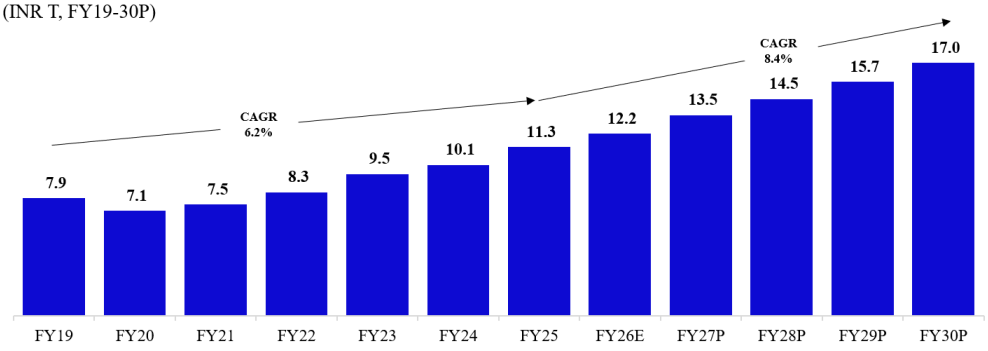


Source(s): Company websites, 1Lattice analysis

Indian automotive market is projected to grow from approximately ₹ 11.3 trillion in Fiscal 2025 to approximately ₹ 17.0 trillion in Fiscal 2030

The Indian automotive market expanded from approximately ₹ 7.9 trillion in Fiscal 2019 to approximately ₹ 11.3 trillion in Fiscal 2025, recording a CAGR of approximately 6.2% driven by rising consumer incomes, better road infrastructure & post-COVID demand recovery. By Fiscal 2030, the market is expected to reach approximately ₹ 17.0 trillion, reflecting a stronger CAGR of approximately 8.4% over Fiscal 2025 to 2030, supported by robust replacement demand, electrification momentum, government incentives & sustained growth across passenger & commercial vehicles.

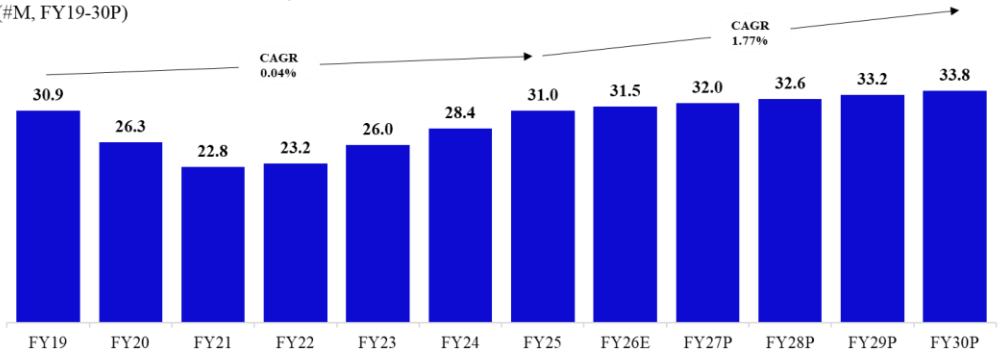
Indian automotive market - By value
(INR T, FY19-30P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

In terms of volume, the Indian automotive market remained relatively flat, with approximately 30.9 million units in Fiscal 2019 to approximately 31.0 million units in Fiscal 2025, reflecting a CAGR of approximately 0.04%, this was primarily due to pandemic induced dip in sales with demand rebounding in Fiscal 2023. Looking ahead, volumes are expected to rise to approximately 33.8 million units by Fiscal 2030, translating into a modest CAGR of approximately 1.8% over Fiscal 2025 to 2030, supported by steady demand recovery, electrification trends & rising replacement cycles.

Indian automotive market - By sales volume
(#M, FY19-30P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

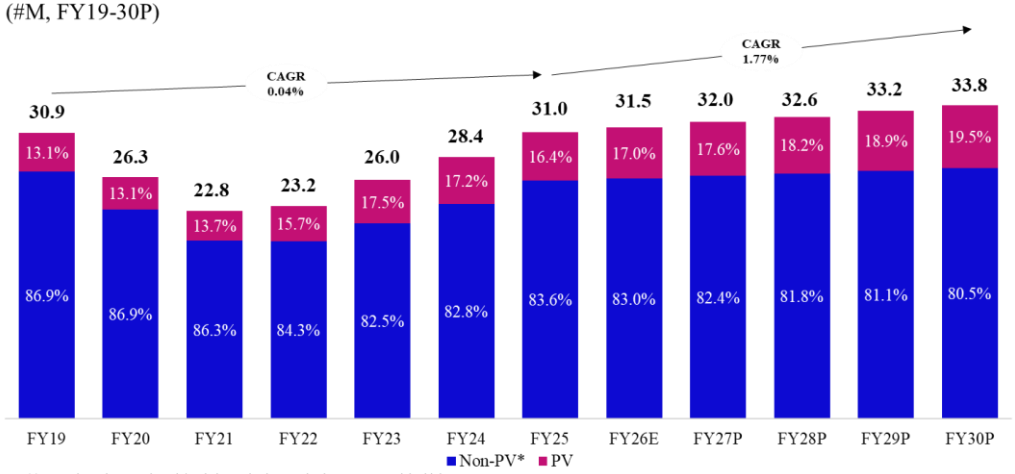
Passenger vehicles share expected to rise from approximately 16.4% in Fiscal 2025 to approximately 19.5% by Fiscal 2030

The Indian automotive market is dominated by non-passenger vehicles (two wheelers, three wheelers and commercial vehicles), holding approximately 86.9% share in Fiscal 2019. Passenger vehicles followed with approximately 13.1% share.

By Fiscal 2025, non-passenger vehicles remained the largest segment at approximately 83.6%, though passenger vehicles improved to approximately 16.4%, driven by rising urbanisation, disposable incomes & personal mobility preferences.

Looking ahead, non-passenger vehicles are expected to moderate to approximately8 0.5% by Fiscal 2030, as passenger vehicles rise to approximately 19.5% on the back of premiumisation, EV adoption & expanding middle-class aspirations.

Segmentation of Indian automotive market - By vehicle category
(#M, FY19-30P)

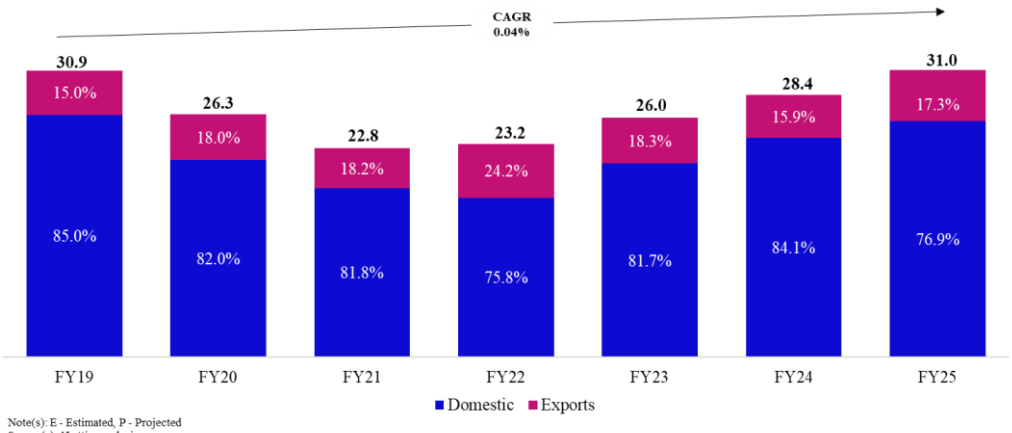


Note(s): E - Estimated, P – Projected, *Includes 2-wheelers, 3-wheelers & commercial vehicles
Source(s): 1Lattice analysis

By domestic and export segments, the Indian automotive market has historically been dominated by domestic sales, which accounted for approximately 85% of total sales in Fiscal 2019. This strong domestic share is driven by robust internal demand, rising vehicle ownership, and expanding urban mobility. However, by Fiscal 2025, the domestic share is projected to decline to approximately 76.9%, reflecting the growing contribution of exports.

Exports have gradually risen from approximately 15% in Fiscal 2019 to approximately 17.3% in Fiscal 2025, driven by the growing competitiveness of Indian manufacturers, adherence to global quality standards & integration into international supply chains. Initiatives such as “Make in India, make for the world” have further strengthened the export ecosystem, enabling manufacturers to meet both OEM & aftermarket demand in global markets.

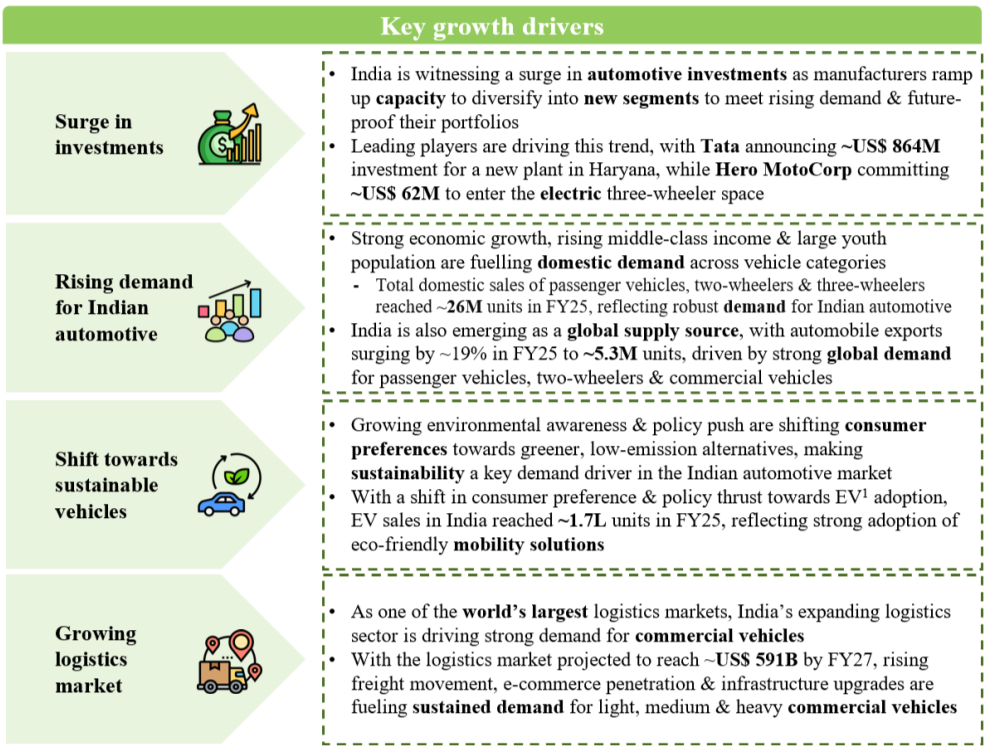
Segmentation of Indian automotive market - By domestic & exports
(#M, FY19-30P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

Rising investments, growing demand, sustainable mobility shift & expansion in logistics drive the Indian automotive market

India’s automotive industry is gaining strong momentum, supported by rising domestic demand, increasing investments & supportive policy reforms. The rapid expansion of logistics and a growing transition toward sustainable mobility are further shaping the sector’s long-term growth trajectory.



Note(s): [1]Electric vehicle

Government policies including PLI scheme, scrappage policy, FAME incentives & localisation mandates are bolstering India's automotive industry

The Government of India has rolled out multiple strategic initiatives to accelerate growth & transformation in the automotive sector. Key policies including the production linked incentive (PLI) scheme, vehicle scrappage policy, Faster Adoption & Manufacturing of Hybrid & Electric Vehicles (FAME) incentives & localisation mandates, are aimed at strengthening domestic manufacturing, promoting clean mobility, attracting investments & enhancing global competitiveness.

- **PLI scheme:** Launched with a budgetary outlay of approximately USD 3.1 billion to boost the manufacturing of advanced automotive technology products in India. It promotes deep localisation & supports the development of domestic & global supply chains, helping strengthen India's position as a competitive hub for advanced automotive manufacturing

- **Scrappage policy:** Designed to phase out old, unfit & polluting vehicles through a nationwide ecosystem of Registered Vehicle Scrapping Facilities (RVSFs) & Automated Testing Stations (ATSs). With over 60 RVSFs & 75 ATSs already operational across multiple states, the policy supports cleaner mobility & boosts demand for new vehicles, thereby creating a positive ripple effect across the automotive value chain

- **FAME incentives:** Provides upfront incentives on electric vehicle purchases, making EVs more affordable & accelerating its adoption. Incentives are linked to battery capacity with approximately ₹ 10 thousand per KWh for electric 3-wheelers & 4-wheelers and approximately ₹ 15 thousand per KWh for electric 2-wheelers. By reducing the effective cost for consumers, the scheme supports EV penetration & drives demand in India's growing electric mobility segment

- **Localisation mandates:** To promote 'Make in India' & strengthen domestic manufacturing, government procurement norms now prioritise vehicles & components made locally. Under the PLI Auto scheme, beneficiaries must meet a minimum of 50% domestic value addition (DVA) to qualify for incentives. This push toward localisation has driven significant investment and job creation, reinforcing India's self-reliance in the automotive supply chain

- **UK-India FTA:** A historic bilateral trade deal between India & UK, designed to strengthen economic ties with India. For the automotive sector, it eliminates duties on approximately 99% of Indian exports, creating new opportunities for auto parts & engine suppliers. By improving market access & reducing trade barriers,

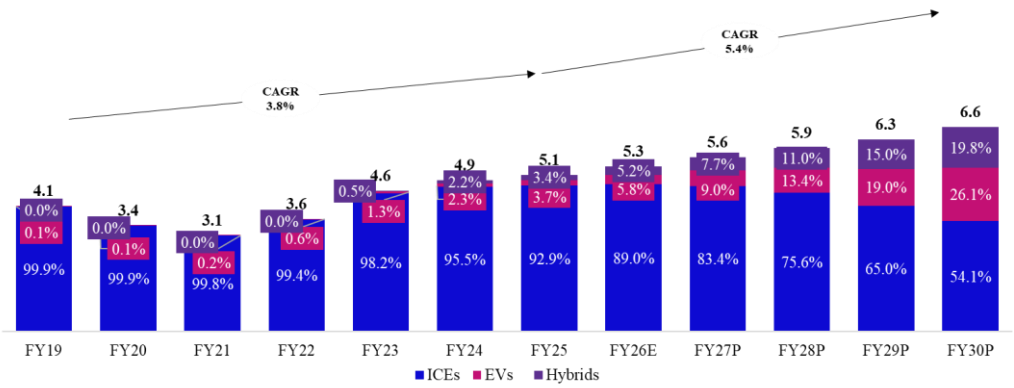
the agreement boosts India's export competitiveness while supporting collaboration on advanced technology, clean mobility & sustainable automotive manufacturing.

Indian passenger vehicle market is segmented into ICEs, EVs & hybrids, EVs' and hybrids' shares expected to climb from approximately 3.7% & approximately 3.4% respectively in Fiscal 2025 to approximately 26.1% & approximately 19.8% respectively by Fiscal 2030

The Indian passenger vehicle market is segmented into ICEs, EVs & hybrids. In Fiscal 2019, ICEs dominated with approximately 99.9% share, while EVs (approximately 0.1%) & hybrids (approximately 0.0%) were negligible. By Fiscal 2025, ICEs retained the majority at approximately 92.9%, but EVs (approximately 3.7%) & hybrids (approximately 3.4%) gained traction. Looking ahead to Fiscal 2030, ICE share is expected to fall to approximately 54.1%, while EVs (approximately 26.1%) & hybrids (approximately 19.8%) together approach half the market, signalling a structural transition driven by incentives, rising fuel costs & consumer preference for sustainable mobility.

Passenger EV sales in India are set to grow rapidly, rising from 3.7% of total passenger vehicles in Fiscal 2025 to 26.1% by Fiscal 2030. This translates to an increase in units sold from approximately 0.19 million vehicles in Fiscal 2025 to approximately 1.7 million vehicles in Fiscal 2030. Over this period, the volume of passenger EVs is expected to expand at a robust CAGR of approximately 56.0%, reflecting accelerating adoption and a strong shift towards electric mobility in the country.

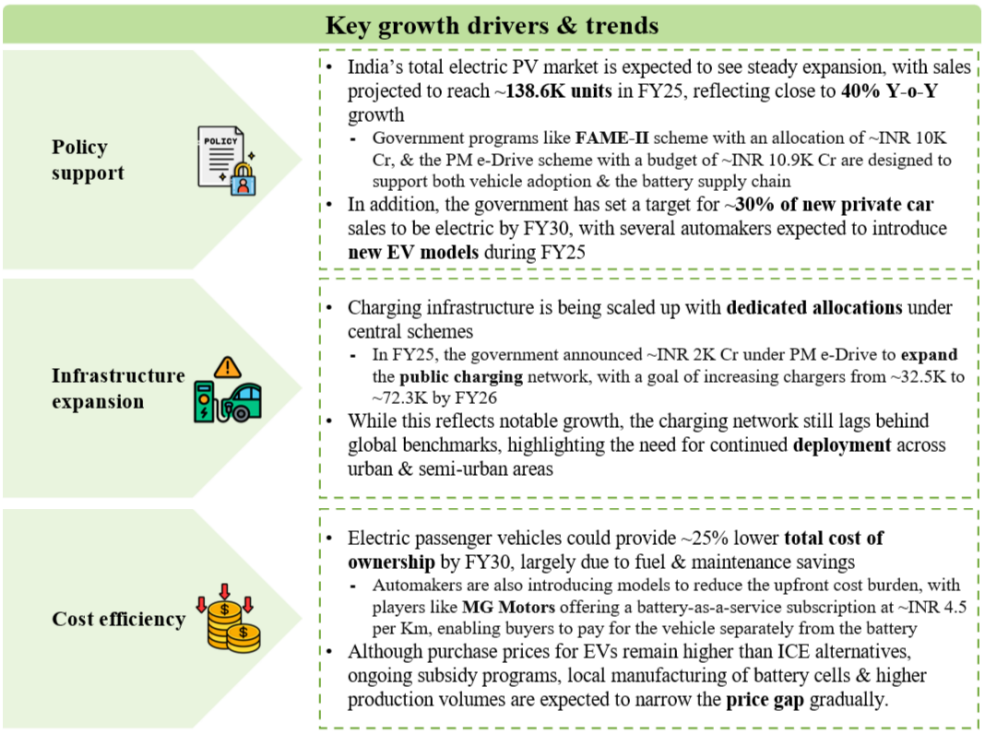
Segmentation of Indian passenger vehicle market - By powertrain mix
(#M*, FY19-30P)



Note(s): E - Estimated, P – Projected, *Sales volume
Source(s): 1Lattice analysis

Supportive government policies, expansion of infrastructure, & cost efficiency serve as the key drivers & trends of EV penetration in the passenger vehicle segment in India

The rapid penetration of electric vehicles in the India is being supported by the following drivers:



Total cost of ownership (TCO) analysis of 4W ICE vs EV passenger vehicle over 5 years

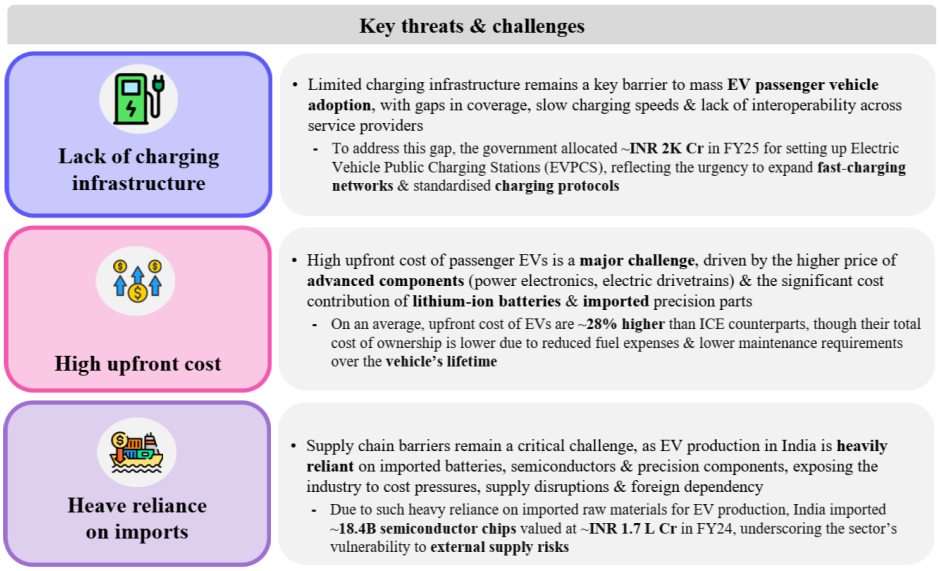
The total cost of ownership (TCO) analysis highlights that while EVs have a higher upfront purchase price compared to ICE vehicles (approximately ₹ 16 lakhs vs approximately ₹ 12.5 lakhs), their overall ownership cost is significantly lower. This advantage arises from fewer moving parts, reduced running costs & lower maintenance expenses. Consequently, EVs achieve a 5-year TCO of approximately ₹ 8.3 lakhs, nearly 25% lower than ICE vehicles at approximately ₹ 11.1 lakhs, underscoring the long-term economic viability of EV adoption despite the initial cost barrier.

TCO analysis for 4W ICE vs EV passenger cars (5-year period)			
4W passenger car	**Unit**	**ICE**	**EV**
Retail price	INR	~12,50,000	~16,00,000
Rate of depreciation for 5 years	%	~60%	~50%
Residual price after 5 years	INR	~5,01,000	~7,90,000
Mileage	Km/L or Km/kW	~21.5 Km/L	~43.1 Km/kW
Annual running distance	Km	~12,500	~12,500
Annual fuel / electricity consumption	L / kW	581.4	290.2
Fuel / electricity cost per Km	INR	~100.5	~9.8
Running cost over 5 years	INR	~2,92,000	~14,100
Cost of maintenance & service over 5 years	INR	~65,000	~31,300
TCO	**INR**	**~11,09,000**	**~8,33,600**

Note(s): Retail price is calculated as an average of ex-showroom prices of different 4W passenger vehicles models

Inadequate charging infrastructure, high upfront costs & heavy import dependence remain the key bottlenecks constraining growth in the Indian passenger EV market

Despite strong policy support & growing consumer interest, the Indian passenger EV market continues to face several structural challenges that could hinder large-scale adoption. Key concerns include the high upfront cost of EVs driven by expensive batteries & precision components, inadequate charging infrastructure with limited fast-charging coverage & deep reliance on imported raw materials & electronic parts. Addressing these bottlenecks will be critical to ensuring sustained, inclusive EV growth in the country.

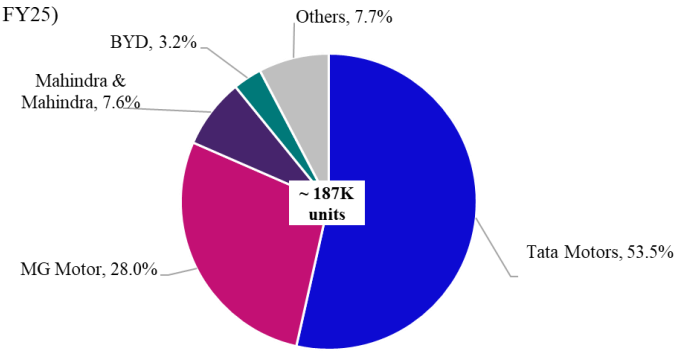


Key players in the Indian passenger EV market include Tata Motors, MG Motor, Mahindra & BYD, collectively forming a market share of approximately 92%

The Indian passenger EV market is undergoing rapid consolidation, with a few leading players capturing the bulk of demand. The segment has seen strong momentum driven by government incentives, evolving customer preferences & widening product portfolios. Tata Motors has retained clear leadership, leveraging its early-mover advantage, wide product range & strong distribution network. MG Motor has swiftly ramped up its presence by targeting the urban consumer base with feature-rich models, while Mahindra & Mahindra has strengthened its position in the SUV EV segment. Global entrant BYD is gradually scaling up operations, reflecting a growing share in the market.

In Fiscal 2025, Tata Motors dominated with approximately 53.5% share, followed by MG Motor at approximately 28%. Mahindra & Mahindra holds approximately 7.6%, while BYD accounts for approximately 3.2%. The remaining approximately 7.7% is distributed among smaller OEMs & niche players. This distribution highlights a market where leadership is concentrated among a few, but competitive intensity is steadily increasing.

Key players in the Indian passenger EV market - By sales volume
(%, FY25)



Source(s): Company websites, 1Lattice analysis

Auto components market - Industry overview

The automotive & off-highway component industry comprises a broad spectrum of parts, including engines, transmissions, suspensions, braking systems, electrical & electronic modules, drivetrains, and EV-specific technologies. These components serve passenger vehicles, commercial vehicles, two-wheelers & other off-highway machinery such as tractors, harvesters & construction equipment.

The industry has evolved steadily, driven by rising vehicle production, technological innovation & a shift toward electrification. OEMs & tier-1 suppliers are increasingly investing in advanced powertrains, battery systems, thermal management & lightweight materials to meet stricter emission, safety & efficiency standards.

Changing mobility trends & the adoption of electric and hybrid vehicles are reshaping demand patterns, creating growth opportunities for specialised components. At the same time, global supply chains are realigning, with suppliers diversifying production bases, strengthening resilience & forming strategic partnerships to enhance competitiveness.

Overall, the industry is undergoing a structural transformation, marked by innovation, electrification & smart manufacturing. Suppliers capable of delivering high-precision, technologically advanced components are poised to capture long-term growth opportunities across both conventional & emerging vehicle platforms.

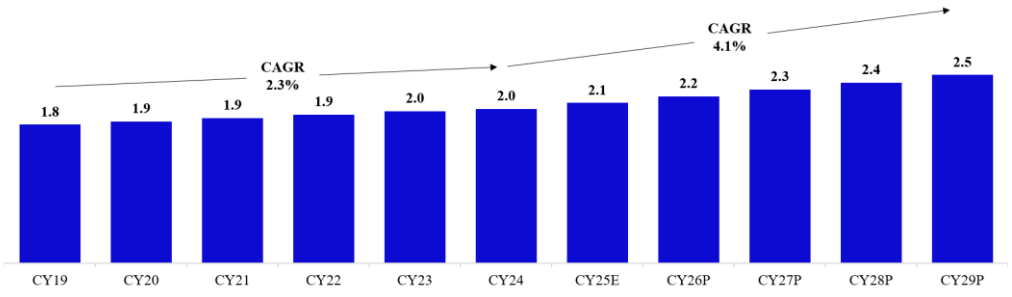
Global auto & off-highway components market is projected to grow from approximately USD 2.0 trillion in Calendar Year 2024 to approximately USD 2.5 trillion by Calendar Year 2029

Between Calendar Year 2019 and Calendar Year 2024, the global auto & off-highway components market grew moderately, rising from approximately USD 1.8 trillion in Calendar Year 2019 to approximately USD 2.0 trillion in Calendar Year 2024 at a CAGR of approximately 2.3%. This period reflected a gradual recovery from the COVID-19 pandemic, which had initially disrupted supply chains and dampened demand. As economies reopened, vehicle production rebounded, driving demand for both conventional and advanced components.

A notable shift toward electrification also emerged, with OEMs and Tier-1 suppliers diversifying their portfolios to support electric & hybrid platforms, particularly in battery systems, electric drivetrains, and thermal management. Looking ahead, the market is projected to expand more rapidly, from approximately USD 2.0 trillion in Calendar Year 2024 to approximately USD 2.5 trillion in Calendar Year 2029, reflecting a CAGR of approximately 4.1% and driven by structural changes in mobility and manufacturing.

Accelerated EV adoption across developed & emerging markets is expected to boost demand for specialised components such as electric drive systems, battery modules, and software integration. At the same time, large-scale investments in infrastructure & mining, particularly in North America and Asia Pacific, are fuelling demand for off-highway equipment and related components. Global supply chains are also realigning as companies diversify sourcing and production bases to enhance resilience, a shift that is encouraging regional manufacturing and strengthening localised component suppliers.

Global auto and off highway component market - By value
(US$ T, CY19-30P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

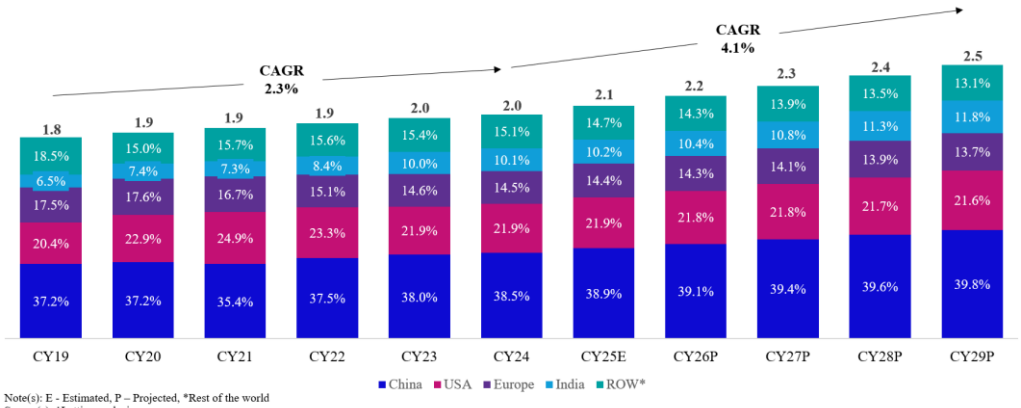
Regionally, China led the market with an approximately 37 to 38% share during Calendar Year 2019 to 2024, supported by its strong automotive manufacturing base, cost-efficient supply chain & dominance in EV & battery ecosystems. The USA followed with an approximately 20 to 22% share, driven by large domestic demand, high aftermarket potential & advanced technology adoption. Europe accounted for approximately 17% in Calendar Year 2019 but declined to approximately 14% by Calendar Year 2024, as stricter emission norms, rising energy

costs & supply disruptions pressured OEM production & sourcing.

India's share rose from approximately 6% in Calendar Year 2019 to approximately 10% in Calendar Year 2024, benefiting from cost competitiveness, the localisation pushes under Make in India & rising exports to OEMs in the US & Europe. The ROW, comprising Japan, South Korea, ASEAN, Latin America & Africa, fell from approximately 18% in Calendar Year 2019 to approximately 15% in Calendar Year 2024, reflecting slower demand growth, heavy import reliance, and supply chain shifts toward India & China.

Looking ahead, China is expected to maintain dominance at a stagnant approximately 39 to 40% by Calendar Year 2029, as growth plateaus amid capacity saturation. The USA is projected to edge up to approximately 22%, supported by sustained aftermarket demand & EV adoption. Europe is likely to decline further to approximately 13% due to structural cost pressures & the gradual shift of component sourcing to Asia. India's share is forecast to expand to approximately 12%, underpinned by export growth, supplier base expansion & rising traction in EV components. ROW is expected to moderate to approximately 13% by Calendar Year 2029, with growth in Japan, South Korea & ASEAN partly offset by weaker performance in Latin America & Africa.

Global auto & off-highway components market (value) - Split by regions
(%, CY19-29P)



Note(s): E - Estimated, P – Projected, *Rest of the world
Source(s): 1Lattice analysis

Key drivers promoting growth globally

Several key factors drive the global auto and off-highway components market:

Global auto and off-highway components growth drivers

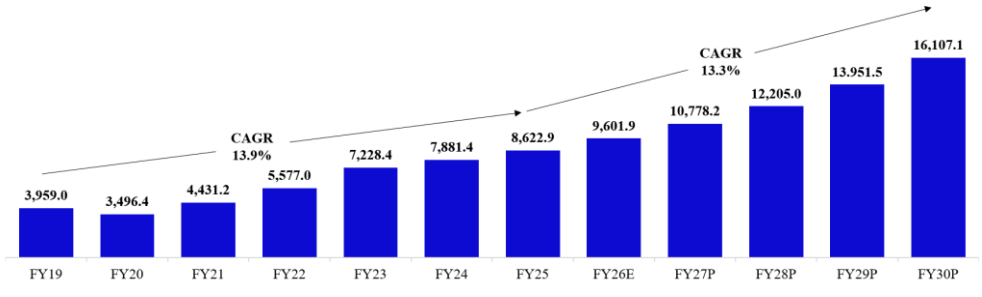
Electrification & alternative powertrains	• Rising demand for EV[1] and hybrid systems is driving innovation in powertrain, battery, and electronic components, with global EV sales reaching nearly **14M in CY23**, accounting for 18% of all new cars sold, and projected to exceed **17M in FY24** • In the U.S., electric and hybrid vehicles together represented **17.9%** of new light-duty vehicle sales in FY23, reflecting the broader shift toward electrification across vehicles.
Regulatory push for sustainability	• Governments worldwide are mandating lower emissions and promoting sustainability, which incentivizes OEMs[2] and suppliers to develop cleaner, more efficient technologies and components • Regions such as Europe and China are pursuing strong electrification goals, supported by strict emissions targets and financial incentives
Digitalization & connectivity	• Technologies such as **AI[3]-driven manufacturing**, advanced sensors, IoT[4], predictive diagnostics, and smart telematics are driving demand for smart components, enabling remote diagnostics and real-time equipment monitoring. add the data here with quant
Rising demand & aftermarket growth	• Expanding vehicle fleets drive global aftermarket demand for replacement parts, components, **and upgrades, both on-road and off-highway** • Ageing fleets, increased vehicle/machine usage, and premiumization of replacement parts contribute to strong aftermarket growth

Note(s): [1]Electric vehicle, [2]Original equipment manufacturer, [3]Artificial intelligence, [4]Internet of things

India auto & off-highway components market is expected to grow from approximately ₹ 8,662.9 billion in Fiscal 2025 to approximately ₹ 16,107.1 billion by Fiscal 2030

The Indian auto & off-highway components market (in terms of sales) witnessed a strong recovery from the disruptions caused by the COVID-19 pandemic, expanding from approximately ₹ 3,959.0 billion in Fiscal 2019 to approximately ₹ 8,622.9 billion in Fiscal 2025 at a CAGR of approximately 13.9%. Looking ahead, the market is projected to grow further, reaching approximately ₹ 16,107.1 billion by Fiscal 2030 at a CAGR of approximately 13.3%.

India auto and off highway component market (value)
(INR B, FY19-30P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

The market is witnessing growth, driven by a confluence of global & domestic factors.

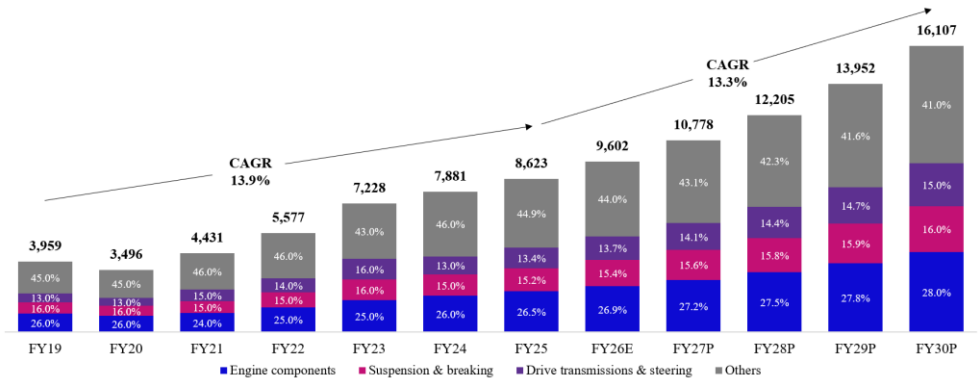
- On the global front, the shift toward a China+1 strategy has encouraged multinational companies to increasingly source from India to diversify risks. Simultaneously, OEMs are localising supply chains to reduce costs and meet regulatory norms, boosting demand for domestically manufactured components. India's skilled workforce, cost competitiveness, and expanding R&D capabilities are reinforcing its position as a global hub for precision manufacturing.

- On the domestic front, the revival of economic activity has fuelled strong internal demand, while rising exports signal the improved competitiveness of Indian suppliers in international markets. Enhanced infrastructure and higher capital expenditure have further accelerated industry momentum. Additionally, government initiatives such as the PLI scheme are incentivising manufacturing investments, resulting in a surge in component production.

India auto and off-highway components market by component type

Between Fiscal 2019 and Fiscal 2025, engine components dominated the market, accounting for 26.5% of the total value in Fiscal 2025, respectively. Suspension & breaking components also held a sizeable share, reflecting their continued relevance across both ICE & electrified platforms. Notably, engine component manufacturing remains technology & capital intensive, creating high entry barriers, particularly for smaller players & the unorganised segment.

Indian auto and off-highway components market (value) - Split by component type
(INR B, FY19-30P)



Note(s): E - Estimated, P – Projected, Others include body & chassis, electrical & electronics, cooling systems, etc.
Source(s): 1Lattice analysis

India auto & off-highway components market by supply type

OEM supply accounted for the majority share at approximately 66.1% in Fiscal 2025. Key OEMs, having >20% share in retail market segments include (for Fiscal 2025 as per FADA data):

- **Two-wheeler OEMs:** Hero MotoCorp Ltd. (28.8%s) & Honda Motorcycle and Scooter India (P) Ltd. (25.4%)
    - **EV:** Ola Electric Technologies Pvt. Ltd. (29.9%), TVS Motor Company Ltd. (20.7%), & Bajaj Auto Ltd. (20.1%)
- **Passenger vehicle OEMs:** Maruti Suzuki (40.2%)
    - **EV:** Tata Motors Passenger Vehicles Ltd. (53.5%) & MG Motor India Pvt. Ltd. (28.0%)
- **Tractor OEMs:** Mahindra and Mahindra Ltd. (23.6%)
- **Commercial vehicle OEMs:** Tata Motors Ltd. (33.5%) & Mahindra & Mahindra Ltd. (25.5%)
    - **EV:** Tata Motors Ltd. (48.5%)

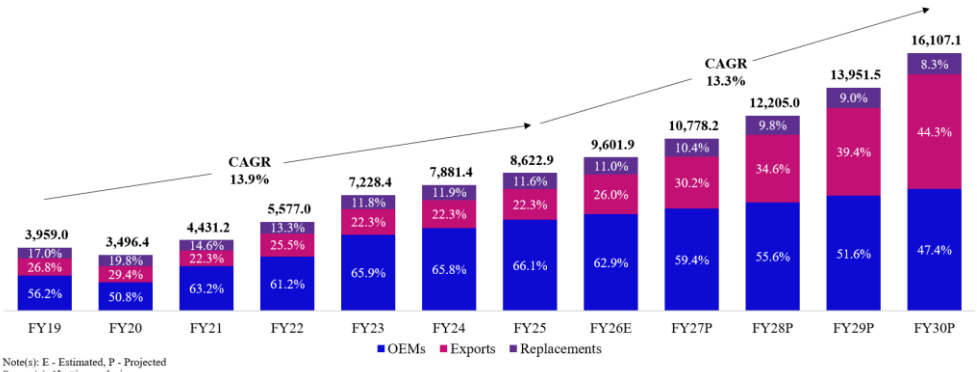
Replacement (aftermarket) and exports contributed 22.3% and 11.6% in Fiscal 2025 respectively. Between Fiscal 2025 and Fiscal 2030, exports and replacement segments are expected to outpace OEM growth, supported by ageing vehicle fleets and diversification of global sourcing, even as OEM demand continues to anchor overall volumes.

Within the components mix, engine components currently contribute the largest share, followed by suspension and braking systems. However, the next wave of growth is likely to be led by advanced powertrain technologies, lightweight materials, and EV-specific components, reflecting the industry's transition toward electrification as well as stricter emission and safety norms.

India's major export markets for auto components include the United States, Europe (notably Germany, the UK, France, and Italy) & the Asia-Pacific region. The country holds a competitive edge due to its cost-efficient manufacturing base, a large skilled and semi-skilled workforce, robust policy support under initiatives like Make in India and the Production Linked Incentive (PLI) scheme, and a rapidly modernising ecosystem aligned with Industry 5.0.

These advantages, combined with India's strategic geographic proximity to key automotive markets and its position as the world's second-largest steel producer, allow it to deliver quality components at significantly lower costs compared to Europe and Latin America. As a result, the Indian auto components market is poised for strong growth, with exports projected to reach approximately ₹ 7,135 billion (USD 100 billion) by Calendar Year 2030, driven by rising demand, sustained innovation, and favourable trade policies.

Indian auto and off-highway components market (value) - Split by supply type
(INR B, FY19-30P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

Industrial partnerships & deals overview: In the Indian off-highway market, major OEMs have entered into significant partnerships to strengthen technology adoption and localisation.

- **ZF Group:** Secured a multi-year contract with a major commercial vehicle OEM to supply AxTrax 2 electric axles and transmission systems for medium-duty buses and heavy trucks, advancing electrification in the sector.

- **DEUTZ & TAFE Motors:** Entered into a strategic partnership to manufacture up to 30 thousand engines annually in India, aiming to serve both domestic and Asia-Pacific (APAC) markets.

- **Balkrishna Industries Ltd. (BKT):** Announced a ₹ 3,500 crore investment as part of a five-year strategy to expand manufacturing and upgrade technology for its agricultural, mining, industrial, and construction tyres.

India's auto and off-highway component exports are steadily rising, with a diversified global footprint and growing demand across key markets

India's auto and off-highway component exports are steadily rising as the country strengthens its position as a cost-competitive and reliable alternative to China in global supply chains. Drive transmission and steering components form a major share of Indian exports, contributing nearly 1/3rd of overall Indian exports in Fiscal 2024.

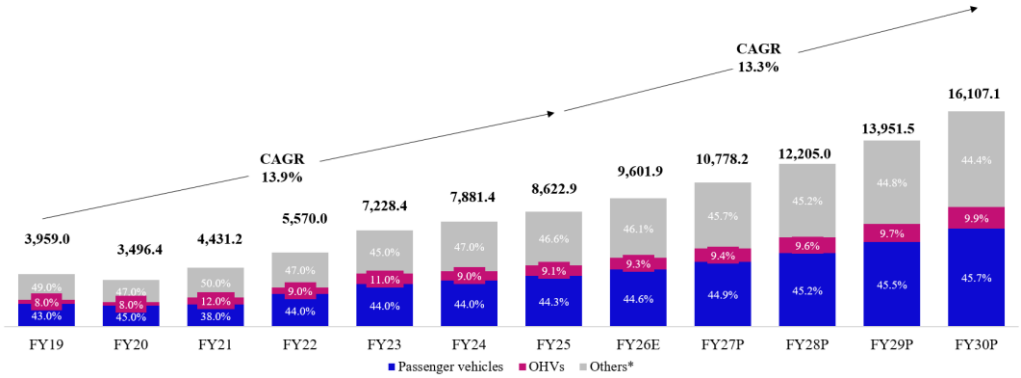
In Fiscal 2025, the U.S. accounted for the largest market with approximately 32% of exports, followed by Europe accounting for 29.5%, and Asia accounting for 26%. In Fiscal 2024, the U.S. was the largest market with approximately 27% share, supported by its vast OEM base, strong aftermarket demand, and active supply-chain diversification away from China. Germany followed with approximately 8%, leveraging India's engineering depth to support its advanced automotive hubs, while Turkey (approximately 5%) emerged as a strategic re-export hub for Europe and West Asia.

The UK, Thailand & Italy contributed approximately 3% each, reflecting stable aftermarket demand. Southeast Asia is also becoming a key growth opportunity, with regional manufacturing expansion driving demand for Indian components. The remaining approximately 51% share was distributed across other regions, highlighting India's diversified export footprint, underpinned by quality, scale, and policy support.

India auto and off-highway components market by vehicle segments

In Fiscal 2025, component demand closely reflected vehicle production patterns, with passenger vehicles (PVs) accounting for approximately 44.3% and off-highway vehicles (OHVs) at approximately 9.1%, tractors specifically contributed approximately 7.2%. Between Fiscal 2025 and Fiscal 2030, share of passenger vehicles (PVs) is expected to rise to approximately 45.7%. At the same time, demand from OHVs is also likely to accelerate.

Indian auto and off-highway components market - Split by vehicle segments
(INR B, FY19-30P)



Note(s): E - Estimated, P - Projected, *includes two-wheelers, three-wheelers & commercial vehicles
Source(s): 1Lattice analysis

Key drivers & trends promoting growth in India

India's auto & off-highway components market is being propelled by a combination of rising domestic demand, deeper integration into global supply chains, and sustained government support. These factors, together with cost competitiveness and a strong localisation push, are positioning India as a critical hub for automotive and off-highway component manufacturing.

Key growth drivers & trends	
Increasing vehicle production & demand	• Vehicle ownership in India is rising due to higher disposable incomes, urbanisation, and a preference for personal mobility, boosting demand for automotive components • Growth in passenger cars, commercial vehicles, and especially electric vehicles is expanding the scale and diversity of component requirements
Regulatory & policy support	• Policies like the PLI[1] scheme incentivise domestic manufacturing, focus on advanced technological capabilities, and promote component localisation • Regulatory emphasis on safety and ADAS[2] increases demand for related high-tech components such as sensors and cameras
Localization & cost competitiveness	• OEMs[3] and Tier-1 suppliers are investing in local production of advanced components (e.g., EV[4] motors, automatic transmissions, axles, etc.) to reduce import dependence • Companies like Bosch and Tata AutoComp Systems are working to increase local manufacturing, reducing reliance on imports and enabling cost advantages
Technological advancements & innovation	• Demand for advanced safety & transmission systems is driving innovation in component design and production, leading to more sophisticated and connected parts • Adoption of lightweight materials (like aluminum and composites) improves vehicle fuel efficiency and is required to meet stringent emission regulations

Note(s): [1]Production Linked Incentive, [2]Advanced driver-assistance systems, [3]Original Equipment Manufacturer, [4]Electric Vehicle

Key entry barriers in the Indian component market

The Indian precision components market is characterised by high entry barriers that limit the participation of new players. Stringent product approval cycles, mandated certifications, complex customer acquisition processes & the need for strong technical expertise create significant hurdles. In addition, integrated supply-chain management, supported by advanced manufacturing infrastructure, further strengthens the position of incumbents, making it challenging for new entrants to match the scale, quality & compliance standards required by OEMs & Tier-1

suppliers.

Note(s): [1]Automotive Research Association of India, [2]Automotive Industry Standards, [3]International Automotive Task Force, [4]Intenrational Organization for Standardization, [5]Original equipment manufacturer, [6]Request for quotation, [7]Computer numerical control

Different types of geared components are used in EV drivetrains to manage torque, control speed & optimise overall drivetrain efficiency

Electric vehicles employ a variety of geared components that enable smooth power transmission from the motor to the wheels. These gears are essential for managing torque delivery, regulating motor speed, and enhancing drivetrain performance, while also improving overall efficiency & optimising space within the vehicle design.

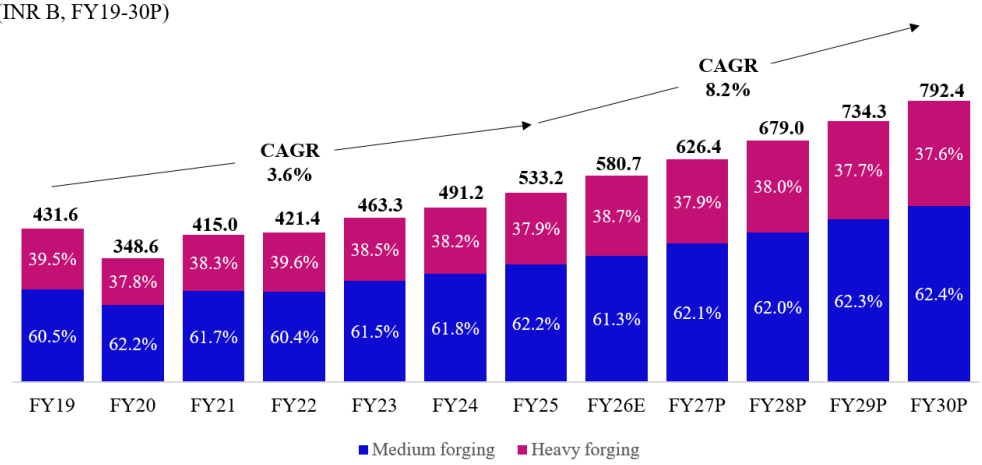
Types of geared components

Geared component	Placement	Function
 Precision planetary gears	Inside transmission unit or e-axle	• Enables compact torque conversion & speed reduction
 Reduction gears	Between electric motor & axle	• Reduced motor speed & increases torque to wheels
 Integrated e-axles	Mounted at front, rear or both axles	• Combines motor, gears & differential for efficient drive
 Differential gears	Within the e-axle or rear housing	• Distributes torque between left & right wheels during turns
 Bevel gears	At the shifting point of torque direction	• Transfers torque between intersecting shafts
 Spur gears	Within reduction gear stage	• Transfers motion between parallel shafts
 Helical gears	Inside multi-stage transmission units	• Delivers smooth & quiet power transmission
 Internal gears	Around planet gears in transmission	• Enables compact torque delivery as a planetary set
 Spiral bevel gears	At rear axle or e-axle assemblies	• Provides angled torque transfer with smooth motion

Indian forging components market is projected to grow approximately ₹ 533.2 billion in Fiscal 2025 to approximately ₹ 792.4 billion by Fiscal 2030

The Indian forging market (domestic) expanded from approximately ₹ 431.6 billion in Fiscal 2019 to approximately ₹ 533.2 billion in Fiscal 2025, registering a CAGR of approximately 3.6%. Growth is projected to accelerate, with the market expected to reach approximately ₹ 792.4 billion by Fiscal 2030 at a CAGR of approximately 8.2%. This reflects a strong demand revival, driven by rising automotive production, localisation efforts under government schemes & growing export momentum, positioning forging as a critical backbone for both domestic manufacturing & global supply chains. Beyond cyclical growth, the sector is also benefiting from India's transition toward value-added engineering, with forgings gaining prominence in high-precision applications across EVs, automobiles, off-highway vehicles, railways, etc., enhancing its long-term strategic relevance.

Indian forging market - By medium & heavy forging
(INR B, FY19-30P)



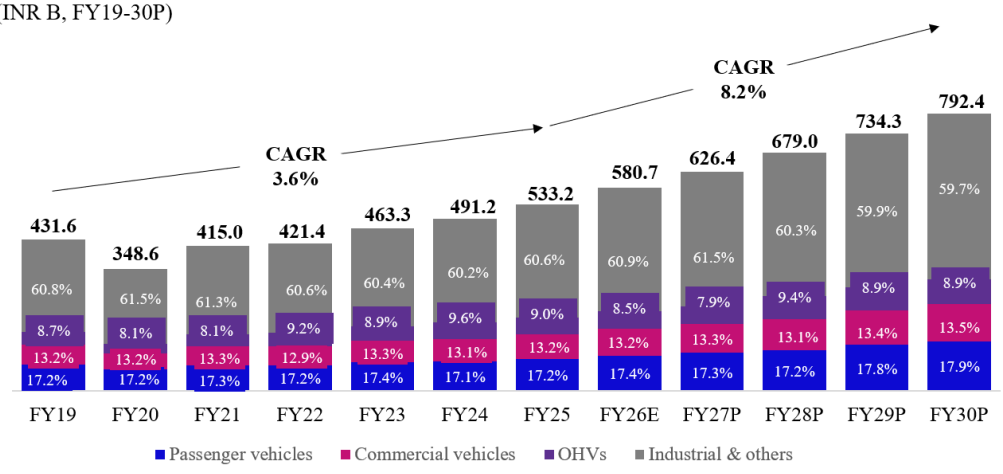
Note(s): P - Projected, E – Estimated
Source(s): 1Lattice analysis

Of the overall forging market, medium forging accounted for approximately 60% during Fiscal 2019 to 2025, with heavy forging making up the remaining approximately 40%. Looking ahead, the share of medium forging is expected to rise slightly to approximately 62%, supported by sustained growth in EVs, two-wheelers & light commercial vehicles. In contrast, heavy forging demand, largely tied to capital goods, oil & gas & power sectors, are expected to remain stable at approximately 39%, constrained by slower project cycles & import competition.

Indian forging components market by vehicle type

Between Fiscal 2019 to Fiscal 2025, industrial vehicles & passenger vehicles accounted for the bulk of forged component demand, holding approximately 60.6% & 17.2% share in Fiscal 2025, respectively, while CVs contributed approximately1 3.2%. From Fiscal 2025 to Fiscal 2030, industrial & passenger vehicles are expected to remain dominant, supported by infrastructure development & rising use of daily transport vehicles, sustaining demand for robust forged parts such as internal ring gears, bull gears, rock shafts & transmission components.

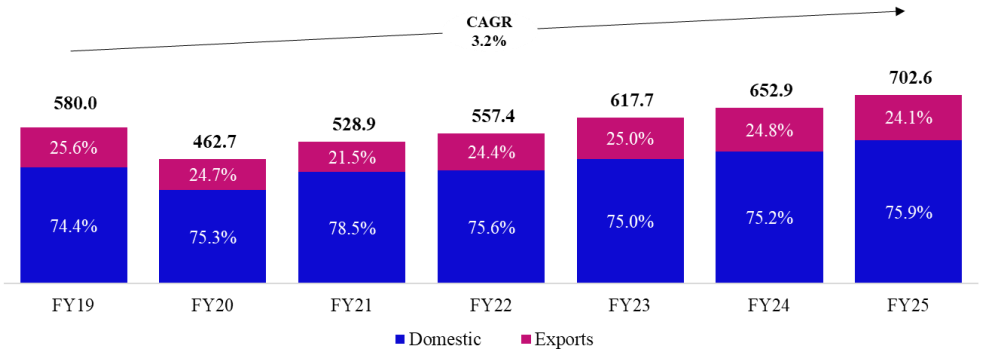
Indian forging market - By vehicle type
(INR B, FY19-30P)



Note(s): P - Projected, E – Estimated, Industrial & others include 2-wheelers, 3-wheelers & other industrial vehicles
Source(s): 1Lattice analysis

Exports have consistently made up nearly one-fourth of Indian forging market, highlighting high competitiveness and capability to supply to global OEMs

Segmentation of Indian forging market - By domestic & exports
(INR B, FY19-25)



Note(s): P - Projected, E - Estimated
Source(s): 1Lattice analysis

Exports in the Indian forging market have contributed 24 to 25% during Fiscal 2019 to 2025 to the Indian forging market; however, in Fiscal 2021, due to pandemic-induced economic slowdown, especially in developed economies, there was a decline in exports, bringing the share of exports to approximately 21.5%.

High share of exports in the Indian forging market displays a mature, resilient, & globally integrated forging industry. India's strong positioning in the forging industry is also supported by cheap prices for steel, which, at the end of Fiscal 2025, was 10 to 15% cheaper in India than in Europe (price comparison for hot rolled coil steel). Cost-competitiveness, along with established infrastructure, helps Indian players to cater effectively to OEMs.

Key trends & major players of the Indian forging market

Key trends:

- **Outsourcing trends:** OEMs are increasingly outsourcing forging needs to specialised suppliers. For instance, a major European automotive OEM has outsourced over 50% of its forged components globally to ensure Just in Time (JIT) delivery, cost efficiency & supply chain flexibility, enabling OEMs to lower inventory costs while focusing on core competencies.

- **Adoption of advanced materials**: The Indian forging market is increasingly adopting high-strength steel, aluminium alloys & titanium to meet the demand for durable, lightweight & fuel-efficient components. This is driven by growth in automotive, agriculture & infrastructure sectors. Integration of advanced technologies like CNC, automation & 3D printing enables precise, efficient production of complex parts, aligning with sustainability & cost-efficiency goals. Leading players such as Bharat Forge & Ramkrishna Forgings are investing in these innovations to cater to evolving needs in construction equipment, tractors & off-highway vehicles.

- **Shift towards precision forging**: Rapid industrialisation & rising demand from automotive & off-highway sectors are pushing the adoption of precision forging. By integrating CNC, automation & 3D printing, manufacturers can deliver highly accurate, lightweight yet durable components suited for EVs & high-performance applications. Companies like Bharat Forge, Milestone Gears & CIE Automotive India are scaling investments in precision forging to meet global standards, improve energy efficiency & enhance competitiveness.

- **Sustainable forging**: Growing emphasis on eco-friendly practices is driving adoption of closed-die forging, which enables high-strength, precise components with minimal waste. The method is widely used in automotive, construction & off-highway equipment. In parallel, OEMs are increasingly adopting renewable energy & advanced heat-treatment processes to reduce energy consumption, further reinforcing sustainability in the forging ecosystem.

- **Industry 4.0 integration**: The industry is rapidly deploying intelligent manufacturing, IoT-enabled sensors

& real-time analytics to boost productivity, reduce downtime & improve operational visibility.

Key growth drivers of forging components

India's forging components market is witnessing robust growth, driven by the following factors:

Note(s): [1]Electric Vehicle, [2]Computer Numerical Control, [3]Computer-Aided Design

Criticality of forged components & cost impact due to electrification

The electrification of vehicles is reshaping the forging landscape for both automotive & off-highway components. Unlike ICE vehicles, EV drivetrains require tighter tolerances, advanced materials & superior finishing to withstand higher torque loads and minimise noise in the absence of engine masking. These requirements increase costs in design, manufacturing, heat treatment & lubrication. However, EVs also provide cost offsets through reduced gear counts & simplified drivetrain architectures. The overall impact is a shift from volume-driven, standardised forgings to precision-intensive, value-added manufacturing, raising upfront component costs but delivering long-term lifecycle savings & enhanced performance benefits.

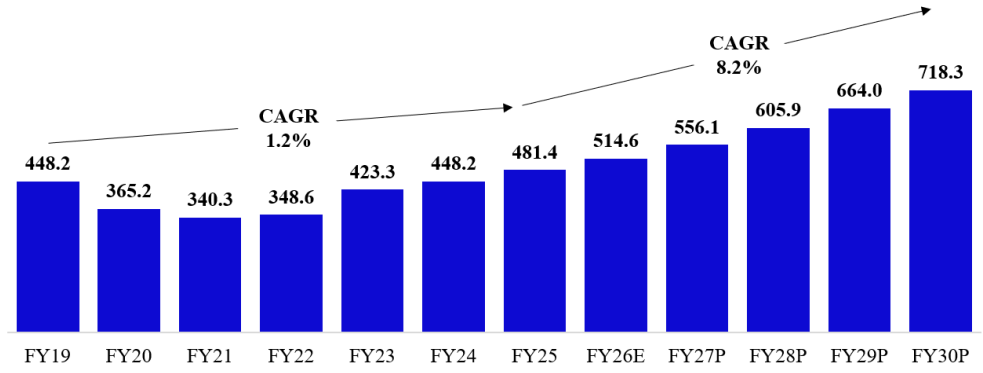
Cost impact of electrification on forged components

Parameter	Cost impact
Designing	• Design of shafts, axles & gears in EVs requires **tighter tolerances** & superior profiling, which increases costs due to advanced design tools, simulations and validation processes - Ability of shafts and axles to withstand higher and instantaneous torque loads further raises the cost of **design optimisation** compared to ICE components
Manufacturing process	• EV components require **advanced forging** presses, precision machining & additional finishing such as **honing & grinding**, which increases the overall manufacturing cost - However, reduction in the **number of gears** in EV drivetrains **lowers** the total number of forgings required, thereby partially reducing the aggregate cost per vehicle
Material	• The use of **micro-alloy steels** & **aluminium forgings** in EVs raises the cost of raw material, though it is offset by lower machining & reduced heat-treatment requirements
Size / Outer diameter	• Axles used in EVs often require a **larger diameter** to handle higher torque, which increases raw material consumption & forging costs - On the other hand, certain shafts & gears become more compact due to **simplified EV** drivetrains, **reducing** both material usage & processing costs
Lubrication	• High-speed electric motors create a need for advanced **low-viscosity lubricants**, which increases the cost of lubrication systems - However, these lubricants enhance efficiency & reduce wear, which lowers **maintenance & lifecycle costs**
Heat treatment	• EV components frequently require additional surface hardening processes such as **carburising or nitriding**, which raises processing costs - However, adoption of **micro-alloy steels** can eliminate certain heat-treatment steps, reducing both energy use & processing costs in some cases
Noise generation	• Absence of **engine noise** in EVs places greater emphasis on reducing drivetrain noise, **raising costs** for **precision finishing**, surface profiling & advanced materials - The **lower number** of gears in EV transmissions **offsets** some of this cost by reducing the overall sources of noise

Indian machining components market is projected to grow from approximately ₹ 481.4 billion in Fiscal 2025 to approximately ₹ 718.3 billion in Fiscal 2030

The Indian machining market expanded from approximately ₹ 448.2 billion in Fiscal 2019 to approximately ₹ 481.4 billion in Fiscal 2025, registering a modest CAGR of approximately 1.2%. However, growth is expected to accelerate sharply, with the market projected to reach approximately ₹ 718.3 billion by Fiscal 2030 at a CAGR of approximately 8.2%. This rebound is driven by strengthening demand from automotive & industrial sectors, rising precision engineering requirements, and a clear shift toward higher-value manufacturing, underscoring machining's growing importance in India's industrial growth story.

Indian machining market - By value
(INR B, FY19-30P)



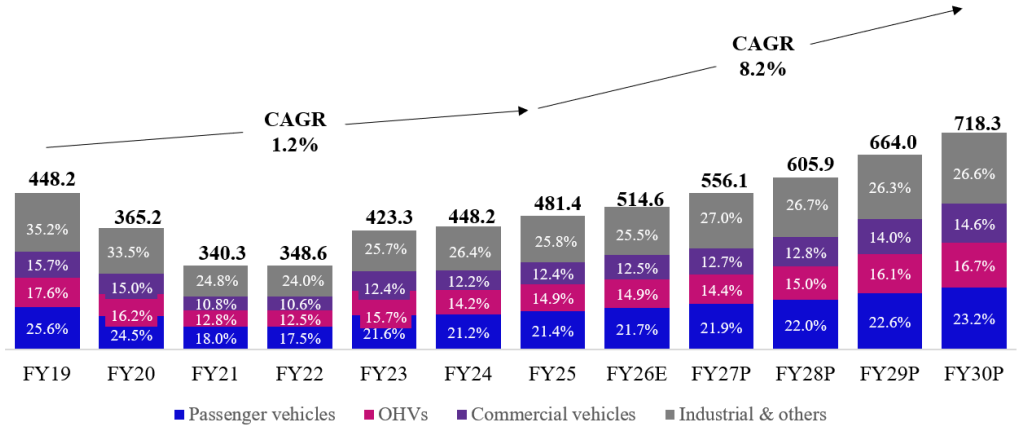
Note(s): P - Projected, E – Estimated, Global construction equipment markets consists of the following (excavators, loaders, dozers, motor graders, soil compactors, telehandlers & dump trucks)
Source(s): 1Lattice analysis

Indian machining components market by vehicle type

During Fiscal 2019 to 2025, machining components were primarily consumed by the industrial and commercial vehicle segments, which accounted for approximately 25.8% and approximately 21.4% of the market in Fiscal 2025, reflecting their complex, high-stress, and high-torque requirements. Off-highway vehicles (OHVs) contributed approximately 14.9%. Looking ahead to Fiscal 2025 to 2030, demand from industrial and commercial vehicles is expected to remain dominant, driven by the need for precision-engineered parts such as axle

components, transmission housings, and cylinder heads.

Indian machining market - By vehicle type
(INR B, FY19-30P)



Note(s): P - Projected, E - Estimated
Source(s): 1Lattice analysis

Key trends & outsourcing landscape in the Indian machining industry

Key trends

- Growing demand for precision components across automotive, aerospace, defence, electronics & general engineering is driving industry expansion.
- Rapid adoption of CNC & hybrid smart tools is enhancing precision, efficiency & cost-effectiveness in machining operations.
- Industry 4.0 technologies (AI, IoT-enabled machines, smart manufacturing) are enabling real-time monitoring, predictive maintenance & data-driven production optimisation.
- Government support through Make in India, PLI schemes & Skill Development programs is accelerating competitiveness & technology upgradation.
- Sustainability focus is promoting energy-efficient machining, eco-friendly materials & waste minimisation practices.
- Key challenges include shortage of skilled workforce for advanced CNC operations & supply chain inefficiencies due to import reliance on critical components.

Outsourcing trends & case studies in India

- Indian machining service providers are emerging as preferred outsourcing partners for global OEMs, leveraging cost advantages, skilled talent, ISO-certified quality standards & time zone benefits.
- Outsourcing enables OEMs to lower overheads, improve flexibility, shorten time-to-market & access India's growing expertise in CNC machining & assembly.

TAFE, established in 1960, is a leading Indian OEM in agricultural equipment & allied industries, with an annual revenue of approximately ₹ 14 thousand crore and a global footprint across 80+ countries. The company began as a tractor manufacturing enterprise and has since expanded into designing and producing farm machinery including tractors, agriculture implements, agriculture engines, industrial engines. The company follows a hybrid sourcing model, combining captive (in-house) production with non-captive (outsourced) supply. TMTL (TAFE Motors and Tractors Limited) operates a dedicated gears and transmissions facility in Parwanoo, Himachal Pradesh. The plant produces a wide range of gear and transmission components, which are primarily supplied for in-house use in TMTL and TAFE tractors. Key partners, including Milestone Gears, support its ecosystem, enabling scale,

flexibility & global competitiveness.

TAFE also procures a range of critical components, such as gears, shafts, axles, transmission housings, and crown wheels & pinions from several specialist suppliers to supplement its own in-house manufacturing, particularly for components that require high precision, complex machining, or specialised metallurgical processes. These suppliers, which include OEM-ancillaries and precision component manufacturers, help ensure that TAFE's tractors meet performance, quality, scalability, and cost-efficiency requirements. By combining its internal with outsourced supply, TAFE maintains flexibility in meeting design variations, volume demands and technological upgrades.

Nature of the process and complexity involved in the machining process

Machining is a specialised and demanding process that requires a blend of investment, technical skill & precision engineering. It plays a critical role across industries such as aerospace, automotive, and electronics.

To meet these requirements, modern machining increasingly depends on advanced technologies that enhance both accuracy and efficiency. Among these, scudding has gained prominence in gear manufacturing due to its ability to replicate real-world operating conditions during finishing. Scudding technology is a German patented technology and is an upgrade over dry cutting skiving technology. It is a high-speed, continuous cutting technology that efficiently produces internal ring gears with a tool similar to a helical shaper cutter, but with a continuous cutting action, producing gears with high quality and a low surface roughness. It can machine gears without needing an undercut or groove, allowing for programming of the gear end with a radius. This method is known for its rapid cycle times and the ability to produce high-quality gears with low surface roughness, making it a productive and flexible gear-generating process. The high number of cuts per time unit leads to very short cycle times, making the process very efficient and productive.

Reflecting this shift, Milestone Gears became one of the early adopters of scudding technology for skiving internal ring gears in Calendar Year 2015, establishing its leadership in advanced gear manufacturing. As of June, Fiscal 2025, the company manages an extensive fleet of approximately 9 profilator scudding machines from Germany for internal ring gears, and have a significant concentration of these machines in India as of June 30, 2025.

Key characteristics of machining:

- **Capital & skill-intensive**: Machining demands significant investment in advanced CNC machines, precision tooling & controlled environments. Strict quality protocols further add to operational costs and process complexity.

- **Precision & tight tolerances**: Sectors such as automotive require components manufactured to extremely tight tolerances with superior surface finishes, necessitating advanced processes and highly skilled machinists.

Complexity involved in the machining process:

- **Material-related issues:** Machining diverse materials like stainless steel, titanium, aluminium, and plastics involves unique difficulties. Variations in hardness, heat resistance, and machinability require specialised tooling, coated tools, and precise parameter adjustments. Hard-to-machine alloys, in particular, accelerate tool wear and complicate quality control.

- **Programming & process complexity:** Advanced CNC machining relies on intricate programming. Errors in G-code (programming language used to control CNC machines), toolpaths, or parameters can lead to scrap, tool collisions, or inefficiencies. As designs grow more complex, translating them into accurate, executable programs demands skilled programmers and robust simulation systems.

- **Tool wear & breakage:** Cutting tools endure high stress, heat, and friction, especially with hard materials or long production runs. Wear or breakage can result in surface defects, dimensional inaccuracies, and downtime. Proactive monitoring and timely replacements are necessary, but add to costs and operational difficulty.

- **Fixturing & workpiece handling:** Securing and handling components, whether small, large, intricate or thin-walled, is critical. Improper clamping can cause micro-movements, deformation, or part loss mid-

process. This often necessitates customised fixtures, which increase setup time and costs.

Key trends & growth drivers of the machining market

As India consolidates its position as a global manufacturing hub, key trends such as automation, CNC integration, and advanced quality control systems are reshaping the production landscape. Government initiatives promoting localisation and self-reliance, coupled with the rising adoption of Industry 4.0 technologies, are further accelerating growth. Together, these factors are driving higher productivity, improved quality, and lower operational costs, firmly positioning the Indian machining industry for sustained expansion in the years ahead.

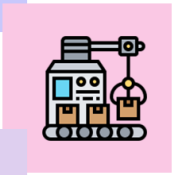
Key trends and growth drivers of machining components in India

Automation & robotics

- Automated CNC[1] setups are being widely deployed with capabilities such as part loading, tool changing, inspections, enabling lights-out production, and significant labour reduction
  - Integration with robotics enhances precision and throughput while addressing labour shortages

CNC & multi-axis machining

- The shift from 3-axis to 5- or 6-axis CNC machines enables complex geometries with fewer setups, reducing lead-times by 30-40% in many cases
- Hybrid CNC systems combining subtractive and additive manufacturing are gaining traction for faster prototyping and material efficiency

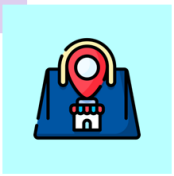


IoT, industry 4.0 & smart factory tech

- IoT-enabled machining systems offer real-time monitoring, predictive maintenance, and optimization through digital twins and advanced analytics
- Data-driven quality improvements are enabled by machine-embedded sensors and analytics tools that minimize downtime and enhance yield

Localization of manufacturing

- Companies are increasingly localizing component manufacturing to reduce reliance on imports, mitigate supply chain risk, and benefit from government incentives under schemes like Make in India and the PLI[2]
- Increasing import costs, volatile foreign exchange rates, and geopolitical uncertainties are making localization a strategic approach for both cost efficiency and risk mitigation



Note(s): [1]Computer Numerical Control, [2]Production Linked Incentive

Deep dive into the components market size

The automotive and off-highway vehicle markets rely heavily on a variety of transmission components, each playing a crucial role in performance and efficiency. In automotive vehicles, rear axles and differential systems are designed primarily for speed, efficiency, and stability on paved surfaces. They typically use ring and pinion gearsets or planetary gear systems to deliver smooth torque transfer at high speeds. Axles are often live or semi-independent, with gearing designed for relatively consistent torque loads without extreme shock or terrain variations.

In off-highway vehicles, including tractors and construction equipment, the design priorities shift toward high torque, durability, and shock absorption, as these vehicles operate in rough terrains and low-speed, high-load conditions. The rear axle often includes an inboard reduction, where torque from the differential pinion is transmitted through a bull gear to the axle shaft.

Tractor auto components market value

The tractor auto components market forms a critical backbone of the agricultural machinery industry, underpinning the high-volume tractor segment within the off-highway ecosystem. These components are designed to deliver efficient power transmission, durability, and consistent performance under demanding field conditions. With tractors serving as the primary drivers of farm mechanisation, the demand for high-quality and reliable components has expanded in tandem.

Key components include:

Types of tractor auto components		
Gear component		**Function**
	Bull gears	• Transmit high torque from the engine to the axle for power transfer in heavy-duty operations
	Transmission gears	• Convert the motor's high speed into strong, steady torque for the wheels
	Internal ring gears	• Integral to the differential system to support smooth cornering and traction control
	Rear axles	• Bear load & transfer power from the transmission to the wheels to ensure vehicle stability
	Transmission shafts	• Link engine & gearbox components to allow seamless torque transmission
	Induction hardened shafts	• Enhanced wear resistance for high-load & long-life performance
	Rock shafts	• Part of the hydraulic lift system, transferring power to lift arms or implements for controlled motion

Growth drivers for key tractor components

- **Bull gears** are seeing higher penetration in low- and mid-horsepower (<50 HP) tractors, which commonly use simple and robust driveline systems where bull gear final drives offer reliable torque transmission for field and haulage operations.

- **Transmission gears** are playing a critical role in enabling efficient performance with the acceleration of EV adoption. Gear components within these systems allow the conversion of motor speed into usable torque, thereby ensuring smooth and reliable vehicle operation

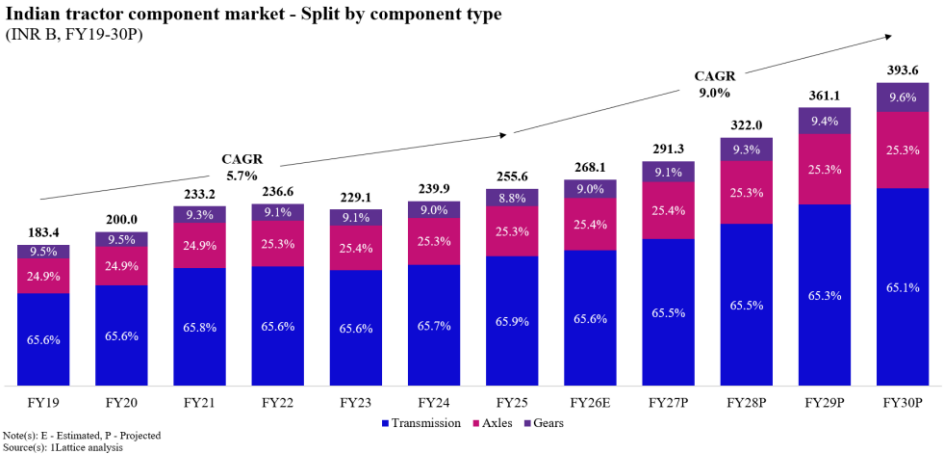
- **Internal ring gears** demand is growing consistently, with adoption supported by the rising use of advanced differential systems that improve traction and maneuverability in varied terrains.

- **Rear axles, transmission shafts and rock shafts** are becoming more critical as tractors are used beyond farming (e.g., transport, commercial haulage), demanding stronger load-carrying capability and smoother power transfer. The challenge of high cost and suboptimal performance of rear axles in the late 1980s was effectively mitigated through the adoption of induction hardening technology.

- **Induction hardened shafts** are increasingly adopted to reduce wear & manufacturing cost and extend component life & performance, particularly for tractors operating under continuous, high-load conditions in emerging markets.

Indian tractor component market is projected to grow approximately ₹ 255.6 billion in Fiscal 2025 to approximately ₹ 393.6 billion in Fiscal 2030

The Indian tractor component market grew from approximately ₹ 183.4 billion in Fiscal 2019 to approximately ₹ 255.6 billion in Fiscal 2025, registering a CAGR of approximately 5.7%. Looking ahead, the market is projected to reach approximately ₹ 393.6 billion by Fiscal 2030, expanding at a CAGR of approximately 9.0% between Fiscal 2025 & Fiscal 2030. Transmission components dominate the segment, contributing approximately 65.6% in Fiscal 2019, approximately 65.9% in Fiscal 2025, and an expected approximately 65.1% by Fiscal 2030. Axles follow with approximately 24.9% in Fiscal 2019 and approximately 25.3% in Fiscal 2025, while gears remain stable at approximately 9% through Fiscal 2019 to 2025. Growth is primarily driven by rising tractor production volumes, increasing mechanisation across rural India, and higher demand for precision transmission systems. In addition, replacement demand for older components and durable gears continues to support steady market expansion.



In terms of volume for key components, the Indian tractor industry recorded sales of approximately 1.04 million units in Fiscal 2025, reflecting continued demand across the agricultural and allied sectors. Of these, approximately 64% of tractors (approximately 0.67 million) were equipped with bull-gear-based transmissions. With each tractor requiring 2 bull gears, the total demand for bull gears in Fiscal 2025 is estimated at 1.34 million units. Similarly, approximately 30% of tractors (approximately 0.31 million) uses internal ring-gear. With 2 internal ring gears per tractor, the resulting requirement for ring gears is roughly 0.62 million units. The remaining tractors, approximately 6%, employed alternative transmission designs.

Beyond transmission components, certain mechanical parts are standard across all tractors. Every tractor includes 1 rockshaft, giving a total demand of 1.04 million rockshafts in Fiscal 2025. Additionally, each tractor is fitted with 2 rear axles, creating a requirement of 2.08 million rear axle assemblies. Collectively, these figures highlight the strong correlation between tractor sales and component demand.

Key tractor component sourcing trends in India

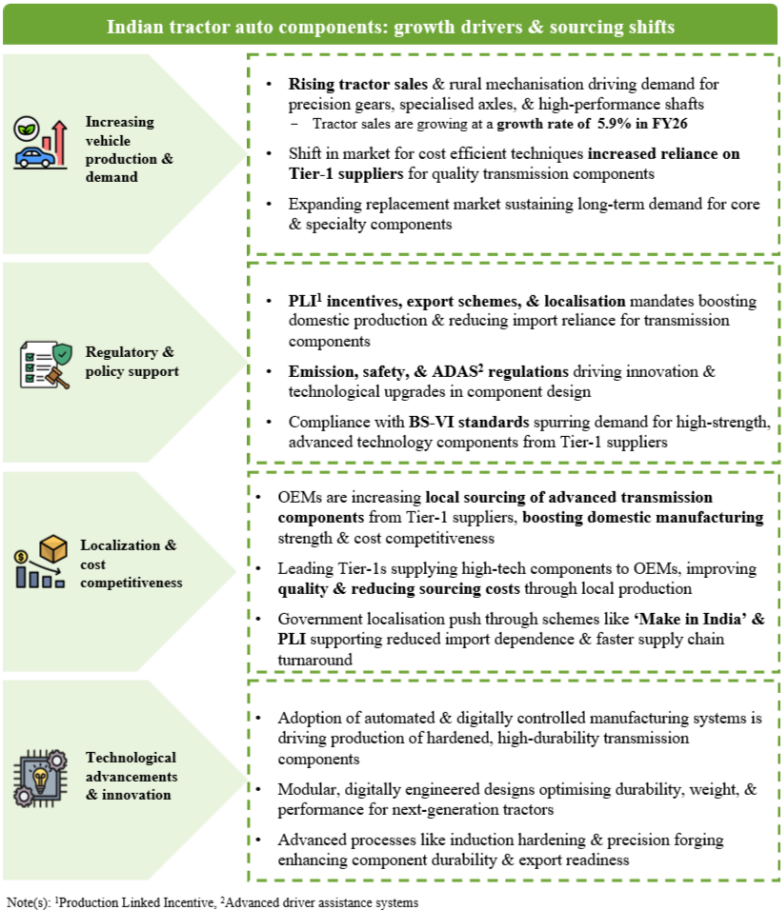
Several key factors drive the Indian tractor auto components market:

- **Demand push:** Rising farm mechanisation, replacement demand & growing use of agricultural equipment are driving component sales.
- **Policy backing:** Government initiatives such as PLI & Make in India are boosting local, high-tech component production.
- **Localisation:** OEMs are partnering with suppliers to reduce import dependence & achieve cost efficiency through local sourcing
- **Innovation edge:** Suppliers are advancing technology, for e.g., induction hardening for shafts & modular axle/gear designs, to align with global standards. The challenge of high cost and suboptimal performance of rear axles in the late 1980s was effectively mitigated through the adoption of induction hardening technology.
- Captive vs non-captive trends in the Indian tractor component market:
    - The Indian tractor component market has historically been dominated by captive manufacturing, with OEMs preferring in-house production to maintain control over quality & cost. However, in recent years, a gradual shift toward non-captive sourcing has emerged, driven by capacity constraints, cost efficiency, & the need to leverage specialised supplier expertise. The current captive vs non-captive split in the tractor component market is as follows:
        - **Transmissions**: approximately 98 to 99% captive; approximately 1 to 2% non-captive
        - **Axles**: approximately 70 to 75% captive; 25 to 30% non-captive
        - **Gears**: approximately 5 to 7% captive; 93 to 95% non-captive

- **Axle sourcing:** Axle sourcing is partly captive & partly outsourced, with approximately 25 to 30% of the market being non-captive. Mahindra & Mahindra & TAFE maintain in-house axle production but outsource for higher horsepower 4WD models (>49 HP).

- **Transmission sourcing:** Transmission manufacturing remains almost entirely captive, with approximately 98 to 99% of production in-house by OEMs. This reflects the strategic importance of transmissions as a core competency, where manufacturers prefer tighter control over design, quality & cost efficiency, leaving little room for outsourcing.

- **Gear sourcing:** Gear sourcing is predominantly non-captive, with approximately 93 to 95% outsourced in Calendar Year 2023. This high reliance on suppliers stems from the specialised precision required in gear manufacturing, where dedicated gear makers can deliver better economies of scale & technological expertise than OEM captive units.



Note(s): [1]Production Linked Incentive, [2]Advanced driver assistance systems

The Indian tractor industry has a balanced sourcing model, with major OEMs such as Mahindra & Mahindra, TAFE and Escorts relying on both captive and non-captive channels. However, non-captive sourcing is steadily increasing, particularly for rear axles, induction-hardened shafts and certain standardised gear components, driven by the rise of specialised Tier-1 suppliers and cost-competitive ancillary units in manufacturing clusters. As tractor production scales for both domestic and export markets, OEMs are diversifying sourcing to reduce dependence on captive setups and leverage supplier specialisation.

Indian construction vehicle component market is projected to grow from approximately ₹ 161.9 billion in Fiscal 2025 to approximately ₹ 206.5 billion by Fiscal 2030

The Indian construction vehicle component market grew from approximately ₹ 122.0 billion in Fiscal 2019 to approximately ₹ 161.9 billion in Fiscal 2025, at a CAGR of approximately 4.8%. It is projected to reach approximately ₹ 206.5 billion by Fiscal 2030, growing at a CAGR of approximately 5.0% over Fiscal 2024 to 2030. Of the overall market in Fiscal 2025, transmission components contributed the largest share (63.1%), followed by axles (26.2%) and gears (10.8%). By Fiscal 2030, transmission components are expected to maintain the largest share at approximately 63.3%, with axles at 26.2% & gears at 10.5%. Market growth is being driven

by rising infrastructure activity, greater construction equipment deployment & increasing demand for durable, locally manufactured gear components. OEMs are also shifting towards cost-efficient domestic sourcing to strengthen supply chain resilience and reduce import reliance.

Growth drivers for key construction equipment components

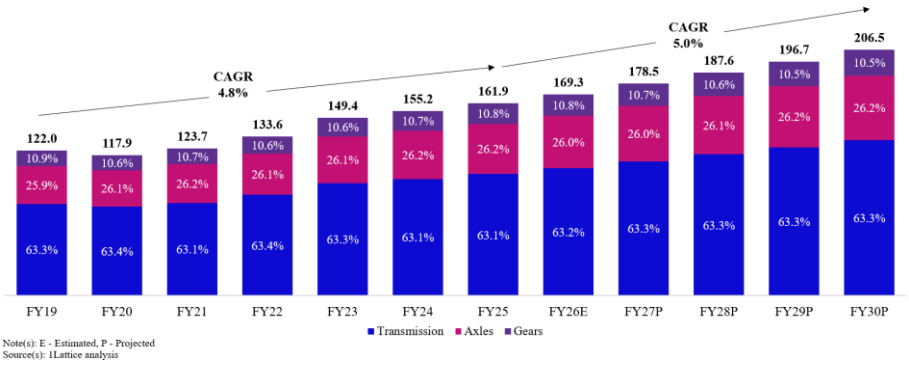
- **Transmission gears and shafts** are witnessing deeper penetration as OEMs adopt power-shift and CVT (continuously variable transmission) systems to enhance fuel efficiency and productivity in loaders, backhoes and excavators

- **Bull gears and rear axles** play a critical role in construction and mining machines, enabling high torque transmission and heavy load-bearing capacity essential for durability in demanding operating cycles

- **Induction hardened shafts** are seeing wider adoption as equipment faces prolonged duty cycles, requiring superior resistance to abrasion and fatigue

- **Internal ring gears** remain vital in heavy equipment drive systems, with penetration expanding in line with infrastructure development & mining sector growth

Indian construction equipment component market - Split by component type
(INR B, FY19-30P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

Key construction equipment component sourcing trends in India

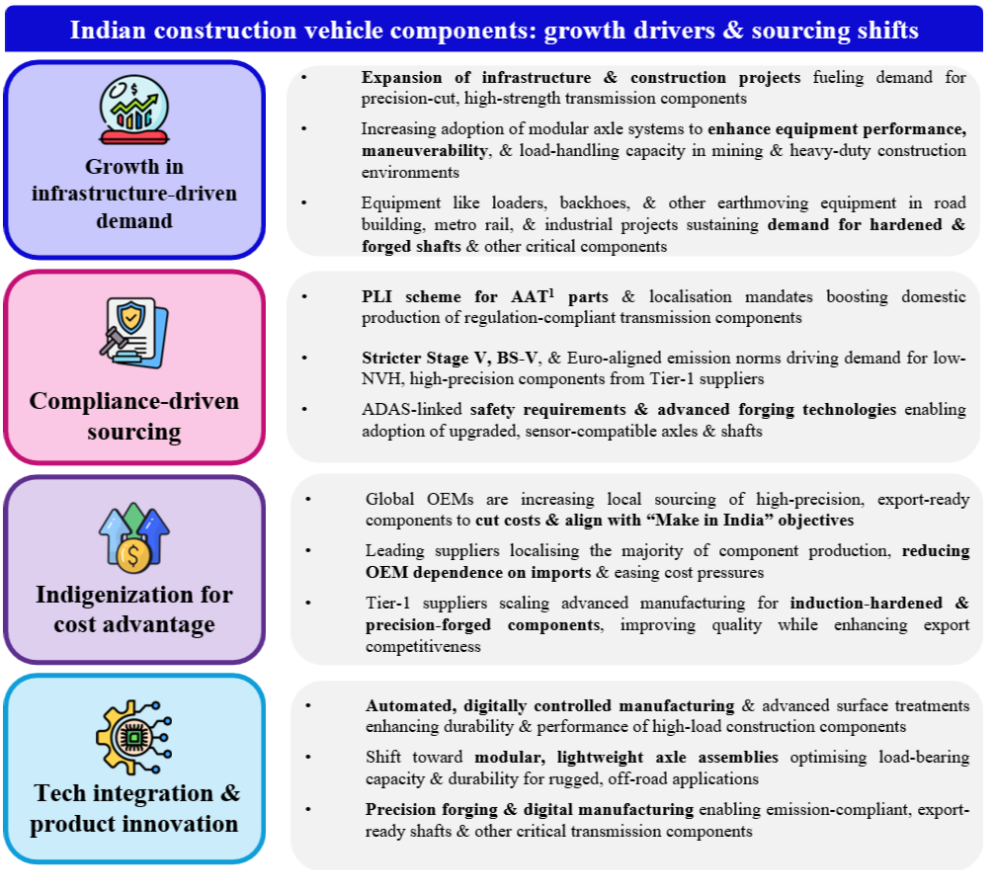
India's booming infrastructure sector is accelerating demand for construction vehicles, prompting OEMs to adopt more agile & cost-efficient sourcing strategies. Backed by policy support such as the PLI scheme & Bharat stage V norms, OEMs are increasingly outsourcing critical components, including transmission gears, axles & shafts to specialised tier-1 suppliers to drive scale, innovation & localisation.

- **Captive & non-captive trends in the Indian construction component market:**

    - **Transmission sourcing**: Transmissions were historically produced almost entirely in-house, but outsourcing has steadily increased as OEMs seek cost savings and avoid heavy capital investments. By Fiscal 2023, approximately 60 to 65% remained captive, while approximately 35 to 40% were outsourced. Smaller OEMs, in particular, rely on suppliers for advanced powertrain technologies & compliance with Stage V emission norms.

    - **Axle sourcing**: Axles, once largely captive, have gradually shifted towards outsourcing, resulting in a near-balanced split in Fiscal 2023, with approximately 45 to 50% captive & approximately 50 to 55% outsourced. This reflects OEMs' growing dependence on suppliers for economies of scale, localisation benefits & designs tailored to India's infrastructure-led demand

    - **Gear sourcing**: Gear sourcing has undergone the sharpest shift, moving from a captive–non-captive mix to being almost fully outsourced. In Fiscal 2023, only approximately 5 to 7% remained captive, while approximately 93 to 95% were outsourced. Unlike tractors, where outsourcing is scale-driven, construction equipment OEMs outsource gears primarily to leverage suppliers' R&D & precision expertise, ensuring durability & performance in heavy-duty applications.

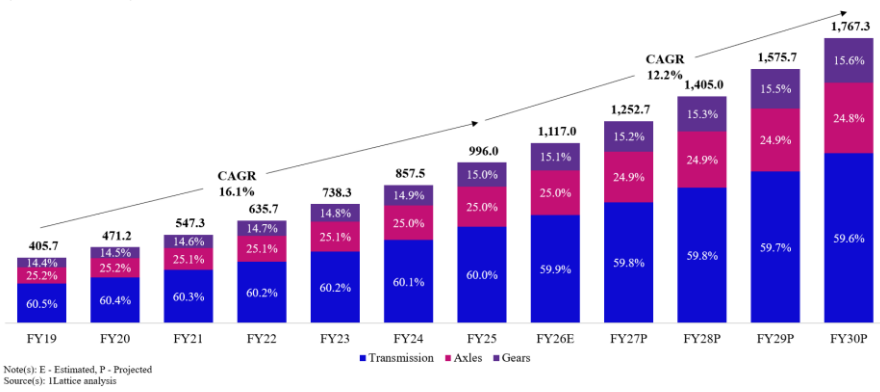


Note(s): [1]Advanced automotive technology

Indian passenger vehicle component market is projected to grow from approximately ₹ 996.0 billion in Fiscal 2025 to approximately ₹ 1,767.3 billion in Fiscal 2030

The Indian passenger vehicle component market grew from approximately ₹ 405.7 billion in Fiscal 2019 to approximately ₹ 996 billion in Fiscal 2025, registering a CAGR of approximately 16.1% during the period. It is further projected to reach approximately ₹ 1,767.3 billion by Fiscal 2030, expanding at a CAGR of approximately 12.2% over Fiscal 2025 to 2030. In Fiscal 2025, transmission components held the largest share at approximately 60%, followed by axles (approximately 25%) and gears (approximately 15%). By Fiscal 2030, the trend is expected to remain consistent, with transmissions contributing approximately 59.6%, axles approximately 24.8% and gears approximately 15.6%. Growth is being driven by rising passenger vehicle production, greater demand for fuel-efficient & performance-driven drivetrains, and the increasing penetration of automatic and electric transmission systems. Additionally, OEMs are placing stronger emphasis on precision gear manufacturing and localised sourcing to improve quality & cost competitiveness.

Indian passenger vehicle component market - Split by component type
(INR B, FY19-30P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

Growth drivers for key passenger vehicle components

- **Transmission gears and shafts** remain core to all passenger vehicles, but penetration is evolving toward lighter and more compact designs to meet stricter fuel efficiency and emission norms.

- **Rear axles** are widely utilised in SUVs, MUVs, and pick-up trucks, where greater load bearing and traction capability is required compared to compact cars.

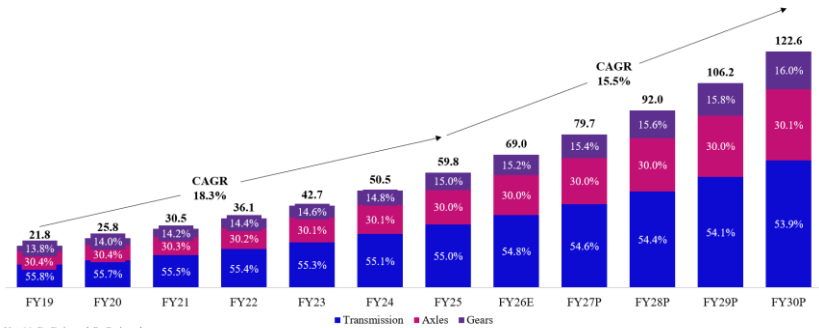
- **Internal ring gears** are commonly used within planetary gear systems of automatic and hybrid transmissions, enabling compact design and efficient torque transfer.

- **Induction hardened shafts** are witnessing wider adoption as OEMs push for longer service life, reduced warranty claims, and smoother performance in premium as well as mass-market vehicles.

Indian passenger EV vehicle component market is projected to grow from approximately ₹ 59.8 billion in Fiscal 2025 to approximately ₹ 122.6 billion by Fiscal 2030

The Indian passenger EV vehicle component market grew from approximately ₹ 21.8 billion in Fiscal 2019 to approximately ₹ 59.8 billion in Fiscal 2025, recording a strong CAGR of approximately 18.3% during the period. Growth was driven by rising EV adoption & growing importance of efficient drivetrains. It is projected to reach approximately ₹ 122.6 billion by Fiscal 2030, expanding at a CAGR of approximately 15.5% over Fiscal 2025 to 2030 (This market sizing focuses specifically on transmission, gears, and axles of EVs and does not include other critical components such as batteries, wiring harnesses, inverters, electric motors, etc.). Of the overall market, transmission components contributed the largest share of approximately 55% in Fiscal 2025, followed by axles (approximately 30%) & gears (approximately 15%). This trend is expected to continue in Fiscal 2030 with transmissions at approximately 53.9%, axles at approximately 30.1% & gears at approximately 16%, reflecting the sustained focus on drivetrain efficiency as a key enabler for EV performance & consumer preference for green mobility.

Indian passenger EV vehicle component market - Split by component type
(INR B, FY19-30P)



Note(s): E - Estimated, P - Projected
Source(s): 1Lattice analysis

Growth drivers for key passenger EV vehicle components

- **Reduction gears** are replacing traditional multi-speed transmission gears, with penetration growing rapidly as EV sales rise; these are optimised to handle the high RPM and torque of electric motors.

- **Transmission shafts and induction hardened shafts** are being redesigned with higher strength-to-weight ratios, enabling them to withstand instant torque delivery and prolonged stress unique to EV drivetrains.

- **Internal ring gears** are increasingly incorporated into EV drive units and e-axles, providing compact power transfer solutions suited for electric mobility.

- **E-axles** are shifting towards independent and modular EV-specific designs, improving packaging flexibility and efficiency, particularly in premium and high-performance EVs.

As EV adoption accelerates, EV drivetrain components must increasingly comply with stringent standards. Over the past three years, Milestone Gears has acquired drivetrain manufacturing expertise, positioning the company to fulfil Indian OEMs' accelerating shift to domestic procurement of these critical assemblies. The company is also well positioned to capture the wave of global supply-chain diversification away from China that is redirecting a substantial share of EV component demand to India.

Sourcing trends for EV components:

Non-captive sourcing is rapidly gaining traction as Tier-1 suppliers invest in EV-specific gear and shaft manufacturing capabilities. Induction-hardened shafts and lightweight E-axles are increasingly sourced from specialised vendors to meet stringent performance and efficiency requirements. Collaboration between OEMs and non-captive suppliers is growing as EV makers seek to reduce costs, accelerate localisation, and integrate innovative materials and designs to improve range and performance.

For most Indian auto component manufacturers, the electric vehicle (EV) parts market remains in its early stages. In Fiscal 2024, only about 30 to 40% of the EV supply chain was localised (as per ICRA), with critical components such as battery cells still entirely imported. This stage is characterised by a steep capability-building curve and the need for substantial investment in new technology and R&D to scale up domestic manufacturing.

Risks in EV component space

- EV adoption linked to **policy and charging infrastructure** – Industry growth is tied to charging ecosystem readiness and government support; any moderation in these factors may temporarily affect demand.

- **Evolving technology landscape**, continuous innovation in drivetrains, batteries, and e-axles requires ongoing R&D; staying ahead ensures competitiveness.

- **China manufacturing dependence**, many EV component suppliers rely on Chinese manufacturing for key materials or subcomponents; geopolitical tensions, trade restrictions, or supply chain disruptions may impact production and cost structures.

- **Customer concentration**, dependence on select OEMs is common in the sector; diversifying the customer base helps mitigate overreliance and prevent demand shocks.

- **Product reliability and safety**, components form part of high-performance EV systems, and stringent quality assurance is essential to mitigate recall or liability risks.

Key passenger vehicle component sourcing trends in India

Over the past two decades, the sourcing strategy of Indian automotive OEMs has undergone a clear transformation. In the past, a large share of component manufacturing, particularly for powertrain and transmission systems, was carried out within the company. With increasing vehicle complexity and rising global supply chain competitiveness, OEMs have gradually shifted away from in-house production for several components such as transmission gears, axles and shafts. This change reflects a wider industry move towards capital-light operations and a stronger dependence on specialised vendors.

Contract manufacturing enables companies to accelerate production schedules and launch vehicles faster by tapping into the manufacturing infrastructure of third-party producers. This approach is particularly advantageous for startups and conventional automakers venturing into the BEV segment, as it lets them concentrate on innovation while outsourcing scalable production to experienced partners.

This shift is primarily driven by three factors:

- Outsourcing of cost optimisation & scalability improves cost-efficiency & enables faster ramp-up, allowing OEMs to focus on core competencies.

- Tier-1 suppliers with access to technology offer advanced capabilities such as induction hardening, skiving & digital machining.

- Increasing regulatory requirements, such as Stage V emission norms and ADAS-ready driveline systems, have encouraged OEMs to engage suppliers with compliance-ready infrastructure. As a result, precision components are now predominantly sourced from tier-1 vendors, who are scaling up to meet both domestic and global demand.

This transformation is strongly shaped by government-led policies and initiatives:

- **Production Linked Incentive (PLI) scheme:**

  - The Union Cabinet approved the PLI Scheme for automobile & auto components in Fiscal 2022, with a budgetary outlay of approximately ₹ 26 thousand crore covering Fiscal 2023 to Fiscal 2027 (disbursement from Fiscal 2025 onward).

  - The scheme focuses on boosting domestic manufacturing of advanced automotive technology (AAT) products, including electric & hydrogen fuel cell vehicle components.

  - To qualify for PLI incentives, applicants must achieve at least 50% domestic value addition (DVA) on approved products, a threshold verified through government-certified SOPs. Several OEMs & component manufacturers have received DVA certification for multiple product variants.

  - The scheme covers both domestic & export sales and offers incentives of approximately 13 to 18% for EV/hydrogen fuel cell components and approximately 8 to 13% for other AAT components.

- **Make in India & localisation push:**

  - Since its launch, the Make in India initiative has driven greater localisation across the auto sector, with deep policy support aiming to create a globally competitive supply chain, reduce reliance on imports, and drive technology upgrades.

  - India's automotive sector now employs approximately 30 million people, making it a major employer and a centrepiece of the manufacturing industry.

With such policies, the government of India is accelerating EV adoption through demand incentives, FAME-II schemes, PLI-based manufacturing subsidies, concessional GST, state-level tax & registration benefits, and rapid expansion of charging infrastructure, creating a highly favourable environment for sustained market growth.

Reflecting India's growing prominence as a global EV manufacturing hub, Milestone Gears entered the fast-growing EV segment to cater to rising domestic procurement needs & capitalise on the global supply-chain shift away from China & Taiwan, which is channelling a significant share of EV component demand to India.

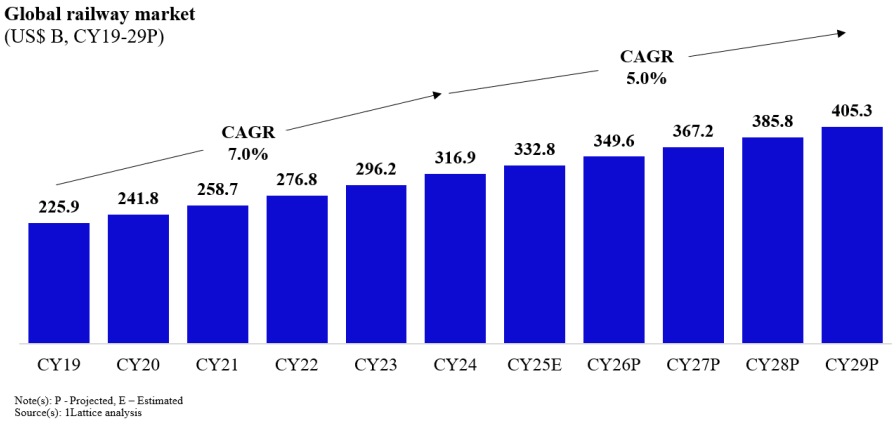
Outsourcing trend in the passenger vehicle market:

High entry barriers in the passenger vehicle market stem from OEMs like Mahindra, John Deere & Kubota maintaining stringent policies on onboarding new vendors, while also pursuing China+1 sourcing strategies. These dynamics benefit domestic suppliers such as Milestone Gears, Happy Forgings & Carraro, who already supply critical components to Mahindra, underscoring how established vendor-OEM partnerships remain central to the ecosystem. Bosch, one of the top global suppliers of technology for EVs, further exemplifies how established vendor, OEM partnerships and advanced technology players remain central to the ecosystem.

Other growing markets (Railway & windmill)

Railways - locomotive & metro
Global railway market grew from approximately USD 225.9 billion in Calendar Year 2019 to approximately USD 316.9 billion in Calendar Year 2024

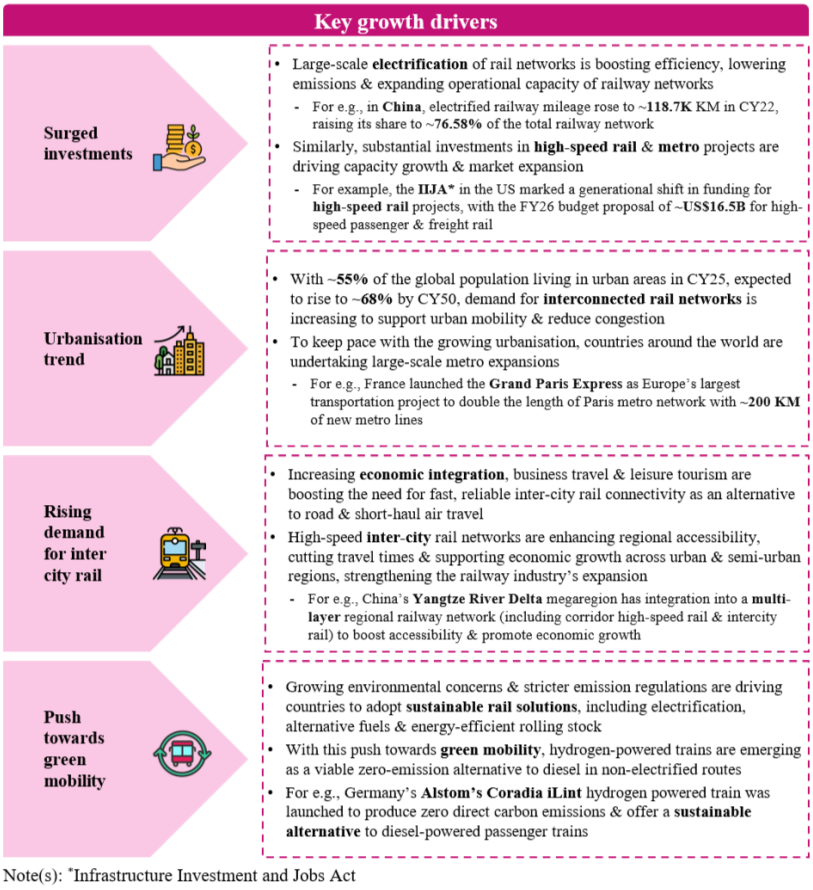
The global railway market grew from approximately USD 225.9 billion in Calendar Year 2019 to approximately USD 316.9 billion in Calendar Year 2024, recording a CAGR of approximately 7%. Growth during this period was supported by factors such as rising urbanisation, expansion of high-speed rail networks & increased government investments in sustainable transport. Looking ahead, the market is projected to reach approximately USD 405.3 billion by Calendar Year 2029, at a CAGR of approximately 5% over Calendar Year 2024 to 2029. This sustained momentum underscores the railway sector's critical role in passenger & freight mobility, backed by continuous investment in capacity, connectivity, and technological upgrades worldwide.



Note(s): P - Projected, E – Estimated
Source(s): 1Lattice analysis

Global railway market growth is driven by electrification trends, high-speed rail & metro projects, growing urbanisation & green mobility push

The global railway market is driven by significant investments in infrastructure & electrification, rapid urbanisation, growing demand for inter-city rail services & a strong emphasis on green & sustainable mobility solutions.

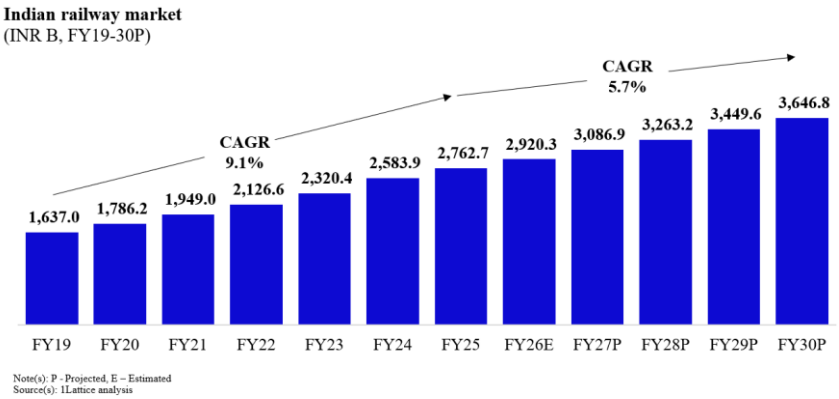


Note(s): *Infrastructure Investment and Jobs Act

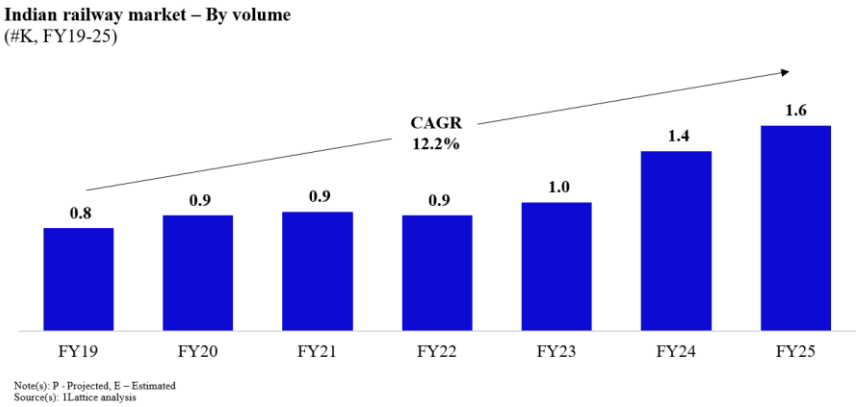
Indian railway market is expected to rise from approximately ₹ 2,762.7 billion in Fiscal 2025 to approximately ₹ 3,646.8 billion in Fiscal 2030

The Indian railway market expanded from approximately ₹ 1,637.0 billion in Fiscal 2019 to approximately ₹ 2,762.7 billion in Fiscal 2025, fuelled by a sharp rise in budgetary allocations, completion of priority electrification projects & steady growth in passenger & freight volumes. Policy push towards "green railways' urban transit needs addressed through metro rail rollouts and modernisation of signalling & rolling stock further reinforced momentum. Looking ahead, the market is projected to reach approximately ₹ 3,646.8 billion by Fiscal 2030, registering a CAGR of approximately 5.7% during Fiscal 2025 to 2030, supported by high-speed rail corridors,

dedicated freight corridors, and sustained capex in digitalisation & safety upgrades.

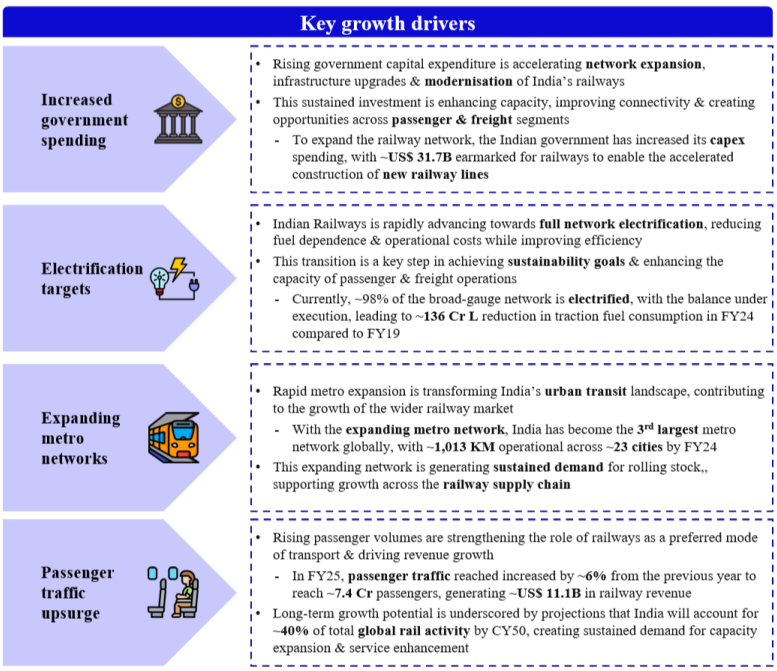


Based on volume, the market grew from approximately 0.8 thousand units in Fiscal 2019 to approximately 1.6 thousand units in Fiscal 2025, recording a strong CAGR of approximately 12.2%. Growth during this period was supported by large-scale capacity expansion in passenger & freight segments, accelerated metro rail rollouts across urban centres, and government-led investments in electrification & modernisation of rolling stock. Rising demand for energy-efficient locomotives & increasing private participation in freight corridors further contributed to the market's expansion.



Government capex push, electrification targets & metro rail expansion support strong momentum in the Indian railway market

The Indian railway market is propelled by a combination of structural & demand-led factors, including strong government capital expenditure, accelerated electrification, rapid metro network expansion & sustained growth in passenger traffic.



Key government initiatives

Alongside these drivers, targeted initiatives by the Indian government are further bolstering the growth & modernisation of the railway market.

- **Make in India initiative:** Under the 'Make in India, make for the world' vision, Indian Railways is rapidly emerging as a global exporter of bogies, coaches, locomotives & propulsion systems. This push is strengthening domestic manufacturing capabilities while positioning India as a competitive supplier in the global rail market. Alstom, a key manufacturer of railway rolling stock in India, has exported approximately 3.8 thousand bogies to countries such as Germany, Egypt, Sweden, Australia & Brazil, along with approximately 4 thousand flatpacks to Vienna, Austria. Similarly, Alstom's Maneja unit has contributed by exporting approximately 5 thousand propulsion systems to international projects, reinforcing India's growing footprint in high-quality rail component exports.

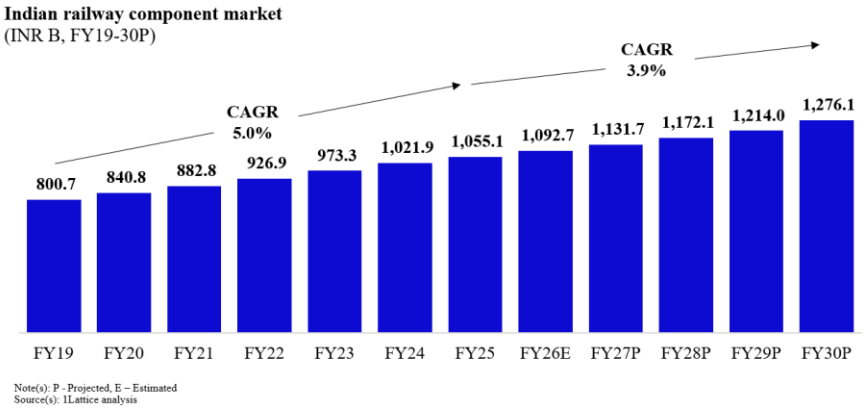
- **Vande Bharat roll-out:** The Vande Bharat programme is transforming passenger travel in India, with approximately136 trains operational in Calendar Year 2024. Building further on this, Indian Railways has introduced the Vande Bharat sleeper train set, designed to redefine long-distance travel. The first 16-car sleeper prototype has completed successful trials, paving the way to produce approximately 9 more sets in Calendar Year 2025. By enhancing speed, comfort & efficiency for long-haul passengers, the initiative is expected to boost demand for advanced rolling stock, supporting the overall growth of the Indian railway market.

- **Dedicated freight corridors:** Dedicated Freight Corridors (DFCs) are reshaping India's freight rail network by providing exclusive tracks for cargo movement, eliminating delays caused by mixed passenger operations. The Eastern & Western DFCs have significantly reduced transit times, lowered logistics costs & improved reliability, strengthening the competitiveness of Indian industries. With approximately 96.4% of the planned approximately 2,843 Km network already operational, these corridors are boosting freight capacity & efficiency, creating a strong growth catalyst for India's railway freight market.

Indian railway component market size grew from approximately ₹ 800.7 billion in Fiscal 2019 to approximately ₹ 1,055.1 billion in Fiscal 2025

The Indian railway component market grew from approximately ₹ 800.7 billion in Fiscal 2019 to approximately ₹ 1,055.1 billion in Fiscal 2025, driven by rapid electrification of railway lines, expansion of metro rail projects in major cities & rising procurement of passenger coaches & freight wagons. Government focus on indigenisation under 'Make in India' also encouraged higher domestic production of key components, reducing import reliance. It is further projected to reach approximately ₹ 1,276.1 billion in Fiscal 2030, with a CAGR of approximately

3.9% during the period. Growth will be supported by ongoing fleet modernisation, localisation of manufacturing & greater adoption of advanced components to enhance safety, efficiency & sustainability.



Based on component type, forging & machining accounted for approximately 35 to 40% of the Indian railway component market, reflecting the high demand for heavy-duty structural parts such as axles, wheels, couplers & bogies that form the backbone of rolling stock. Electrical components contributed approximately 20 to 25%, driven by accelerated electrification of railway lines, signalling upgrades & the integration of advanced traction systems. Composites & polymers formed approximately 10 to 15%, supported by the adoption of lightweight materials in coach interiors & non-structural applications to improve energy efficiency. The remaining approximately 20 to 25% share was captured by other mechanical parts, including braking systems & ancillary fittings, underscoring the critical role of safety and performance-focused components in railway operations.

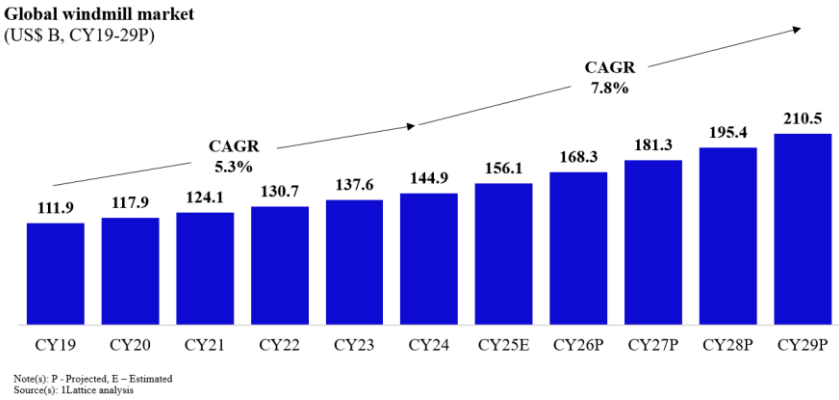
Demand for transmission components in the locomotive sector is being driven by sustained network expansion and the accelerated replacement of diesel fleets with electric and hybrid traction.

As the sector evolves, Indian OEMs are increasingly forming strategic partnerships & collaborations with leading global players to strengthen technological capabilities & expand supply chains. Progress Rail Services Corporation, a Caterpillar subsidiary and Wabtec Corporation are the leading and largest locomotive components companies in the USA.

Windmill market

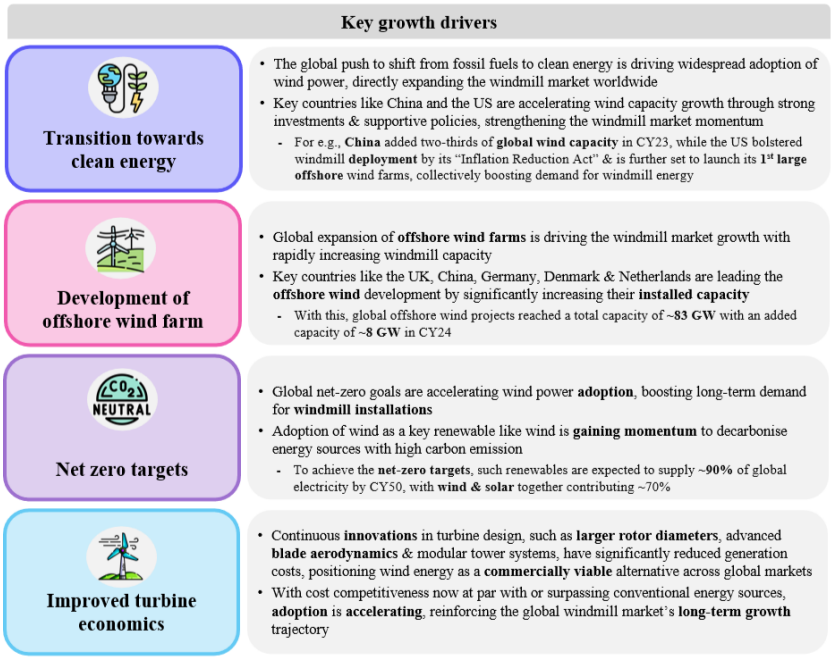
Global windmill market grew from approximately USD 111.9 billion in Calendar Year 2019 to approximately USD 144.9 billion in Calendar Year 2024

The global windmill market rose from approximately USD 111.9 billion in Calendar Year 2019 to approximately USD 144.9 billion in Calendar Year 2024, registering a CAGR of approximately 5.3% during the period. Growth was supported by rising investments in renewable energy to meet decarbonisation targets, declining levelised cost of wind power compared to fossil fuels, and capacity additions in both onshore & offshore segments. Further, the market is projected to expand to approximately USD 210.5 billion in Calendar Year 2029, at a CAGR of approximately 7.8% over Calendar Year 2024 to 2029, underpinned by accelerating clean energy adoption, technological advancements in turbine design & favourable policy frameworks across major economies.



Global windmill market is driven by clean energy transition & offshore wind farm development along with global initiatives like net-zero targets

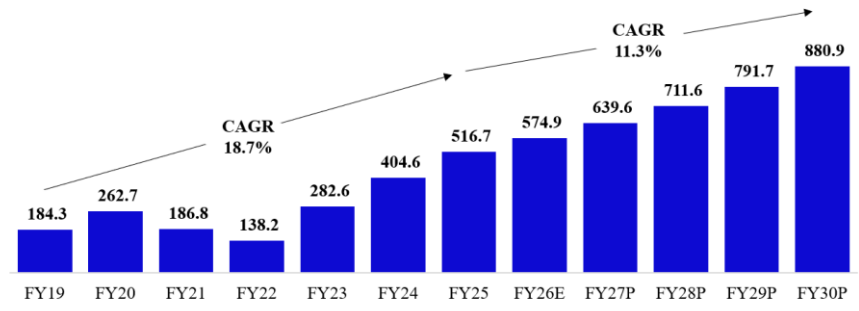
The global windmill market is witnessing strong growth, supported by key industry drivers. These include the global transition towards clean energy, rapid development of offshore wind farms, accelerating adoption to meet net-zero targets, and improved turbine economics. Together, these factors are reshaping the energy landscape and positioning wind power as a cornerstone of the global renewable energy mix.



India windmill market rose from approximately ₹ 184.3 billion in Fiscal 2019 to approximately ₹ 516.7 billion in Fiscal 2025

The Indian windmill market grew from approximately ₹ 184.3 billion in Fiscal 2019 to approximately ₹ 516.7 billion in Fiscal 2025, driven by accelerated renewable energy capacity additions under the National Electricity Plan, strong policy support through mechanisms such as renewable energy certificates (RECs) & competitive tariff-based bidding, and rising private sector participation in large-scale wind projects. Further, it is expected to rise to approximately ₹ 880.9 billion in Fiscal 2030, with a projected CAGR of approximately 11.3% over Fiscal 2025 to 2030. Growth will be supported by India's ambitious renewable energy targets, continued fiscal & policy incentives, and sustained investments in wind power infrastructure, particularly hybrid projects integrating wind & solar.

Indian windmill market
(INR B, FY19-30P)

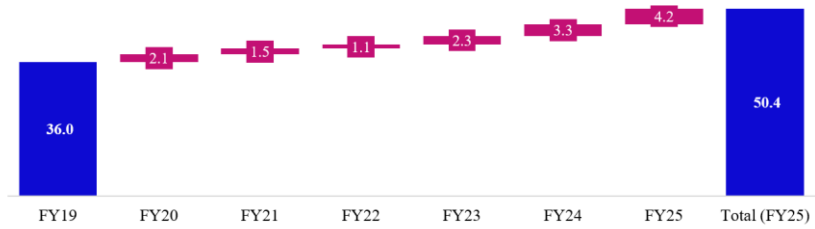


Note(s): P - Projected, E – Estimated
Source(s): 1Lattice analysis

In terms of capacity addition, the windmill capacity expanded from approximately 36.0 GW in Fiscal 2019 to approximately 50.4 GW in Fiscal 2025, driven by steady commissioning of new projects under competitive bidding, repowering of ageing wind farms to improve efficiency & strong policy thrust from schemes such as the National Wind-Solar Hybrid Policy. Capacity growth was further supported by rising corporate demand for green

power under open-access frameworks, favourable land & transmission infrastructure development in high-potential states like Tamil Nadu, Gujarat & Maharashtra, and increased participation from global renewable energy developers in India's wind auctions.

Indian windmill market - Capacity expansion
(GW, FY19-25)



Note(s): P - Projected, E – Estimated
Source(s): 1Lattice analysis

India windmill market is regaining momentum with hybrid projects, turbine repowering, supportive government policies & low generation costs

Windmill market in India is regaining its momentum due to a confluence of factors, including the rise of hybrid projects, repowering of old turbines, a supportive regulatory framework, along a strong OEM base.

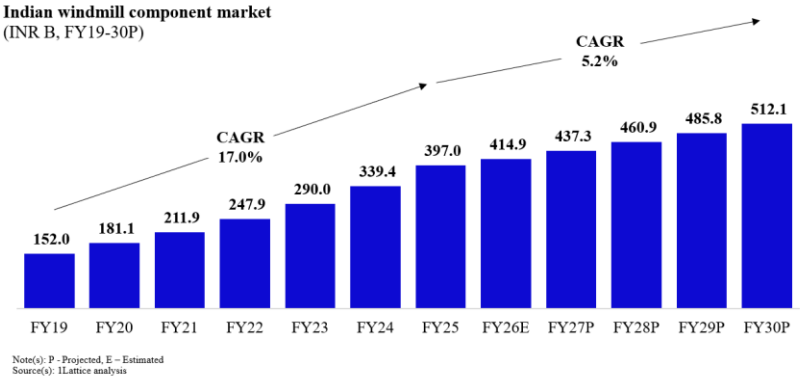
Key growth drivers

Rise in hybrid projects	• Growing **adoption** of solar-wind hybrid projects is driving India's **windmill market** by offering reliable, sustainable & cost-effective power solutions • Support from ambitious **renewable targets** & rising **electricity demand** is accelerating hybrid project deployment - For e.g., **Gujarat** is installing the world's largest renewable energy park with ~**30 GW** solar-wind hybrid capacity
Repowering of old turbines	• The government's repowering initiative is replacing **ageing turbines** with modern, high-capacity models, boosting efficiency & output to drive India's windmill **market growth** • This initiative is **maximizing** renewable generation from existing sites without requiring additional land, improving overall project viability - Such repowering has the potential to lift **nationwide capacity** factors by unlocking substantial untapped **generation potential**
Favourable regulatory policies	• Supportive **government measures** such as renewable purchase obligations, competitive tariff bidding & viability gap funding are fostering **investment confidence** & accelerating **growth** in the wind energy sector • Policy initiatives like the **25-year** Inter-State Transmission System (ISTS) **waiver** for offshore wind projects, also extended to green hydrogen & green ammonia have **lowered transmission costs**, further accelerating adoption
Strong OEM[1] base	• Presence of **leading OEMs** such as Suzlon, Envision, Inox Wind & Siemens supports domestic manufacturing, technology upgrades & faster project execution, driving overall market growth • Such OEMs are deploying advanced solutions like **LiDAR[2] resource assessment**, digital **SCADA[3]** systems & **AI[4]-driven** predictive maintenance to improve turbine performance, while also expanding into offshore wind & repowering projects

Note(s): [1]Original equipment manufacturer, [2]Light detection & ranging, [3]Supervisory control & data acquisition, [4]Artificial intelligence

Indian windmill components market grew from approximately ₹ 296 billion in Fiscal 2019 to approximately ₹ 397 billion in Fiscal 2025

The Indian windmill component market rose from approximately ₹ 152.0 billion in Fiscal 2019 to approximately ₹ 397.5 billion in Fiscal 2025, with a CAGR of approximately 17.0%. Market growth was driven by rising deployment of wind projects under central & state renewable energy auctions, growing localisation of critical components such as blades, gearboxes & generators, and policy incentives under schemes like "Make in India" that encouraged domestic production. Supportive financing mechanisms, coupled with increasing participation of global OEMs setting up local facilities, further reinforced market expansion. It is projected to rise to approximately ₹ 512.1 billion in Fiscal 2030, registering a CAGR of approximately 5.2% over Fiscal 2025 to 2030, supported by rising domestic manufacturing capacity, localisation efforts & steady demand from ongoing & upcoming wind power projects.



Based on component type, fabrication & welding contributed approximately 30 to 35% of the market, reflecting the dominance of towers & large structural assemblies that require heavy steel inputs & specialised fabrication facilities. Forging & machining accounted for approximately 25 to 35%, driven by the demand for high-precision parts such as shafts, gears & bearings that form the drivetrain core. Composites contributed approximately 15 to 20%, supported by the rising use of lightweight materials in blades to improve aerodynamic performance & efficiency. Electrical & electronic components formed the remaining approximately 5 to 10%, representing a smaller share as their value contribution is lower compared to large-scale mechanical parts, despite being critical for turbine control & operations.

Key trends:

Emphasis on domestic manufacturing: The high cost and complexity of transporting massive structural parts, such as towers, necessitate a localised manufacturing ecosystem. This strengthens the domestic supply chain for heavy engineering.

Shift to higher-capacity turbines: A move towards larger, more powerful turbines is driving demand for advanced materials like composites. The goal is to maximise energy output, making projects more economically viable and encouraging component manufacturers to develop higher-value products.

Demand for high-reliability drivetrains: As turbines become more powerful, the mechanical stress on internal parts increases. This fuels the need for more complex and durable precision components to ensure long-term reliability and prevent failures.

Company overview & financial benchmarking
Company overview

Milestone Gears, founded in 1984 by technocrat Ashok Tandon, is an Indian manufacturer specialising in precision transmission components. Established in 1984. Milestone Gears manufactures a wide range of precision transmission components, catering to diverse automotive and industrial applications. With over 40 years of experience in manufacturing and supplying transmission components, Milestone Gears has established a solid presence as a well-recognised brand across the sectors it serves and the customers it supports. Its product range covers bull gears, ring gears, rear axles, spindles, transmission gears and transmission shafts, cut bevel gears, rockshafts, induction hardened shafts & planetary drive components, serving leading OEMs in the automotive, tractor & off-highway segments.

Milestone utilises advanced manufacturing techniques, including forging, CNC machining, heat treatment, and rigorous material testing, to ensure high quality, precision, and durability. The forging and heat-treatment operations are conducted using SCADA-controlled furnaces for normalising, hardening and tempering, and iso-thermal annealing, demonstrating meticulous SOP adherence to consistently achieve the metallurgical properties essential for reliable auto component manufacturing. Further, our heat treatment processes are CQI-9 compliant, meeting high metallurgical standards as set in key global OEM's. The company utilises advanced manufacturing techniques, including forging, CNC machining, heat treatment, and rigorous material testing, to ensure high quality, precision, and durability across all its components. This ensures they are suitable for both domestic and international OEM requirements.

Today, Milestone supplied over 700 active parts as of June 30, 2025, out of which several are single-source parts

across nine global geographies and supplies components to all the top nine OEMs in the tractor sector in India. Additionally, Milestone has manufactured ring gears for the top 9 domestic tractor OEMs, in addition to catering to diverse industries like EVs, Construction equipment, Locomotives, Windmills & other heavy industries.

Milestone is manufacturer of high-precision, complex engineered transmission components in terms of volume and product range in Fiscal 2025. The company has established a strong market position across key tractor components in India:

- Holds a market share of approximately 37.0% in bull gears in terms of volume in Fiscal 2025.
- Accounts for approximately 30.0% of the market in internal ring gears for tractors in Fiscal 2025.
- Captures approximately 23.0% of the market for rockshafts and other induction hardened shafts for tractors in Fiscal 2025.
- Holds approximately 22.0% of the market in rear axles for tractors in Fiscal 2025.

The company faces competition in India and overseas, which is influenced by factors including product quality & reliability, breadth of product range, technology, manufacturing capabilities, scope & quality of service, pricing, and brand recognition in the precision components manufacturing industry.

Manufacturing facilities are strategically located near key customer clusters, enhancing responsiveness & delivery efficiency. Further, the company's operations are predominantly in Himachal Pradesh (with 7 of its 9 plants in Himachal Pradesh), providing access to stable, high-quality hydel power that supports the company's ESG commitment through a low-carbon operational footprint. The plants are certified by various global standards, and the company is also in the process of securing Transportation & Power Generation (TPG) certification which is a mandatory pre-requisite for any supplier intending to supply safety-critical components to locomotive OEMs in the United States.

Financial benchmarking

Financial performance of the relevant companies is presented below, highlighting a comparison of revenue, EBITDA, and PAT. It is typical for companies to view their costs and profitability measures in relation to their revenues, which represent the total value of sales, to measure the profitability progress of the business. In view of this, the comparison also includes revenue from operations, revenue from operations (% change), EBITDA, EBITDA Margin (%), PAT, PAT Margin(%), Return on Capital Employed (RoCE%), Return on Net Worth (RoNW%), Net Debt to Equity, Fixed Asset Turnover, Capital Expenditure, Capital Expenditure %, Cash Conversion Cycle, Revenue Breakdown (end-user), Revenue Breakdown (exports) and Revenue Breakdown (imports).

The 'Peers' considered for Milestone Gears Ltd. are Bharat Forge Ltd., Sona BLW Precision Forgings Ltd., Happy Forgings Ltd., Ramkrishna Forgings Ltd., and Shanthi Gears Ltd.

Parameters	Company	Q1 FY26	FY25	FY24	FY23
Revenue from operations (INR million)	Milestone Gears Ltd.	1,680.34	5,301.69	5,333.24	6,129.38
	Bharat Forge Ltd.	39,087.49	1,51,228.03	1,56,820.71	1,29,102.59
	Sona BLW Precision Forgings Ltd.	8,539.07	35,460.21	31,847.70	26,550.10
	Happy Forgings Ltd.	3,538.03	14,088.95	13,582.36	11,965.29
	Ramkrishna Forgings Ltd.	10,152.56	40,341.07	37,045.45	31,928.95
	Shanthi Gears Ltd.	1,348.90	6,046.20	5,360.50	4,456.50
	Company	**Q1 FY26**	**FY25**	**FY24**	**FY23**
Revenue from	Milestone Gears Ltd.	-	(0.59) %	(12.99) %	-

operations (% change)	Bharat Forge Ltd.	-	(3.57) %	21.47%	-
	Sona BLW Precision Forgings Ltd.	-	11.34%	19.95%	-
	Happy Forgings Ltd.	-	3.73%	13.51%	-
	Ramkrishna Forgings Ltd.	-	8.90%	16.02%	-
	Shanthi Gears Ltd.	-	12.79%	20.28%	-

	Company	Q1 FY26	FY25	FY24	FY23
EBITDA (INR million)	Milestone Gears Ltd.	317.67	963.05	705.62	768.31
	Bharat Forge Ltd.	6,817.00	27,131.19	25,660.86	17,764.40
	Sona BLW Precision Forgings Ltd.	2,025.00	9,753.00	9,021.00	6,958.00
	Happy Forgings Ltd.	1,010.00	4,067.00	3,875.40	3,409.40
	Ramkrishna Forgings Ltd.	1,486.10	5,595.60	7,729.10	6,923.20
	Shanthi Gears Ltd.	N/a	1,433.90	1,228.50	1,010.70

	Company	Q1 FY26	FY25	FY24	FY23
EBITDA Margin (%)	Milestone Gears Ltd.	18.91%	18.16%	13.23%	12.53%
	Bharat Forge Ltd.	17.44%	17.94%	16.36%	13.76%
	Sona BLW Precision Forgings Ltd.	23.71%	27.50%	28.33%	26.21%
	Happy Forgings Ltd.	28.55%	28.87%	28.53%	28.49%
	Ramkrishna Forgings Ltd.	14.64%	13.87%	20.86%	21.68%
	Shanthi Gears Ltd.	N/a	23.72%	22.92%	22.68%

	Company	Q1 FY26	FY25	FY24	FY23
PAT (INR million)	Milestone Gears Ltd.	93.61	220.64	67.20	140.65
	Bharat Forge Ltd.	2,838.70	9,132.75	9,101.59	5,083.87
	Sona BLW Precision Forgings Ltd.	1,217.09	5,996.88	5,177.76	3,952.97
	Happy Forgings Ltd.	656.90	2,674.36	2,429.84	2087.00
	Ramkrishna Forgings Ltd.	117.86	4,150.25	2,912.13	2,481.08
	Shanthi Gears Ltd.	226.90	960.30	822.50	670.50

	Company	Q1 FY26	FY25	FY24	FY23
PAT Margin (%)	Milestone Gears Ltd.	5.57%	4.16%	1.26%	2.29%
	Bharat Forge Ltd.	7.26%	6.04%	5.80%	3.94%
	Sona BLW Precision Forgings Ltd.	14.25%	16.91%	16.26%	14.89%

	Happy Forgings Ltd.	18.57%	18.98%	17.89%	17.44%
	Ramkrishna Forgings Ltd.	1.16%	10.29%	7.86%	7.77%
	Shanthi Gears Ltd.	16.82%	15.88%	15.34%	15.05%

	Company	Q1 FY26	FY25	FY24	FY23
RoCE* (%)	Milestone Gears Ltd.	4.41%	12.23%	9.04%	10.18%
	Bharat Forge Ltd.	N/a	15.40%	16.30%	10.20%
	Sona BLW Precision Forgings Ltd.	N/a	18.40%	31.00%	30.40%
	Happy Forgings Ltd.	N/a	19.20%	22.70%	25.70%
	Ramkrishna Forgings Ltd.	N/a	6.48%	19.50%	19.30%
	Shanthi Gears Ltd.	N/a	34.77%	33.86%	32.10%

	Company	Q1 FY26	FY25	FY24	FY23
RoNW* (%)	Milestone Gears Ltd.	6.90%	17.47%	6.46%	14.54%
	Bharat Forge Ltd.	N/a	12.10%	16.60%	13.60%
	Sona BLW Precision Forgings Ltd.	N/a	17.70%	28.50%	26.60%
	Happy Forgings Ltd.	N/a	15.40%	18.70%	23.50%
	Ramkrishna Forgings Ltd.	N/a	11.70%	16.30%	19.50%
	Shanthi Gears Ltd.	N/a	23.83%	23.82%	22.18%

	Company	Q1 FY26	FY25	FY24	FY23
Net debt to equity (Times)	Milestone Gears Ltd.	3.10	3.23	3.23	3.48
	Bharat Forge Ltd.	0.33	0.35	0.61	0.54
	Sona BLW Precision Forgings Ltd.	N/a	(0.48)	(0.03)	(0.04)
	Happy Forgings Ltd.	N/a	N/a	N/a	N/a
	Ramkrishna Forgings Ltd.	N/a	0.66	0.34	0.96
	Shanthi Gears Ltd.	N/a	N/a	N/a	N/a

	Company	Q1 FY26	FY25	FY24	FY23
Fixed asset turnover* (Times)	Milestone Gears Ltd.	0.88	2.80	3.03	4.06
	Bharat Forge Ltd.	N/a	N/a	N/a	N/a
	Sona BLW Precision Forgings Ltd.	N/a	3.40	3.60	3.90
	Happy Forgings Ltd.	N/a	1.10	1.30	1.40
	Ramkrishna Forgings Ltd.	N/a	N/a	1.90	1.90
	Shanthi Gears Ltd.	N/a	7.65	7.43	6.35

	Company	Q1 FY26	FY25	FY24	FY23
Capital Expenditure (INR million)	Milestone Gears Ltd.	82.89	755.94	467.55	646.55
	Bharat Forge Ltd.	N/a	6,144.00	5,089.00	3,006.00
	Sona BLW Precision Forgings Ltd.	N/a	4155.00	3,191.00	3,351.00
	Happy Forgings Ltd.	N/a	N/a	N/a	N/a
	Ramkrishna Forgings Ltd.	N/a	N/a	N/a	N/a
	Shanthi Gears Ltd.	N/a	N/a	N/a	N/a

	Company	Q1 FY26	FY25	FY24	FY23
Capital Expenditure (%)	Milestone Gears Ltd.	4.93%	14.26%	8.77%	10.55%
	Bharat Forge Ltd.	N/a	4.06%	3.25%	2.33%
	Sona BLW Precision Forgings Ltd.	N/a	11.72%	10.02%	12.62%
	Happy Forgings Ltd.	N/a	N/a	N/a	N/a
	Ramkrishna Forgings Ltd.	N/a	N/a	N/a	N/a
	Shanthi Gears Ltd.	N/a	N/a	N/a	N/a

	Company	Q1 FY26	FY25	FY24	FY23
Cash conversion cycle (Days)	Milestone Gears Ltd.	199	223	173	132
	Bharat Forge Ltd.	N/a	N/a	N/a	N/a
	Sona BLW Precision Forgings Ltd.	N/a	N/a	N/a	N/a
	Happy Forgings Ltd.	N/a	N/a	N/a	N/a
	Ramkrishna Forgings Ltd.	N/a	N/a	N/a	N/a
	Shanthi Gears Ltd.	N/a	N/a	N/a	N/a

	Company	Q1 FY26				
		Tractors	CE	EV	Locomotives	Windmill & other heavy industries
Revenue breakdown (end use) (%)	Milestone Gears Ltd.	83.30%	8.39%	5.60%	0.00%	2.71%
	Bharat Forge Ltd.	N/a	NA	N/a	N/a	N/a
	Sona BLW Precision Forgings Ltd.	N/a	NA	N/a	N/a	N/a
	Happy Forgings Ltd.	N/a	NA	N/a	N/a	N/a
	Ramkrishna Forgings Ltd.	N/a	NA	N/a	N/a	N/a
	Shanthi Gears Ltd.	N/a	NA	N/a	N/a	N/a
	Company	FY25				
		Tractors	CE	EV	Locomotives	Windmill & other

						heavy industries
	Milestone Gears Ltd.	82.70%	11.32%	4.08%	0.00%	1.89%
	Bharat Forge Ltd.	N/a	N/a	N/a	N/a	N/a
	Sona BLW Precision Forgings Ltd.	N/a	N/a	N/a	N/a	N/a
	Happy Forgings Ltd.	N/a	N/a	N/a	N/a	N/a
	Ramkrishna Forgings Ltd.	N/a	N/a	N/a	N/a	N/a
	Shanthi Gears Ltd.	N/a	N/a	N/a	N/a	N/a
	Company	**FY24**				
		Tractors	**CE**	**EV**	**Locomotives**	**Windmill & other heavy industries**
	Milestone Gears Ltd.	79.24%	14.03%	5.51%	0.00%	1.22%
	Bharat Forge Ltd.	N/a	N/a	N/a	N/a	N/a
	Sona BLW Precision Forgings Ltd.	N/a	N/a	N/a	N/a	N/a
	Happy Forgings Ltd.	N/a	N/a	N/a	N/a	N/a
	Ramkrishna Forgings Ltd.	N/a	N/a	N/a	N/a	N/a
	Shanthi Gears Ltd.	N/a	N/a	N/a	N/a	N/a
	Company	**FY23**				
		Tractors	**CE**	**EV**	**Locomotives**	**Windmill & other heavy industries**
	Milestone Gears Ltd.	80.35%	10.14%	9.33%	0.00%	0.18%
	Bharat Forge Ltd.	N/a	N/a	N/a	N/a	N/a
	Sona BLW Precision Forgings Ltd.	N/a	N/a	N/a	N/a	N/a
	Happy Forgings Ltd.	N/a	N/a	N/a	N/a	N/a
	Ramkrishna Forgings Ltd.	N/a	N/a	N/a	N/a	N/a
	Shanthi Gears Ltd.	N/a	N/a	N/a	N/a	N/a

Revenue breakdown (domestic) (%)	**Company**	**Q1 FY26**	**FY25**	**FY24**	**FY23**
	Milestone Gears Ltd.	89.06%	90.57%	87.75%	84.94%
	Bharat Forge Ltd.	45.99%	43.70%	42.01%	41.13%
	Sona BLW Precision Forgings Ltd.	37.00%	29.00%	28.00%	29.00%
	Happy Forgings Ltd.	84.00%	82.00%	81.00%	87.00%
	Ramkrishna Forgings Ltd.	70.00%	58.40%	57.51%	58.50%
	Shanthi Gears Ltd.	N/a	90.20%	92.50%	93.00%

Revenue breakdown	**Company**	**Q1 FY26**	**FY25**	**FY24**	**FY23**
	Milestone Gears	10.94%	9.43%	12.25%	15.06%

(exports) (%)	Ltd.				
	Bharat Forge Ltd.	54.01%	56.30%	57.99%	58.87%
	Sona BLW Precision Forgings Ltd.	63.00%	71.00%	72.00%	71.00%
	Happy Forgings Ltd.	16.00%	18.00%	19.00%	13.00%
	Ramkrishna Forgings Ltd.	30.00%	41.60%	42.49%	41.50%
	Shanthi Gears Ltd.	N/a	9.80%	7.50%	7.00%

Notes to Listed Peers

1) All the financials for the industry peers mentioned above are on a consolidated basis(unless called out otherwise in notes)and is sourced from the annual reports, audited financial results and investor presentations as available of the respective company for the relevant year submitted to the Stock Exchanges except for Shanthi Gears Ltd. where all metrics are on a standalone basis. N/a refers to Not Applicable where the financial information is unavailable i.e. not reported by the industry peers in either their annual reports, audited financial results and investor presentations as submitted to the Stock Exchanges.

2) Revenue from Operations (% Change) is calculated as a percentage of Revenue from Operations of the relevant period minus Revenue from Operations of the preceding period, divided by Revenue from Operations of the preceding period.

3) EBITDA Margin is calculated as EBITDA divided by Revenue from Operations for Bharat Forge Ltd, Sona BLW Precision Forgings Ltd, Happy Forgings Ltd, Ramkrishna Forgings Ltd, Shanthi Gears Ltd.

4) PAT Margin refers to PAT divided by Revenue from Operations for Bharat Forge Ltd. Sona BLW Precision Forgings Ltd, Happy Forgings Ltd, Ramkrishna Forgings Ltd, Shanthi Gears Ltd.

5) ROCE% for Ramkrishna Forgings Ltd is a standalone metrics for period ended March 31st 2025.

6) RoNW% for Bharat Forgings Ltd. is a standalone metrics for all periods.

7) Fixed Asset Turnover refers to only manufacturing business for Sona BLW Precision Forgings Ltd. Ramkrishna Forgings Ltd and Sona BLW Precision Forgings Ltd reports the metric as Fixed asset turnover while Happy forgings Ltd reports it as Gross fixed asset turnover.

8) Capital Expenditure for Bharat Forge Ltd. is a standalone metric for all periods.

9) Capital Expenditure % refers to Capital Expenditure / Revenue from Operations for Bharat Forge Ltd .and Sona BLW Precision Forgings Ltd

Notes related to Milestone Gears Ltd.

** RoCE (%), RoNW (%), & Fixed asset turnover are not annualised for the period ended June 30th 2025.*

a) Revenue from Operations means the Revenue from Operations for the year/ period as appearing in the Restated Financial Information.

b) Revenue from Operations (% Change) is calculated as a percentage of Revenue from Operations of the relevant period minus Revenue from Operations of the preceding period, divided by Revenue from Operations of the preceding period multiplied by 100

c) EBITDA represents the restated profit for the year/ period plus total tax expense, finance cost, depreciation and amortization expense.

d) EBITDA Margin(%) is calculated as EBITDA as a percentage of Revenue from Operations.

e) Profit after Tax (PAT) is Restated profit for the year/ period as appearing in the Restated Financial Information.

f) PAT Margin(%) is calculated as PAT as a percentage of Revenue from Operations.

g) Return on Capital Employed(%) is calculated as earnings before interest and taxes("EBIT") divided by capital employed. EBIT is calculated as Restated profit before tax for the period/year plus finance costs. Capital employed being computed as the sum of total equity and current and non-current borrowings, minus intangible assets, intangible assets under development and deferred tax assets.

h) Return on Net Worth (RONW) (%) is calculated as restated profit for the year/ period divided by Net Worth at the end of the period/year.

i) Net Debt to Equity (Times) is calculated as net debt divided by total equity. Net debt is calculated as non-current borrowings plus current borrowings plus non-current lease liabilities plus current lease liabilities minus cash and cash equivalents.

j) Fixed Asset Turnover (Times) is calculated as Revenue from Operations for the period / year divided by average net block of property, plant and equipment and capital work in progress.

k) Cash Conversion Cycle (Days) is calculated as inventory days plus trade receivable days minus trade payable days. Inventory days is calculated as average inventory divided by cost of goods sold ("COGS") multiplied by no. of days in the period / year. Trade receivable days is calculated as average trade receivables divided by Revenue from Operations multiplied by no. of days in the period / year. Trade payable days is calculated as trade payable divided by COGS multiplied by no. of days in the period / year.

l) Revenue breakdown (%) by End Use is calculated as revenue from each end use sector divided by total revenue from sale of products.

m) Revenue breakdown (%) by geography is calculated as revenue from each geography divided by total revenue from sale of products.

n) Capital Expenditure (value) is the aggregate of additions to property, plant and equipment, capital work-in-progress, intangible assets, intangible assets under development and adjustment for movement in capital advances for the period/year.

o) Capital Expenditure (%) is calculated as Capital Expenditure (value) divided by Revenue from Operations for the period/year.

Operational benchmarking

Operational metrics	Milestone Gears Ltd.	Bharat Forge Ltd.	Sona BLW Precision Forgings Ltd.	Happy Forgings Ltd.	Ramkrishna Forgings Ltd.	Shanthi Gears Ltd.
Establishment year	1984	1961	1995	1979	1981	1960
Manufacturing plants (#)	9	18	12	3	11	3
New products developed (#)	307	57	`3	N/a	413	N/a
Forging capacity (MTPA)	35,460	6,36,400	N/a	1,27,000	70,350	N/a
Forging utilisation (%)	94.20%	N/a	N/a	57.00%	N/a	N/a
Machining capacity (# of parts)	49,28,400	N/a	N/a	N/a	N/a	N/a
Machining utilisation (%)	68.10%	N/a	N/a	N/a	N/a	N/a
Total no. of employees (#)	1,417	4,354	5,019	3,171	2,776	503

Notes:

- *N/a means not available*
- *Manufacturing plants refer to the number of manufacturing facilities that the company owns at the end of the financial year, ending March 31st, 2025*
- *New products deployed refers to the number of new products that the company has launched at the end of the*

financial year, ending March 31st, 2025

- *Forging capacity is the total forging capacity of the company at the end of the financial year, ending March 31st, 2025*

- *Forging utilisation is the % of forging capacity utilised as at the end of the financial year ending March 31st, 2025*

- *Machining capacity is the total machining capacity of the company as of the end of the financial year, ending March 31st, 2025*

- *Machining utilisation is the % of machining capacity utilised as at the end of the financial year ending March 31st, 2025*

- *Number of employees refers to the total strength of employees employed as at the end of, and for the financial year ending March 31st, 2025*

- Total no. of employees for Milestone Gears Ltd. as at the end of the period ending June 30th, 2025

Threats & challenges faced by gears & component industry

- **Stringent regulatory framework**: Stringent regulatory frameworks, including OEM-mandated standards such as IATF 16949, ISO 14001 & PPAP, expose precision component manufacturers to operational & financial risks. Non-compliance, audit delays, or failure to meet certification requirements can lead to order rejection, increased costs, & potential loss of credibility with leading OEMs.

- **Intensified competition from global players**: Global suppliers with integrated forging, machining, and assembly capabilities pose a major threat to Indian component manufacturers. Trade policies such as the UK-India FTA could further intensify this by increasing imports of high-precision components & thereby eroding domestic players' market share.

- **Limited customer acquisition**: Most key OEMs maintain stringent quality standards & long-term contracts with selected suppliers, restricting opportunities for new vendors. This limits the ability of component manufacturers to diversify their client base, creating dependency on a few OEMs & exposing them to potential bottlenecks & growth constraints.

- **Frequent technological upgradations**: Rapid evolution of Industry 5.0 standards in precision manufacturing requires continuous upgrades in CNC machining, gear grinding & digital inspection. Ensuring compliance with the high-precision requirements of automotive, off-highway & agri-equipment OEMs entails substantial capital & workforce upskilling, making frequent technological upgrades a persistent operational challenge for manufacturers.

Such operational & regulatory challenges represent the key threats to the Indian precision gears & components industry.

The team at 1Lattice

appreciates your time and support

THANK YOU

Enabling better decisions.

Delhi NCR | Mumbai | Bengaluru | UAE | KSA | Singapore

Abhishek Maiti, Director
1Lattice