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Issue no. 68



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What's

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Olectra's Roadmap | Deepening E-Bus Leadership and Building E-Truck Portfolio



Mahesh Babu,
Managing Director
Olectra Greentech

In Aug 2026, **Olectra became the first Indian OEM to deploy 4,000 Electric Buses.** Mahesh Babu, Managing Director of Olectra Greentech, discusses what it will take to scale to the next phase of growth and building trucks as a second pillar of growth for the company.

What's the realistic timeline for Olectra to reach 8,000 EV deliveries, and what needs to go right to get there?

Crossing 4,000 electric buses is an important milestone for Olectra, but we see it as a starting point for the next phase of growth. We believe reaching 8,000 buses is achievable over the next 18 to 24 months, subject to market absorption and execution.

The key is not just manufacturing capacity. It is also about **external factors** such as timely depot and charging infrastructure readiness, stable supply chains, and consistent customer execution.

Our manufacturing facility currently has a **capacity of 2,500 vehicles per shift** and can scale up to around 5,000 vehicles with two shifts. We are therefore building capacity ahead of demand, while remaining disciplined about scaling production in line with actual market requirements.



Olectra's 4,000th electric bus was symbolically handed over to Hon'ble CM and Dy. CM of Himachal Pradesh during the flag-off of 297 new buses inducted into the HRTC fleet.

You flagged shipping availability and rising polymer/crude oil derivative costs as key supply-side challenges. Have these pressures eased, and can they affect your delivery timelines for this FY?

The supply chain environment has improved in some areas, but it is not completely normal yet.

Geopolitical disruptions have affected shipping availability, while materials such as plastics, resins and polymers continue to see supply and cost pressures because of their linkage to crude oil and fuel derivatives.

We have been actively working with suppliers, increasing localisation and strengthening our supply chain to reduce these risks. **Our FY27 plan is to deliver around 2,500 vehicles**, with quarter-on-quarter production growth. We are confident in our manufacturing capability, although external factors such as geopolitics, shipping and component availability remain variables that we continue to monitor closely.



Please detail Olectra's current manufacturing footprint and the new upcoming plant—including an estimated start timeline and the capacity it will add.

Our key electric vehicle manufacturing hub is the 150-acre greenfield facility at Seetharampur, Hyderabad. Phase I became commercially operational on December 31, 2025, with an annual capacity of 2,500 electric buses on a single shift. With two shifts, the facility can operate around 5,000 vehicles annually and can scale further as the market grows.

In parallel, we are setting up a **dedicated manufacturing facility for electric trucks with an annual capacity of around 2,500 vehicles**. The project is already underway and is expected to become operational within ~12 months. It will support our next generation of heavy electric commercial vehicles, including our own truck platform.

The broader manufacturing strategy is to create an integrated ecosystem covering electric buses, trucks, battery pack assembly and localisation of critical components.

Over the next two years, **we have indicated an investment of around ₹450 crore towards new product development**. This is not limited to one technology. It will support new bus platforms, trucks, battery systems, software and associated testing and engineering capabilities.

What would you point to as Olectra's most meaningful contribution to localisation and domestic manufacturing so far?

Our most meaningful contribution to localization is the **development of our next-generation vehicle platforms across both electric buses and trucks**. These platforms are being designed with a strong focus on domestic manufacturing and localization. Except for battery cells, we expect all major components and systems to be completely localized.

Our new manufacturing facility will play a key role in building these next-generation platforms at scale. This will not only strengthen our domestic manufacturing capabilities but also help develop a deeper local supplier ecosystem and reduce dependence on imports over time.

The next major step is battery localisation. Battery cells and certain battery technologies remain globally concentrated, but we are working towards local battery pack assembly and deeper localisation of the vehicle architecture. Our objective is to take localisation beyond the current level and create a more resilient domestic EV value chain.

Beyond the 9-meter, 12-meter buses and truck platforms, what new products are currently in the pipeline? How serious is the consideration of exploring LMVs and adjacent segments?

Our immediate focus remains on buses and heavy commercial vehicles. We are developing next generation 9 metre and 12 metre bus platforms, along with our own electric truck platform. **The next generation bus platform is expected to be launched in Q3 FY27, while our own truck platform is targeted for launch in Q4 FY27.** We are also working on an electric truck platform, which is currently at various stages of development and testing.

As far as **LMVs are concerned, we are evaluating the opportunity**, but it is not an immediate strategic priority for Olectra. Our near-term focus is on segments where we have a strong understanding of customers, operating conditions and the commercial vehicle ecosystem. We would enter adjacent categories only where we see a clear opportunity and where we can bring a differentiated product to the market.

Where do you see Olectra's biggest opportunity over the next 3-5 years — deepening in buses and trucks domestically, new vehicle categories, or export?

Our biggest opportunity over the next three to five years is to build a strong electric commercial vehicle portfolio, led by buses and heavy commercial trucks. We see significant headroom for electrification across both public transportation and freight.

Our growth priorities are clear: deepen our leadership in buses, build trucks as our second growth pillar, expand selectively into adjacent categories, and focus our presence in international markets.

Buses will remain a core growth engine, while electric trucks will be an important second growth pillar. At the same time, we are evaluating adjacent categories selectively and looking at international markets as an important part of our growth strategy.

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Burn Test for Li-B applications⁴

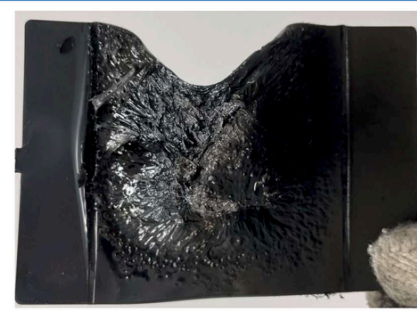
FR PC/ABS



XYRON™ 540Z



XYRON™ 443Z



Burn temp: 850°C
Burn time: 0 min 58 secs
Burn through: Yes
Drip: No

Burn temp: 850°C
Burn time: 2 min 19 secs
Burn through: Yes
Drip: No

Burn temp: 850°C
Burn time: 2 min 58 secs
Burn through: Yes
Drip: No

Burn test method:
Angle of flame: 20°, Thickness: 3 mm
Flame: Blue tip at the center of the plate
Time start: When the fire is turn on
Time stop: When burn through happen

⁵Advantages of XYRON™

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	1m drop test	Impact strength ¹	●	●	●
	Direct/indirect contact of water	Impact strength (after aging) ²	●	●	●
	Thermal shock test	Impact strength (after aging) ³	●	●	●

Note:
1 – Notched Charpy Impact ISO179
2 – Notched Charpy Impact ISO179 after conditioned using Internal Method: -20°C to 85°C/85%RH for 10 cycles.
3 – Notched Charpy Impact ISO179 after conditioned using AIS-156 – Thermal shock: -40°C to 80°C for 10 cycles.
4 – Asahi Kasei Method
5 – Result shown are estimates comparison conducted by Asahi Kasei

● Excellent
● Good

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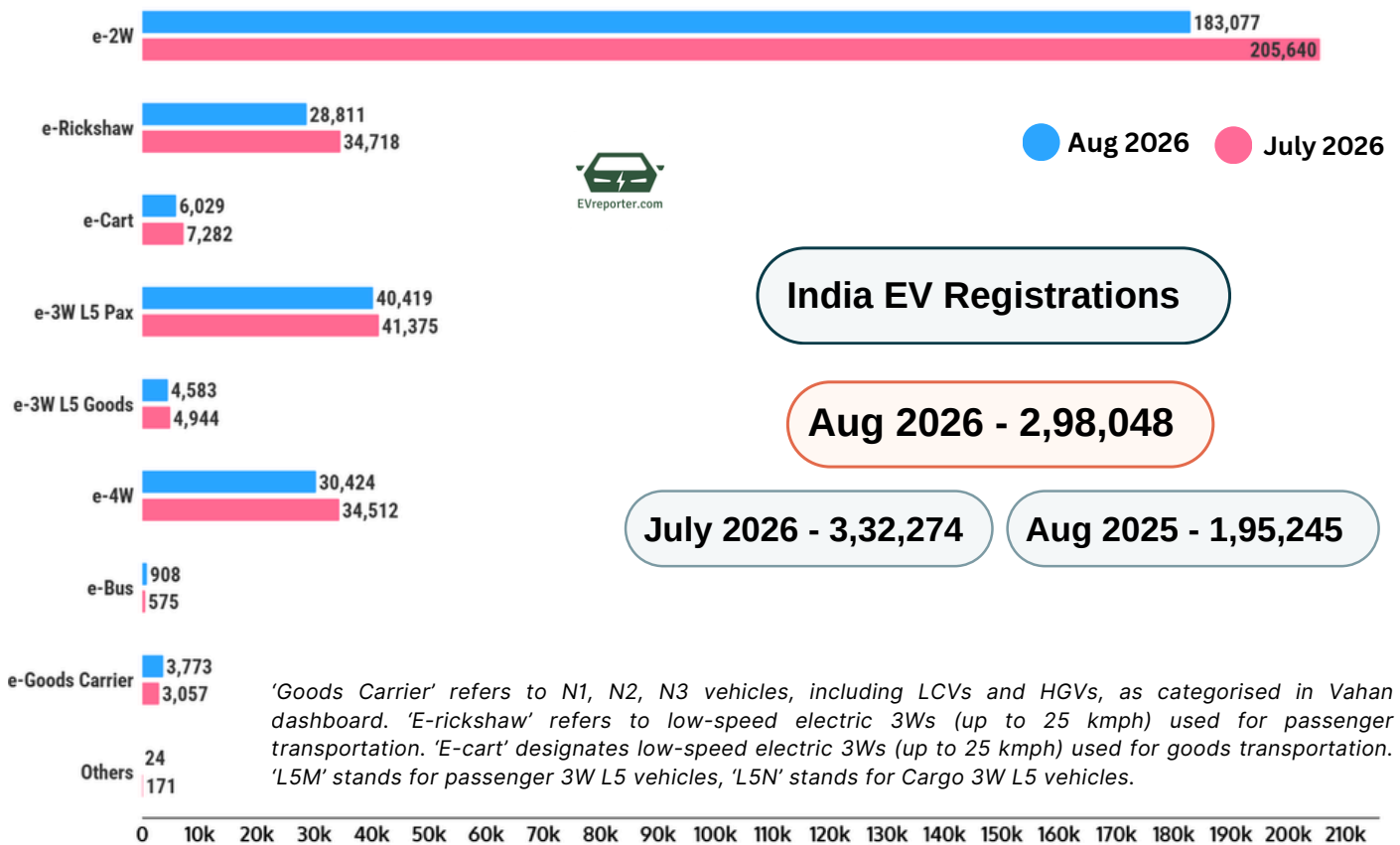
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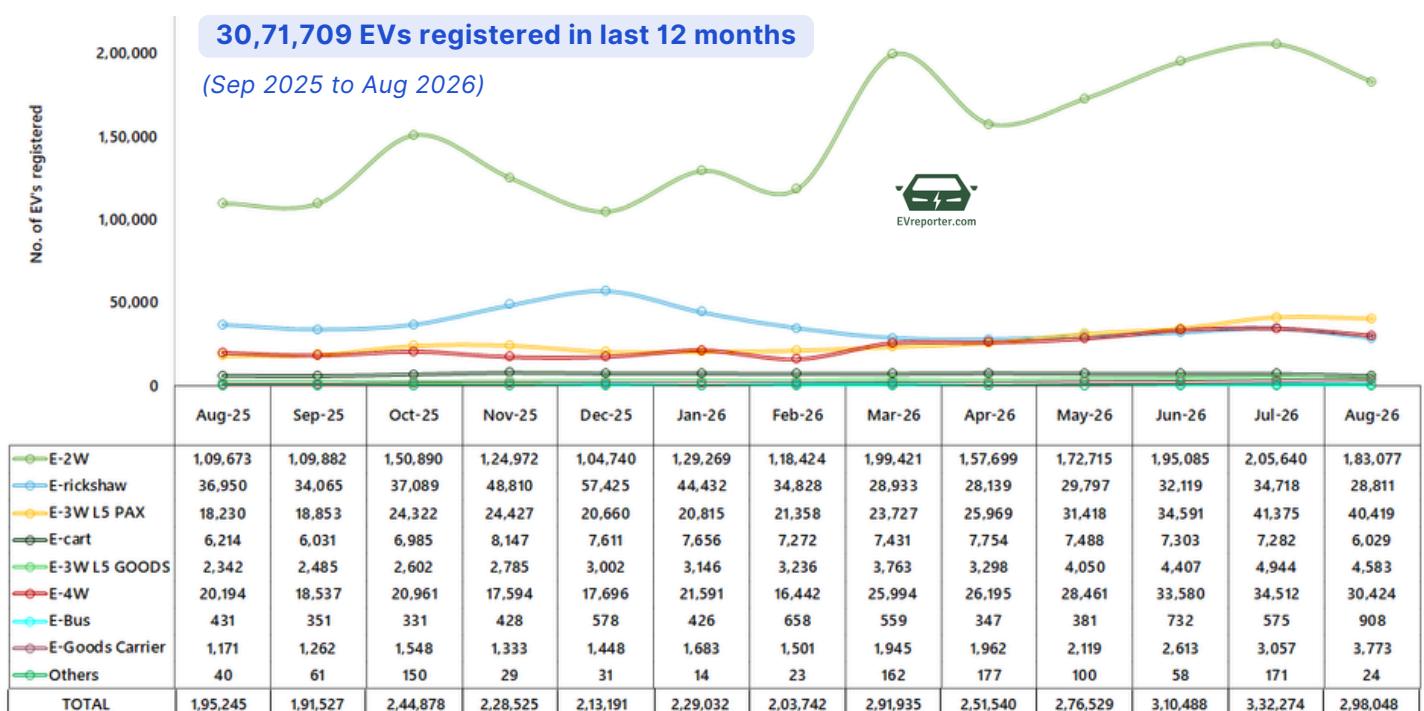
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Category-wise India EV Sales, Aug 2026

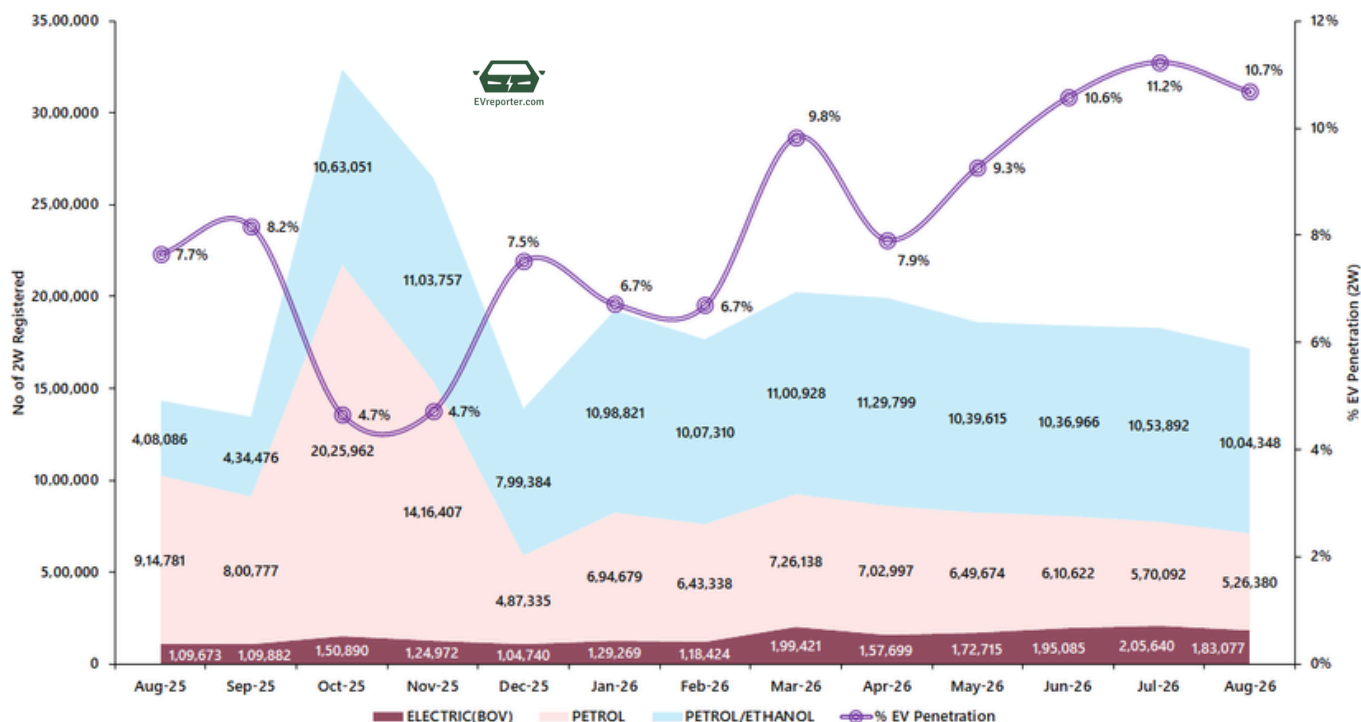


EV Sales Trend from Aug 2025 to Aug 2026

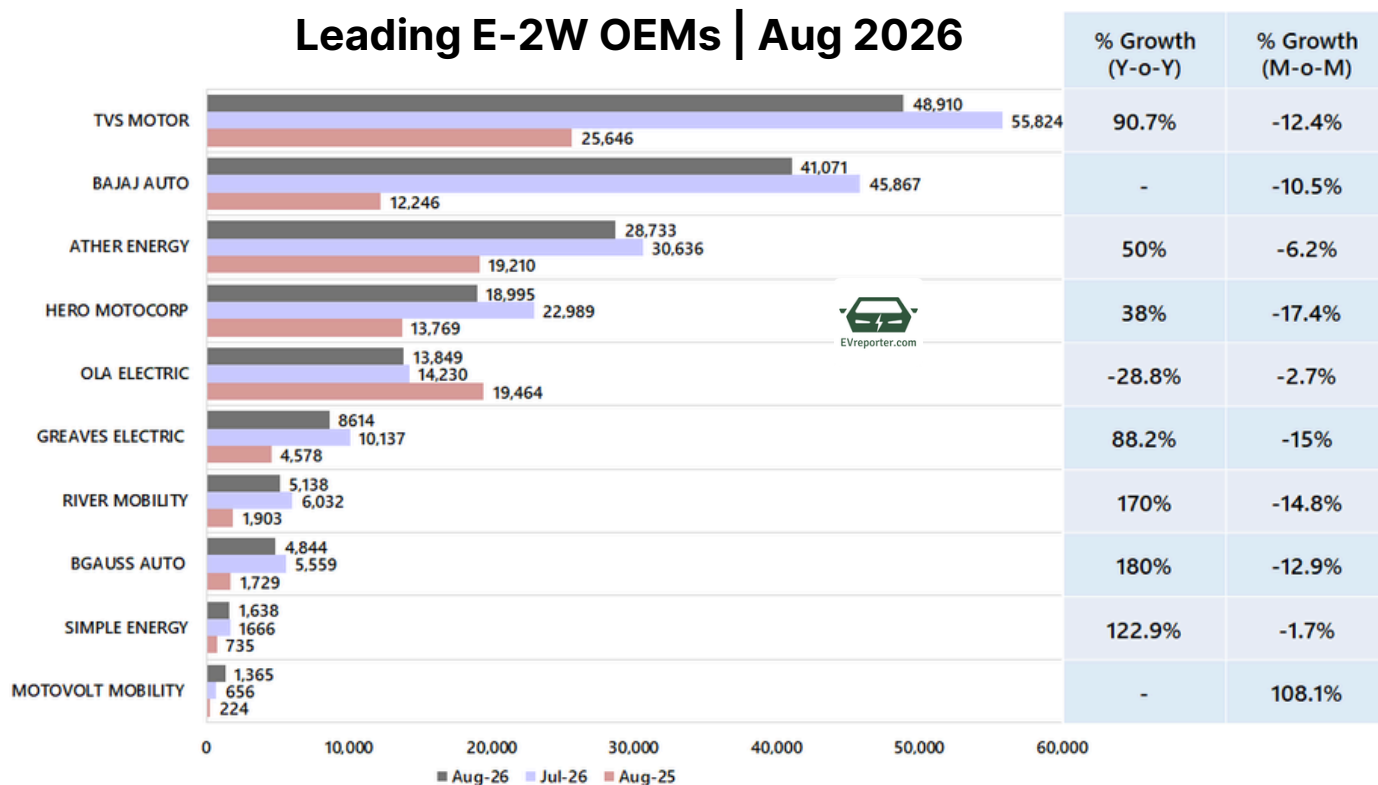


Source: Vahan Dashboard as of Sep 2, 2026. Low speed e-2W sales data not included.

Fuel-wise 2W Sales Trend, Aug 2025 - Aug 2026



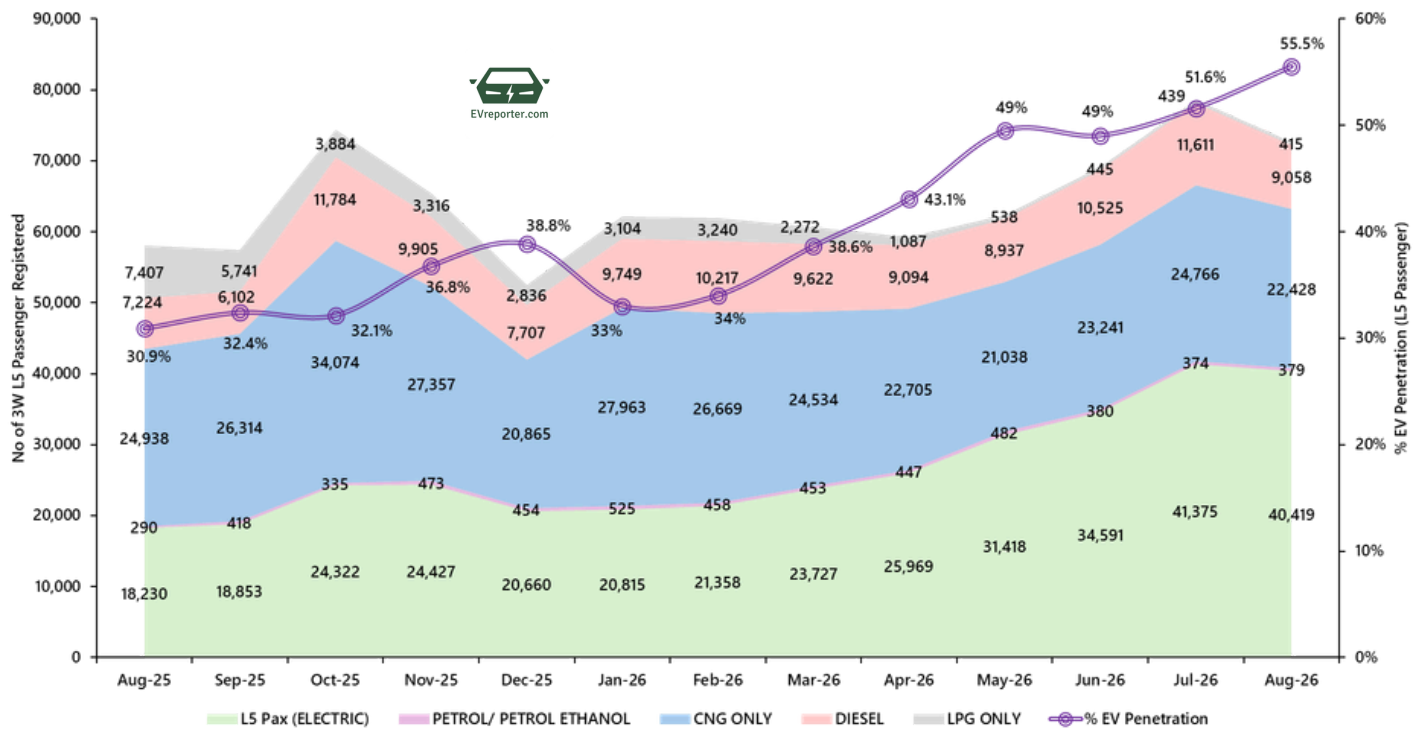
Leading E-2W OEMs | Aug 2026



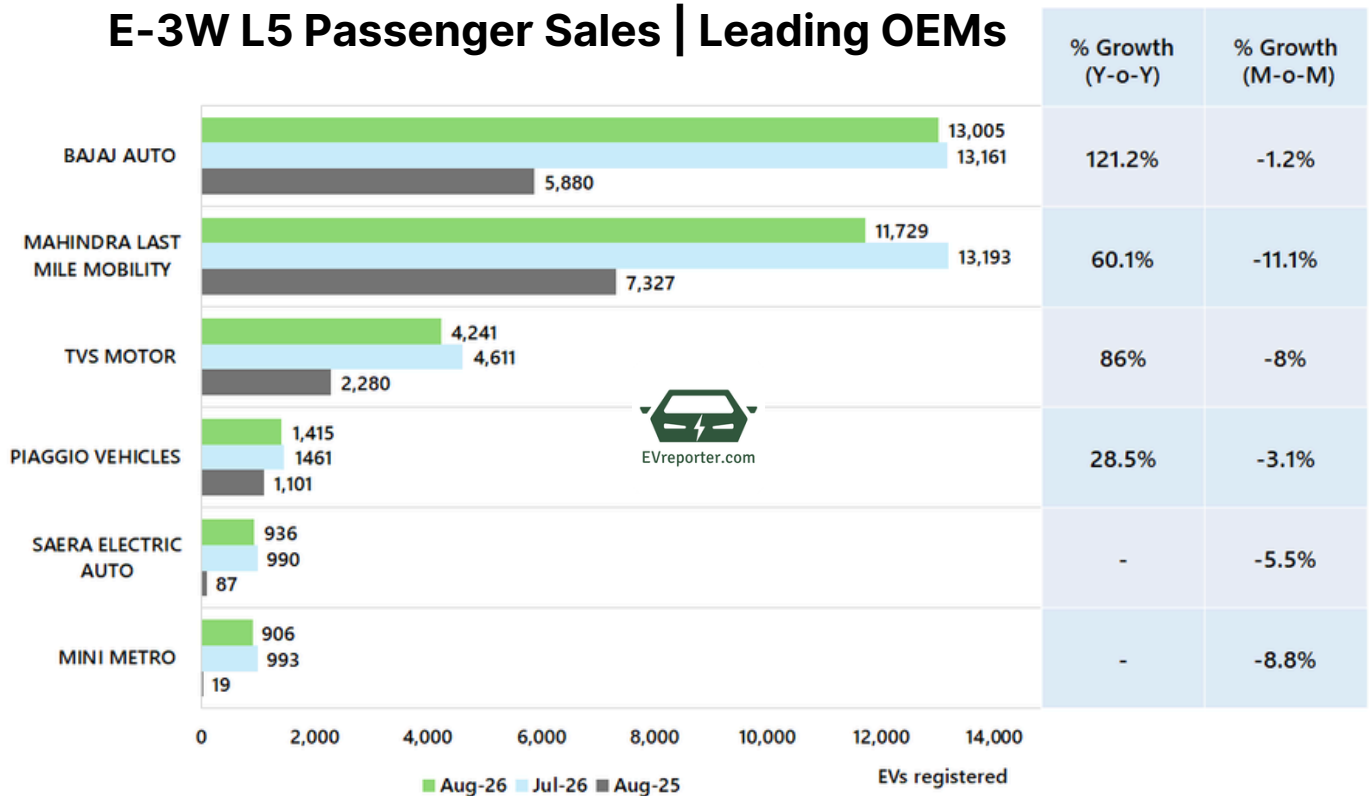
Source: Vahan Dashboard as of Sep 2, 2026. PAN India Data. Low speed e-2W sales data not included.

For deeper EV sale trends - state-wise, city-wise (70 cities), Top performing RTO data and OEM-wise performance, check out the [EVreporter Data Portal](#) here.

Fuel-wise 3W L5 Passenger Sales Trend | Aug 2025 - Aug 2026



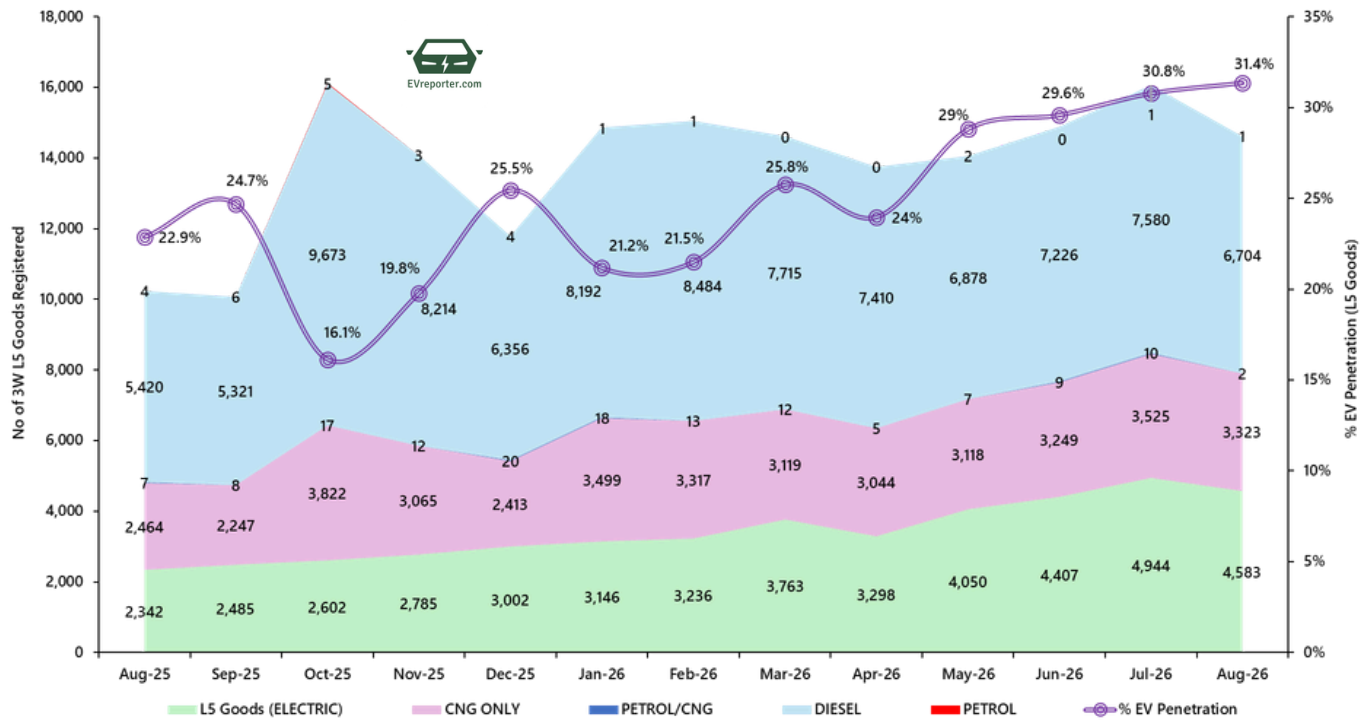
E-3W L5 Passenger Sales | Leading OEMs



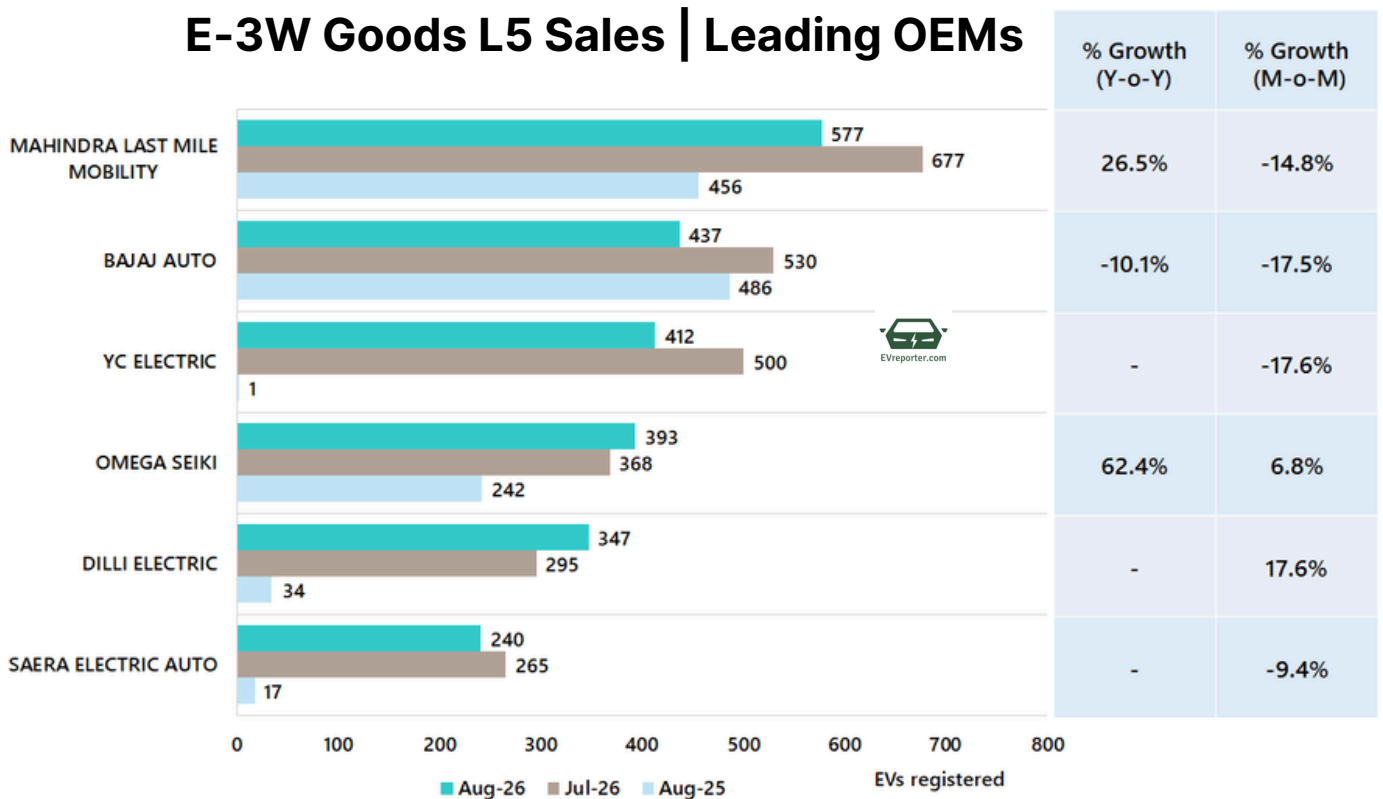
Source: Vahan Dashboard as of Sep 2, 2026. PAN India Data

For deeper EV sale trends - state-wise, city-wise (70 cities), Top performing RTO data and OEM-wise performance, check out the [EVreporter Data Portal here](#).

Fuel-wise 3W L5 Goods Sales Trend | Aug 2025 - Aug 2026



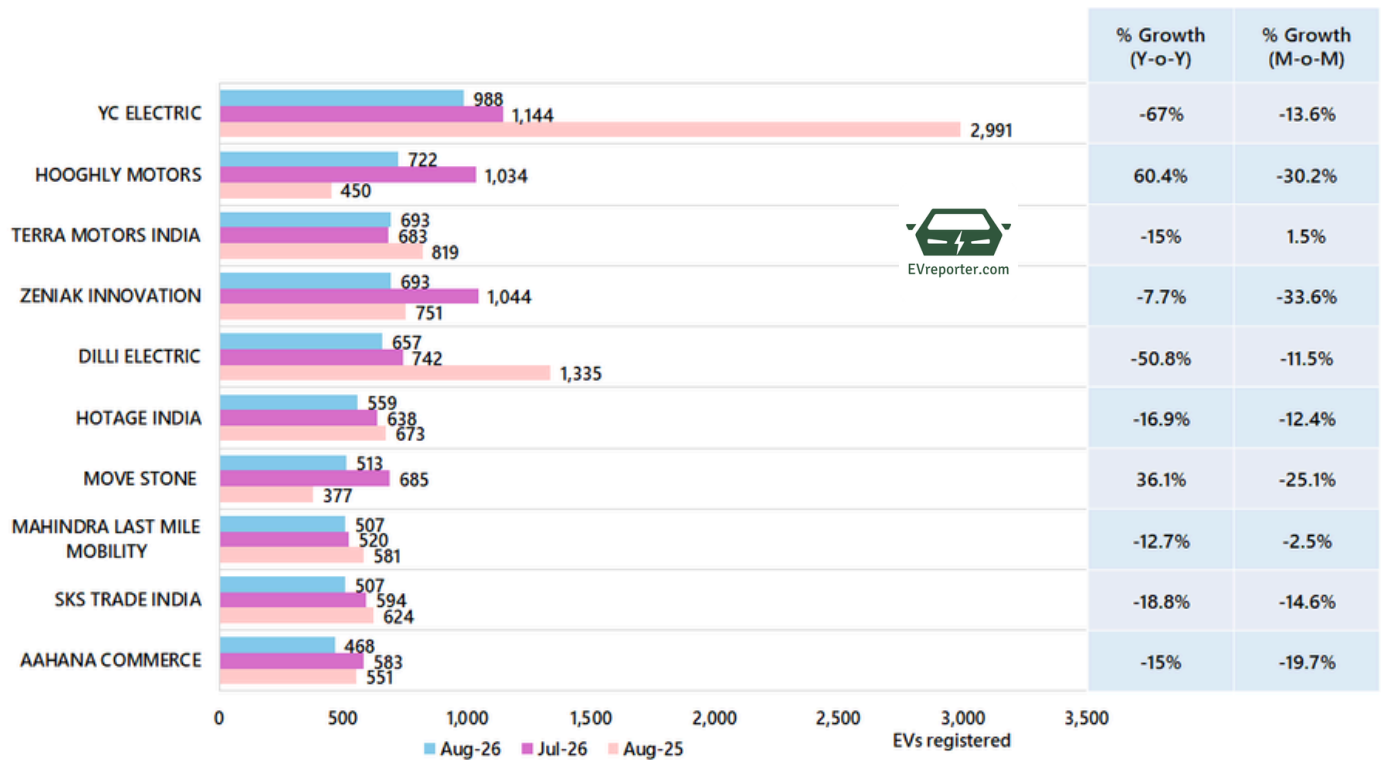
E-3W Goods L5 Sales | Leading OEMs



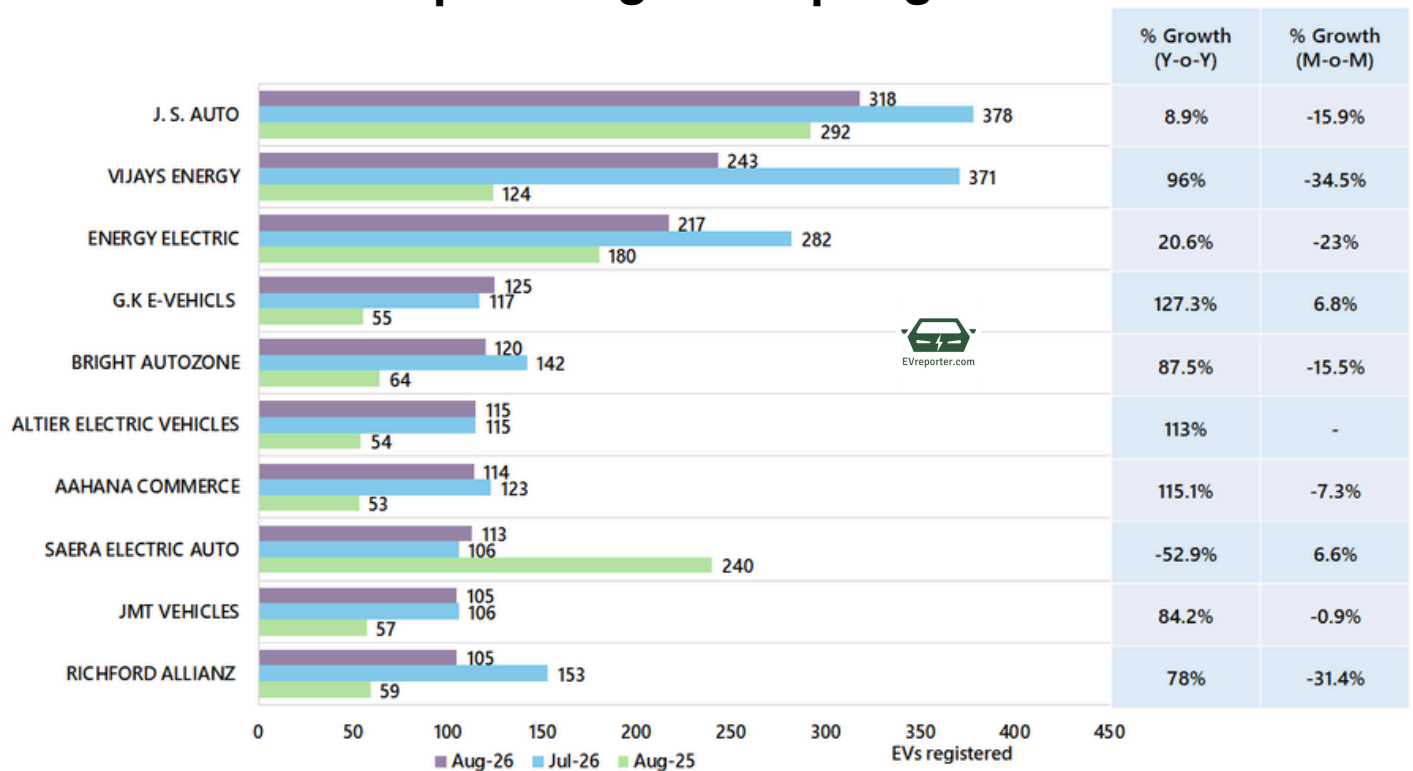
Source: Vahan Dashboard as of Sep 2, 2026. PAN India Data

For deeper EV sale trends - state-wise, city-wise (70 cities), Top performing RTO data and OEM-wise performance, check out the [EVreporter Data Portal here](#).

E-rickshaw Sales | Leading OEMs | Aug 2026



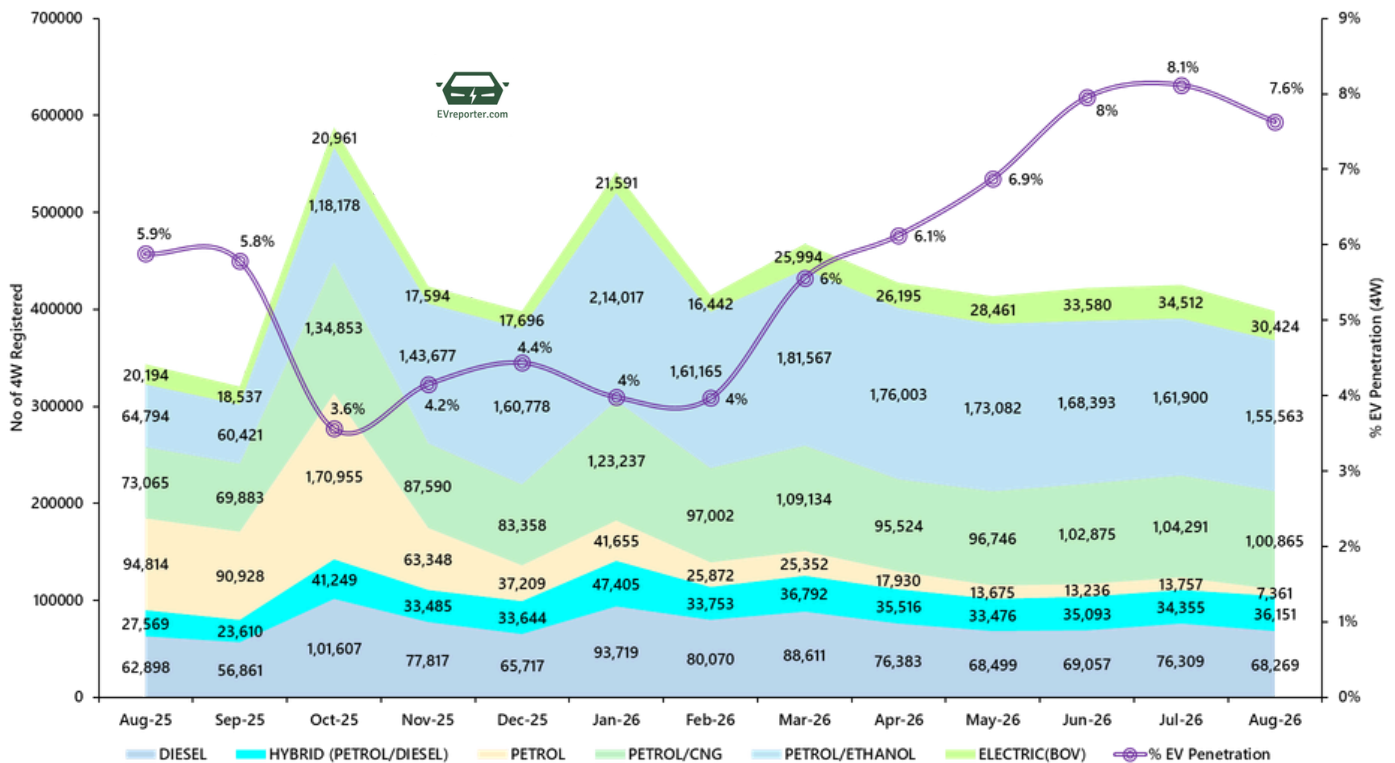
E-cart Sales | Leading OEMs | Aug 2026



Source: Vahan Dashboard as of Sep 2, 2026.

For deeper EV sale trends - state-wise, city-wise (70 cities), Top performing RTO data and OEM-wise performance, check out the [EVreporter Data Portal here](#).

Fuel-wise Car Sales Trend | Aug 2025 - Aug 2026



Electric Car Sales | Leading OEMs | Aug 2026

S No.	Makers	Aug-26	Jul-26	Difference	% Change	Market Share Aug-26
1	TATA MOTORS	13,074	14,361	-1,287	-9%	43%
2	MAHINDRA & MAHINDRA	6,409	8,089	-1,680	-20.8%	21.1%
3	JSW MG MOTOR INDIA	4,602	5,938	-1,336	-22.5%	15.1%
4	VINFAST AUTO INDIA	2,198	1,531	667	43.6%	7.2%
5	MARUTI SUZUKI INDIA	1,405	1,665	-260	-15.6%	4.6%
6	HYUNDAI MOTOR INDIA	802	594	208	35%	2.6%
7	KIA INDIA	640	606	34	5.6%	2.1%
8	BYD INDIA	542	803	-261	-32.5%	1.8%
9	BMW INDIA	273	395	-122	-31%	0.9%
10	TOYOTA KIRLOSKAR	161	124	37	29.8%	0.5%
11	MERCEDES-BENZ INDIA	113	175	-62	-35.4%	0.4%
12	TESLA INDIA MOTORS	111	116	-5	-4.3%	0.4%
13	STELLANTIS AUTOMOBILES	44	53	-9	-17%	0.1%
14	OTHERS	50	62	-12	-19.4%	0.2%
	TOTAL	30,424	34,512	-4,088	-12%	100%

Source: Vahan Dashboard as of Sep 2, 2026.

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OEM wise Electric Bus Sales | Aug 2026

S No.	Makers			Aug-26	Jul-26	Difference	% Change	Market Share Aug-26
1	OLECTRA GREENTECH			315	132	183	138.6%	34.7%
2	JBM ELECTRIC VEHICLES			160	118	42	35.6%	17.6%
3	PINNACLE MOBILITY			155	52	103	198.1%	17.1%
4	SWITCH MOBILITY			146	53	93	175.5%	16.1%
5	PMI ELECTRO MOBILITY			54	143	-89	-62.2%	5.9%
6	VE COMMERCIAL VEHICLES			51	41	10	24.4%	5.6%
7	AEROEAGLE AUTOMOBILES			8	24	-16	-66.7%	0.9%
8	VEERA VIDYUTH VAHANA			8	0	8	-	0.9%
9	OTHERS			11	12	-1	-8.3%	1.2%
	TOTAL			908	575	333	57.9%	100%

OEM wise E-Goods Carrier Sales | Aug 2026

S No.	Makers			Aug-26	Jul-26	Difference	% Change	Market Share Aug-26
1	TATA MOTORS			1,410	1,338	72	5.4%	37.4%
2	EULER MOTORS			849	787	62	7.9%	22.5%
3	SANY HEAVY INDUSTRY INDIA			605	43	562	-	16%
4	MAHINDRA LAST MILE MOBILITY			360	376	-16	-4.3%	9.5%
5	IPL TECH ELECTRIC			174	59	115	194.9%	4.6%
6	SWITCH MOBILITY AUTOMOTIVE			132	137	-5	-3.6%	3.5%
7	TIVOLT ELECTRIC VEHICLES			122	148	-26	-17.6%	3.2%
8	VE COMMERCIAL VEHICLES			71	77	-6	-7.8%	1.9%
9	ENERGY IN MOTION			33	37	-4	-11%	0.9%
10	OMEGA SEIKI			8	1	7	-	0.2%
11	OTHERS			9	54	-45	-83.3%	0.2%
	TOTAL			3,773	3,057	716	23.4%	100%

'Goods Carrier' refers to N1, N2, N3 cargo vehicles, including LCVs and HGVs, as categorised in Vahan dashboard.

Source: Vahan Dashboard as of Sep 2, 2026.



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EV Penetration for Different Vehicle Category Sales in India

Category 	Aug-26	Jul-26	Aug-25
2W	10.7%	11.2%	7.7%
3W L5M	55.5%	51.6%	30.9%
3W L5N	31.4%	30.8%	22.9%
4W	7.6%	8.1%	5.9%
Goods Carrier	4.9%	3.6%	1.8%

Source: Vahan Dashboard as of Sep 2, 2026.

'Goods Carrier' refers to N1,N2,N3 cargo vehicles, including LCVs and HGVs, as categorised in Vahan dashboard. 'L5M' stands for passenger 3W L5 vehicles, 'L5N' stands for Cargo 3W L5 vehicles.

ICE vs EV Sales & Penetration Trend

India's EV Sales Trend for Aug 2026 shows a slight decline in monthly sales volume.

Aug 2026 EV penetration for 2Ws dropped to **10.7%**, from **11.2%** in Jul 2026 (highest ever). The L5 Passenger segment recorded its highest-ever EV penetration of **55.5%**.

The Goods Carrier category is gathering pace, with EV penetration rising to **4.9%** from **1.8%** the year before.

Bajaj Auto attributed **over 26%** of its Aug 2W sales to EVs, while EV penetration for **TVS 2Ws** was **13.8%**.

Over 98% of Mahindra Last Mile Mobility's passenger 3W sales were electric. **Over 65%** of TVS Motors' passenger 3W sales were electric.

~80% of JSW MG Motor India's sales in Aug 2026 were EVs.

EV penetration in the car category stood at **22.7%** for Tata Motors, **19.7%+** for BMW India and **~13%** for Mahindra.

WHAT'S NEW?



- ✓ India FY25-26 EV sales & investment report
- ✓ E-2W & 4W Sales Forecast till FY 2030
- ✓ Quarterly EV sales reports
- ✓ Top 70 Cities and Top Performing RTO EV Sales Data

EVREPORTER DATA PORTAL

- ✓ India Q1 FY26-27 EV Sales Report (Coming soon)
- ✓ E-goods carrier (LCVs and HCVs breakup)
- ✓ EV companies Investment Tracker
- ✓ Telangana Data included
- ✓ Break-up of L3M, L3N, L5M, L5N for e-3Ws

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India's Top 2W OEMs | ICE vs EV Sales for Aug 2026

S No.	Maker		Total Sales Aug-26	ICE	EV	% EV
1	HONDA MOTORCYCLE		4,47,160	4,46,284	876	0.2%
2	HERO MOTOCORP		4,13,919	3,94,924	18,995	4.6%
3	TVS MOTOR		3,53,623	3,04,713	48,910	13.8%
4	BAJAJ AUTO		1,57,070	1,15,999	41,071	26.1%
5	SUZUKI MOTORCYCLE INDIA		1,04,152	1,03,485	667	0.04%
6	ROYAL-ENFIELD		94,253	94,217	36	0.04%
7	INDIA YAMAHA MOTOR		62,346	62,178	168	0.3%
8	ATHER ENERGY		28,733	0	28,733	100%
9	OLA ELECTRIC		13,849	0	13,849	100%
10	GREAVES ELECTRIC		8,614	0	8,614	100%

India's Top 3W Pax Auto OEMs | ICE vs EV Sales for Aug 2026

S No.	Maker		Total Sales Aug-26	ICE	EV	% EV
1	BAJAJ AUTO		36,860	23,855	13,005	35.3%
2	MAHINDRA LAST MILE MOBILITY		11,962	233	11,729	98.1%
3	TVS MOTOR		6,504	2,263	4,241	65.2%
4	PIAGGIO VEHICLES		5,770	4,355	1,415	24.5%
5	ATUL AUTO		1,299	1,044	255	19.6%
6	SAERA ELECTRIC AUTO		936	0	936	100%
7	MINI METRO		906	0	906	100%
8	YC ELECTRIC		782	0	782	100%

Source: Vahan Dashboard as of Sep 2, 2026.

India's Top 3W Goods Auto OEMs | ICE vs EV Sales for Aug 2026

S No.	Maker	Total Sales Aug-26	ICE	EV	% EV
1	BAJAJ AUTO	5,355	4,918	437	8.2%
2	PIAGGIO VEHICLES	2,654	2,558	96	3.6%
3	ATUL AUTO	1,345	1,274	71	5.3%
4	MAHINDRA LAST MILE MOBILITY	905	328	577	63.8%
5	TVS MOTOR	636	462	174	27.4%
6	YC ELECTRIC	412	0	412	100%
7	OMEGA SEIKI	393	0	393	100%
8	DILLI ELECTRIC	347	0	347	100%

India's Top 4W OEMs | ICE vs EV Sales for Aug 2026

S No.	Maker	Total Sales Aug-26	ICE	EV	% EV
1	MARUTI SUZUKI INDIA	1,64,845	1,63,440	1,405	0.9%
2	TATA MOTORS	57,559	44,485	13,074	22.7%
3	MAHINDRA & MAHINDRA	49,649	43,240	6,409	12.9%
4	HYUNDAI MOTOR INDIA	46,808	46,006	802	1.7%
5	TOYOTA KIRLOSKAR MOTOR	24,460	24,299	161	0.7%
6	KIA INDIA	23,279	22,639	640	2.7%
7	SKODA AUTO VOLKSWAGEN INDIA	7,387	7,387	0	-
8	JSW MG MOTOR INDIA	5,761	1,159	4,602	79.9%
9	HONDA CARS INDIA	4,943	4,943	0	-
10	RENAULT INDIA	3,264	3,264	0	-
11	NISSAN MOTOR INDIA	2,749	2,749	0	-
12	VINFAST AUTO INDIA	2,198	0	2,198	100%
13	BMW INDIA	1,388	1,115	273	19.7%
14	MERCEDES-BENZ INDIA	1,346	1,233	113	8.4%

Source: Vahan Dashboard as of Sep 2, 2026.

WHAT'S NEW?

EVREPORTER DATA PORTAL

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- ✓ India FY25-26 EV sales & investment report
- ✓ E-2W & 4W Sales Forecast till FY 2030
- ✓ Quarterly EV sales reports
- ✓ Top 70 Cities and Top Performing RTO EV Sales Data

- ✓ India Q1 FY26-27 EV Sales Report (Coming soon)
- ✓ E-goods carrier (LCVs and HCVs breakup) data
- ✓ EV companies Investment Tracker
- ✓ Telangana Data included
- ✓ Break-up of L3M, L3N, L5M, L5N for e-3Ws





Ravi Chawla
MD & CEO
Gulf Oil India Lubricants

Beyond Lubricants | Gulf Oil's ₹225 Crore Electric Vehicle Charging Bet

Gulf Oil India, a top-tier player in the lubricants business, has spent the last few years building a second identity in electric mobility. Through stakes in Tirex Transmission (charger manufacturing), Indra Renewable Technologies (UK-based AC charger maker), and ElectreeFi (charging management software) — the company has committed close to ₹185 crore to the EV charging value chain, with another ₹50 crore earmarked for Tirex in the coming months.

Ravi Chawla, MD and CEO of Gulf Oil India Lubricants, discussed the diversification, how Gulf is positioning Tirex beyond its stronghold in electric buses, and how the EV-specific lubricants market is a slow-building opportunity. Edited excerpts from the conversation:

When Gulf Oil India decided to explore electric mobility, what was your investment thesis, and what made you focus on EV charging specifically?

Gulf is among the top lubricant brands. We work with more than 50 OEMs, and our customers span OEMs, infrastructure players, and the B2C market. Our core business will continue to grow at 2-4% even over the next 20 years, because the ICE ecosystem isn't going anywhere.

EV penetration will continue to grow in India, and this is happening at a fairly rapid pace across vehicle categories. About four to five years ago, we recognized that EV adoption would eat into some lubricant consumption globally. But we also saw an opportunity - we manufacture transmission and EV fluids that go into EVs, and while there's no engine oil demand without an engine, demand for coolants, brake fluids, and greases remains.

We undertook a global study of our major growth markets—Europe and India—to assess opportunities across the mobility value chain.

Through a series of acquisitions, we are positioning Gulf within the broader EV mobility value chain, anticipating that lubricant growth may slow in certain segments after 20-25 years.

- We identified and invested in Indra, a UK-based company that ranks among the top 5 AC charger makers globally. It develops V2G-capable advanced AC chargers, which we plan to bring to India and localize.
- We also moved into charging software, taking a 25% stake in ElectreeFi.
- We invested in Tirex (an AC and DC charger manufacturer for OEMs), where we now hold over a 65% stake. Tirex has crossed ₹100 crore in turnover, and we're aiming for ₹300-400 crore in revenue over the next 3-4 years.

Cumulative investment of ~₹225 crore across three companies

■ Tirex Transmission

~₹140 crore investment,
65.18% stake.

To invest an additional
₹50 crore soon

■ Indra Renewable

~₹30 crore investment
~7.5% stake

■ ElectreeFi

~₹15 crore investment
~26% stake

What kind of companies are you looking to evaluate further to expand your presence in the EV ecosystem?

Our goal is to grow the businesses we already have. We want to expand Tirex and ElectreeFi, and bring Indra's technology localized to India.

While we've explored battery swapping, the space isn't yet clear on policy and OEM adoption. We're open to evaluate new areas for fresh investments, but we do not want to get into cash-burn businesses.

And the focus of Tirex remains on the bus and commercial EV fleets?

Interestingly, Tirex is expanding its customer base. We had earlier segmented it into public utilities, CPOs, and bus OEMs, and now we're seeing other retail segments emerging too, like housing societies. We've also started supplying AC chargers to OEMs — **JSW MG Motors** and **VinFast**.

We believe 1 out of 3 e-buses is using a Tirex charger.

We are now looking at segments like CPOs and installation. We have also done work for **Mahindra Group**, supplying fast chargers at some locations and helping them set up some of this charging infrastructure.





We see an opportunity in emerging segments like installation — residential and commercial. Since we already have 50-plus OEMs buying lubricants from us, we can tap into that relationship as their charging needs emerge. Beyond installation and management, we are creating new products for payment gateways, aggregation, and roaming across charging networks — areas ElectreeFi is working on.

Synergy with infrastructure business - We supply lubricants to major infrastructure companies, including Larsen & Toubro and others building out India's infrastructure. If they want to set up charging facilities at a site, we are well placed to support that. We already have a few proofs of concept underway with construction OEMs looking at chargers for captive electric movement of materials.

Tirex is expanding its facilities in Ahmedabad — we are taking on a new site there. Currently, capacity stands at around **1,800 DC chargers** and **50,000 AC chargers**. Over the next couple of months, we plan to scale this up significantly — nearly doubling or tripling DC charger capacity and scaling AC charger capacity by 3 to 5 times. We are focused on reliability testing and making our processes transparent for OEMs.

Indra and ElectreeFi — what kind of market presence do these have at the moment, and what are your plans to support the expansion of these businesses?

- ElectreeFi is a software-as-a-service provider. They provide a charging management system (CMS) and additional aggregation platforms to OEMs—including Mahindra & Hero, to name a few. They're also deploying systems for residential welfare societies and are in talks to provide aggregation, charger roaming, and payment gateways. We want to see ElectreeFi evolve beyond CMS and aggregation, and develop solutions alongside Tirex and other players to work with more OEMs.
- Indra, on the other hand, mainly supplies to the UK market. We are looking at de-spec'ing and manufacturing their product in India. Indra is working closely with ElectreeFi and Tirex to bring their technology to India.

EVs require transmission fluids or coolants, and you've already launched EV-specific products that are being pre-filled at OEM factories right now. How do you see the replacement market for EV-specific products developing?

It's very nascent. Since vehicles now come with these transmission fluids and other fluids pre-filled, the scope for top-ups or replacement is quite small. We are seeing networks acquire some of this stock, since vehicles do come in for top-up or replacement, but it's a small market for us at present.

We have made inroads with some OEMs, and **we have started working with a major car OEM** (to be announced soon). It's a small volume to start with, but we're also evolving the product, particularly around thermal management and the electro-properties of the lubricant. The products are ready, and we continue to develop them further.

Where a normal ICE vehicle might use 100 liters, an EV would use only around 15 liters of fluids. So, **lubricant usage per vehicle is much lower compared to a conventional ICE vehicle**. Of that 15 liters, replacement might happen at around 10-12%, so the overall increase in consumption — across regular lubricants, coolants, and transmission fluids — is likely to be just 1-2%.

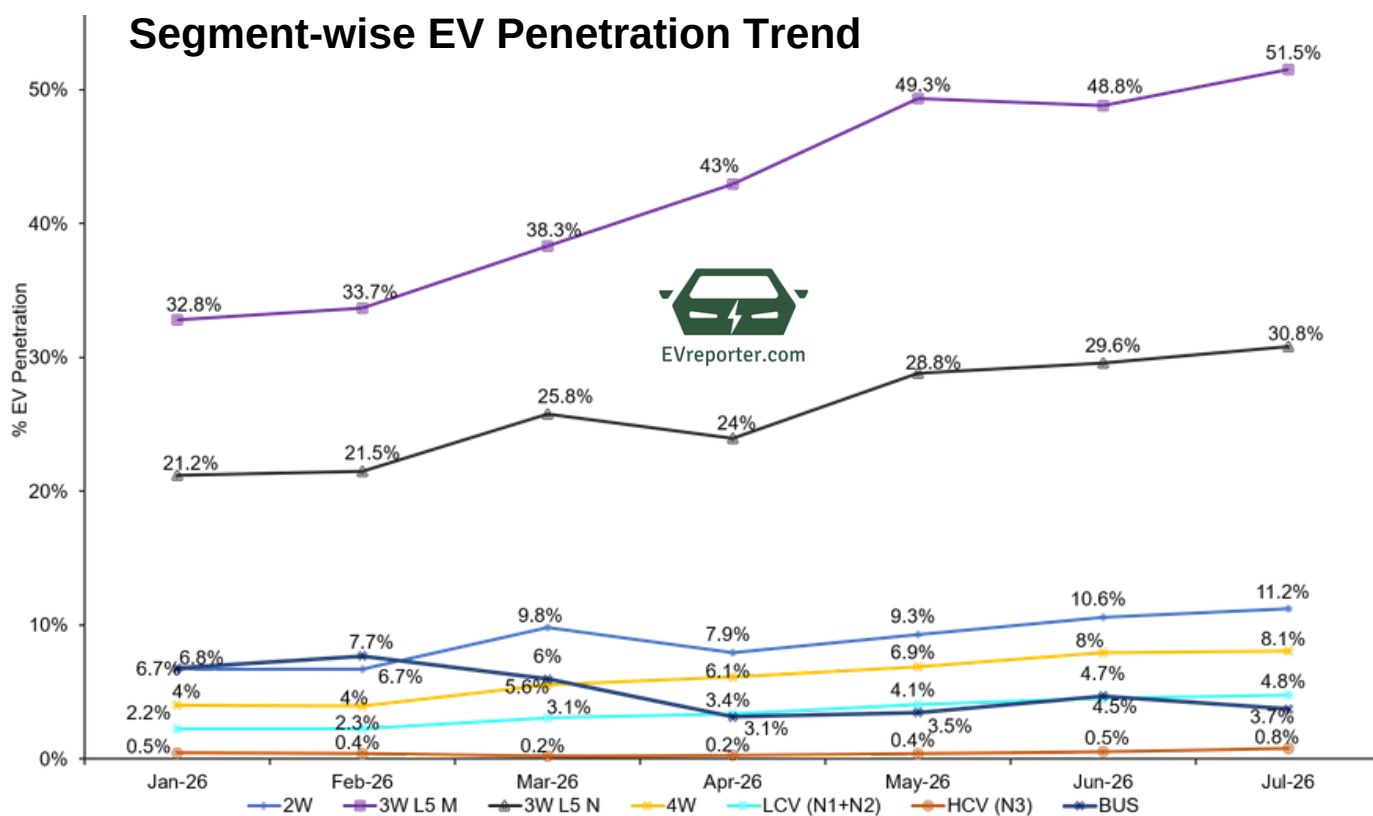


*EVs matter for emissions and the environment, and they matter for Gulf as well. We are a trusted brand in lubricants — among the top two in the industry — and **we see a natural extension from chargers today to EV fluids, charging hardware, and software platforms tomorrow**. We are well placed to provide these solutions to our customers.*

In 2026, India Records Increasing EV Penetration Across Vehicle Segments

18,95,803 EVs Registered in First 7 Months of CY2026

- From January to July 2026, India recorded 11.78 lakh e-2W sales, representing 8.9% EV penetration in the segment with an upward month on month trend.
- Among three-wheelers, L5 Pax(M) achieved 42.9% EV penetration with 1.99 lakh electric units, while L5 Cargo(N) reached 26% EV penetration.
- EV penetration stood at 6% for cars, 4.8% for buses, 3.4% for LCVs, and 0.4% for HCVs during this seven-month period.



Source: EVreporter Intelligence, Data from Vahan dashboard. Low-speed 2W data not included.

E-2W dominates EV sales with 62.14% share from Jan to Jul 2026, while e-3W L5M accounted for 10.51% and e-4W made up 9.86% of total EV sales.

For deeper EV sales trends - state-wise, city-wise (70 cities), Top performing RTO data and OEM-wise performance, check out the [EVreporter Data Portal here](#).

Leading e-2W OEMs | Sales Trend | Jan 2026 - Jul 2026

S No	MAKER	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Total
1	TVS MOTOR	36,137	33,498	51,635	40,121	43,029	47,437	55,774	3,07,631
2	BAJAJ AUTO	26,575	26,344	47,752	34,600	39,542	43,527	45,829	2,64,169
3	ATHER ENERGY	23,099	21,359	36,614	28,637	28,585	31,459	30,592	2,00,345
4	HERO MOTOCORP	13,866	12,975	22,201	15,940	19,220	21,897	22,975	1,29,074
5	OLA ELECTRIC	7,810	4,176	10,285	12,391	15,291	16,266	14,224	80,443
6	GREAVES ELECTRIC	5,420	4,761	7,979	7,011	7,705	10,941	10,134	53,951
7	RIVER MOBILITY	2,856	2,480	4,285	3,730	3,800	4,452	6,013	27,616
8	BGAUSS AUTO	2,539	2,723	3,773	3,230	3,300	3,975	5,560	25,100
9	SIMPLE ENERGY	564	805	1,780	1,259	1,325	1,378	1,661	8,772
10	E-SPRINTO	2,033	1,176	1,510	680	955	1,878	445	8,677
	OTHERS	8,370	8,127	11,605	10,097	9,947	11,841	12,252	72,239
	TOTAL	1,29,269	1,18,424	1,99,419	1,57,696	1,72,699	1,95,051	2,05,459	11,78,017

Leading e-3W L5 Pax OEMs | Sales Trend | Jan 2026 - Jul 2026

S No	Maker	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Total
1	BAJAJ AUTO	7,993	8,228	8,461	9,250	11,609	10,947	13,162	69,650
2	MAHINDRA LMM	6,313	6,806	8,319	9,197	10,210	11,852	13,192	65,889
3	TVS MOTOR	2,654	2,471	2,841	3,111	3,656	3,933	4,613	23,279
4	PIAGGIO VEHICLES	870	890	964	1,062	1,147	1,373	1,461	7,767
5	OMEGA SEIKI	510	533	506	249	299	402	498	2,997
6	TI CLEAN MOBILITY	570	467	422	294	343	394	472	2,962
7	DILLI ELECTRIC	259	280	294	298	443	581	697	2,852
8	MINI METRO	72	70	108	293	492	615	995	2,645
9	EULER MOTORS	180	172	199	206	245	276	311	1,589
10	J. S. AUTO	102	96	87	78	95	152	287	897
	OTHERS	1,295	1,350	1,527	1,933	2,885	4,072	5,692	18,754
	TOTAL	20,815	21,359	23,728	25,970	31,420	34,593	41,379	199,264

Leading e-3W L5 Cargo OEMs | Sales Trend | Jan 2026 - Jul 2026

S No	Maker	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Total
1	MAHINDRA LMM	485	584	570	658	615	664	678	4,254
2	BAJAJ AUTO	475	472	533	461	549	476	530	3,496
3	OMEGA SEIKI	370	380	326	236	331	341	368	2,352
4	EULER MOTORS	221	202	235	263	229	254	285	1,689
5	DILLI ELECTRIC	69	76	137	153	229	284	295	1,243
6	ATUL AUTO	288	287	239	67	58	73	82	1,094
7	TVS MOTOR	112	72	117	125	150	129	185	890
8	PIAGGIO VEHICLES	61	84	172	137	132	170	116	872
9	GREEN EVOLVE	140	151	250	-	45	-	137	723
10	TI CLEAN MOBILITY	61	54	73	75	84	100	115	562
	OTHERS	876	888	1,119	1,137	1,631	1,917	2,153	9,721
	TOTAL	3,146	3,236	3,763	3,298	4,050	4,406	4,943	26,842

Source: EVreporter Intelligence, Data from Vahan dashboard. Low-speed 2W data not included.

Leading Electric Car OEMs | Sales Trend | Jan 2026 - Jul 2026

S No	Maker	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Total
1	TATA MOTORS	9,210	6,608	9,458	9,608	11,037	12,860	14,222	73,003
2	MAHINDRA & MAHINDRA	4,371	3,536	6,255	6,141	6,695	8,208	8,038	43,244
3	JSW MG MOTOR INDIA	5,567	3,939	5,966	5,584	5,323	6,199	5,883	38,461
4	MARUTI SUZUKI	224	232	1,027	1,354	1,676	2,004	1,655	8,172
5	VINFAST AUTO	478	452	778	1,321	1,296	1,460	1,524	7,309
6	BYD INDIA	304	395	513	561	763	930	798	4,264
7	KIA INDIA	397	377	540	419	460	539	606	3,338
8	HYUNDAI MOTOR	386	379	560	565	478	376	585	3,329
9	BMW INDIA	384	299	520	348	374	519	391	2,835
10	MERCEDES-BENZ INDIA	88	90	119	121	221	245	175	1,059
	Others	239	186	347	246	203	278	415	1,914
	Total	21,648	16,493	26,083	26,268	28,526	33,618	34,292	1,86,928

Leading e-Bus OEMs | Sales Trend | Jan 2026 - Jul 2026

S No	Maker	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Total
1	JBM AUTO	110	151	206	62	157	118	118	922
2	SWITCH MOBILITY	100	280	161	62	52	175	53	883
3	PMI ELECTRO MOBILITY	50	83	123	111	50	176	118	711
4	OLECTRA GREENTECH	81	100	-	1	106	127	132	547
5	PINNACLE MOBILITY	25	2	35	52	5	52	52	223
6	AEROEAGLE AUTOMOBILES	29	20	22	28	3	11	24	137
7	VE COMMERCIAL VEHICLES	5	4	-	2	-	42	41	94
8	TATA MOTORS	26	18	2	3	3	21	7	80
9	JSW GREENTECH	-	-	-	25	-	-	-	25
10	AZAD INDIA MOBILITY	-	-	10	-	-	4	3	17
	Others	-	-	-	1	4	6	1	12
	Total	426	658	559	347	380	732	549	3,651

CHOGORI

Reliable Connections Multiple Styles Available

- For E-scooter charging and discharging applications -

Bourbon80 3+6 (90A+5A)

Bourbon80 2+8 (90A+5A)

One-Handed Operation

Touch-Proof Tip

High Power 90A

3000 Cycles

**IP67 Mated
IP67 Panel Side**

Bourbon80

e-Goods Carrier Sales Trend | Jan 2026 - Jul 2026

Vehicle Class	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Total
e-LCV	1,549	1,381	1,888	1,892	2,032	2,507	2,877	14,126
e-HCV	144	125	62	77	91	114	203	816
Total	1,693	1,506	1,950	1,969	2,123	2,621	3,080	14,942

Leading e-LCV (N1+N2) OEMs | Sales Trend | Jan 2026 - Jul 2026

S No	Maker	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Total
1	TATA MOTORS	671	633	887	815	882	1,118	1,313	6,319
2	EULER MOTORS	347	300	484	554	565	730	786	3,766
3	MAHINDRA LMM	258	237	274	291	270	333	375	2,038
4	SWITCH MOBILITY	93	79	96	82	160	130	137	777
5	TIVOLT ELECTRIC	57	68	86	81	67	81	148	588
6	VE COMMERCIAL VEHICLES	61	40	38	41	61	54	77	372
7	JUPITER ELECTRIC MOBILITY	34	4	1	2	10	8	-	59
8	KINETIC MOTOR	8	-	-	4	8	31	2	53
9	QUCEV TECHNOLOGIES	3	4	1	8	1	1	7	25
10	PINNACLE MOBILITY	5	2	3	-	2	2	3	17
	Others	12	14	18	14	6	19	29	112
	Total	1,549	1,381	1,888	1,892	2,032	2,507	2,877	14,126

Leading e-HCV (N3 Trucks) OEMs | Sales Trend | Jan 2026 - Jul 2026

S No	Maker2	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Total3
1	ENERGY IN MOTION	53	16	14	34	26	21	37	201
2	IPL TECH ELECTRIC	18	18	23	22	23	32	59	195
3	SANY HEAVY INDUSTRY	42	23	10	19	15	41	43	193
4	BLUE ENERGY	3	30	-	-	-	2	13	48
5	TATA MOTORS	11	-	3	-	4	3	25	46
6	QUCEV TECHNOLOGIES	-	10	5	-	15	-	15	45
7	ASHOK LEYLAND	-	10	6	-	-	3	9	28
8	PROPEL INDUSTRIES	5	15	-	-	-	5	2	27
9	OLECTRA GREENTECH	9	2	1	-	1	-	-	13
10	PINNACLE MOBILITY	-	-	-	2	7	1	-	10
	Others	3	1	-	-	-	6	-	10
	Total	144	125	62	77	91	114	203	816

Source: EVreporter Intelligence, Data from Vahan dashboard. Low-speed 2W data not included.



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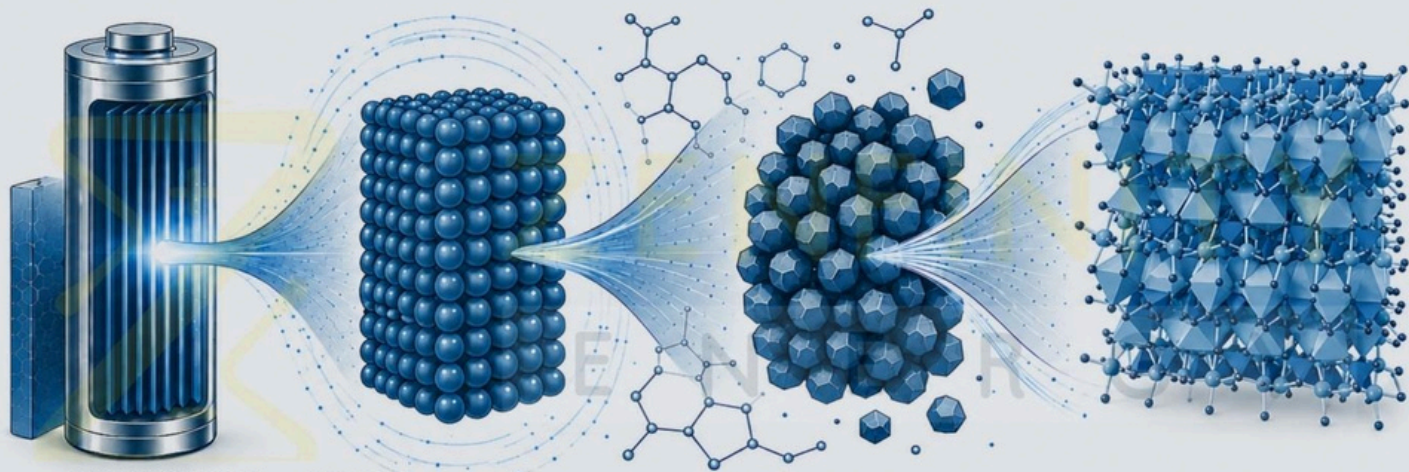
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The Five Generations of LFP: Everything You Need to Know.

From Mass-market to Industry's High-Performance Standard

LFP GENERATIONS (2-3-4) EXPLAINED



THE MATERIAL - LiFePO_4

An olivine crystal held together by strong phosphorus–oxygen bonds: thermally stable, hard to push into thermal runaway.



THEORETICAL
CAPACITY

~ **170 mAh/g**



NOMINAL
VOLTAGE

~ **3.2 V**



THEORETICAL
DENSITY

~ **3.6 g/cm³**



CONDUCTIVITY

~ **10^{-9} S/cm**
~ **10^{-2} S/cm**
(With Carbon Coating)



GEN 2 • FOUNDATION

Made LFP cheap and bankable.

GEN 3 • MAINSTREAM

Refined recipe that captured
EV and ESS market space

GEN 4 • FRONTIER

Re-architected the particle system
for density and charging speed.



Dr. Ravindra Kempaiah, CTO

"Generation" is informal industry shorthand, not a standard.
Figures are representative ranges.

01

Compaction density has quietly become the most important number on an LFP spec sheet - and the most misunderstood. Here is **what separates a Gen-2 cell from a Gen-5**, why the physics of fast charging is hard to beat, and how China's July 2025 export controls have redrawn the map for every non-Chinese cell manufacturer.

By Dr. Ravindra Kempaiah (CTO), Joel Manore (Designer), Zenfinity Energy | PART 1

A chemistry, not a product

Every week, someone in the energy storage industry uses the phrase "LFP battery" but there are multiple generations within this "LFP Battery" category depending on the cathode formulation.

LFP – lithium iron phosphate – is a chemistry. LiFePO_4 at the particle level is an olivine crystal structure with 3.2 V nominal voltage. LFP has safety characteristics rooted in strong phosphorus–oxygen (P–O) bonds that make the material thermally stable and difficult to push into thermal runaway. These properties do not change from one manufacturing generation to the next. What changes are the energy density, the internal resistance, and the fast-charging capability. There are now 5 distinct generations of manufacturing evolution - each representing a measurable leap in material processing, particle engineering, and system-level integration.

A Gen-2 cell and a Gen-5 cell share an identical chemical formula but the performance gap between them is larger than the gap between entry-level and premium NMC chemistry.

Most engineers, integrators, and R&D teams working with LFP today are not aware this distinction exists. The industry has grown faster than the collective technical knowledge. This piece is an attempt to close that knowledge-gap and educate the growing ecosystem.

What "generation" actually means in LFP

A generation shift in LFP is not a change to the crystal. **It is a change to how the crystal is processed, packed, and engineered at the particle level.** The single defining metric across all generations is compaction density – the mass of active cathode material packed per unit of electrode volume.



Because LFP has a lower intrinsic theoretical material density (3.60 g/cm^3) than nickel-based chemistries like LiNiO_2 (4.8 g/cm^3), **increasing compaction density is the central engineering lever that closes the energy density gap.** Every generation represents a measurable advance on that lever – but arrived at through improved process. However, with Gen-5 reaching powder compaction density of $\geq 2.70 \text{ g/cm}^3$, it must be noted that practical manufacturing methods cannot achieve the perfect theoretical density of 3.60 g/cm^3 .

An important qualification before the numbers: these generations are **informal industry shorthand**, not a formal standard. Two Gen-3 cells from two different manufacturers will differ meaningfully in their exact compaction density, electrolyte formulation, binder chemistry, additive package, and sintering profile. The way particle size distribution is tuned across kiln temperature zones alone can shift a cell's performance envelope by 10 to 15 percent on any given metric. The generation label captures the process discipline and the resulting performance band. It does not capture the manufacturer-specific art embedded in every step of the production line.

Gen-1: The Origin

Gen-1 is the historical foundation on which everything that follows is built. It refers to the earliest LFP cathodes produced shortly after LiFePO_4 was identified as a viable lithium-ion cathode by Prof. John B. Goodenough and co-workers at the University of Texas at Austin in 1996–97. These first-generation materials were micron-scale, undoped, and uncoated, with intrinsic electronic conductivity so poor (on the order of 10^{-9} S/cm) that practical rate capability was extremely limited.

The breakthrough that made LFP commercially usable came from Michel Armand, Michel Gauthier, and colleagues at Hydro-Québec and the Université de Montréal, who pioneered conductive carbon coating on nano-sized LFP particles, a route that raised effective conductivity by several orders of magnitude and unlocked the material’s use in real cells. Gen-1 was never a mass-market product in the modern sense; it is the pre-industrial base case against which every later generation’s compaction, coating, and particle-engineering advance is measured.

Comparative overview: Gen-1 through Gen-5

Generation	Powder Compaction	Electrode Compaction	Cell Energy Density	Peak Fast-Charge
Gen-1	Not reported	Not reported	~90–120 Wh/kg	$\leq 1\text{C}$
Gen-2	~2.40 g/cm ³	~2.50 g/cm ³	160–170 Wh/kg	$\leq 2\text{C}$
Gen-3	~2.50 g/cm ³	~2.65 g/cm ³	180–200 Wh/kg	~2C
Gen-4	~2.60 g/cm ³	~2.70 g/cm ³	200–210 Wh/kg	4C–6C
Gen-4.5	~2.65 g/cm ³	~2.80 g/cm ³	~205 Wh/kg	6C–10C
Gen-5	≥ 2.70 g/cm ³	Proprietary	~205 Wh/kg	Up to 15C

Table 1. Compaction, energy density, and fast-charge envelope by generation, Gen-1 through Gen-5. Figures are representative ranges; vendor implementations vary.

Gen-2 and Gen-3: the foundation and the current mainstream

Gen-2 - Foundation

Gen-2 is built on conventional solid-phase synthesis. Precursors are mixed, subjected to a single high-temperature sinter, and jet-milled into a broadly unimodal, coarse powder. It is deliberately simple and **not engineered for fast charge**.

Companies like Shenzhen Dynanonic (德方纳米, listed as 300769.SZ) have historically used solid-state routes, though they have shifted over time toward what is often called “liquid-phase” or “carbothermal reduction” methods. *Shenzhen Dynanonic has been a supplier to Tier-1 cell makers like CATL, and EVE.*

In Gen-2, the coarse particles create long lithium-ion diffusion paths – adequate for small-capacity storage at modest C-rates but limited in cold climates where diffusion slows further. At room temperature, cycle life sits at 2,000 to 3,000 cycles. Capacity fades as a result of loss of active material, solid-electrolyte interphase (SEI) growth, and electrolyte degradation, among other parasitic reactions.

Carbon coating is present but typically non-uniform. Because the coating precursor is dry-mixed with LFP precursors before sintering, coverage on individual primary particles is inconsistent. You often see 1.5–2.5% total carbon content with significant patches of bare LFP surface exposed to electrolyte. This is a major reason for the poorer high-temperature cycle life: bare Fe^{2+} surface sites dissolve into the electrolyte more readily.

Cell energy density lands between 160 and 170 Wh/kg. Cost and complexity are the lowest across all generations.

Gen-2 made LFP commercially viable at scale. It remains relevant today in cost-constrained applications: low-cost cells for 2Ws and 3Ws in developing markets, small-format solar storage under 5 kWh, and entry-level residential systems where there is price-sensitivity.

Gen-3 - Refinement, not reinvention

Gen-3 changes nothing fundamental. It is still LiFePO_4 . It is still a unimodal particle distribution. It is still a single sinter with carbon coating. Every step is simply executed better – and the gains compound to offer significant enhancement. Four process levers define Gen-3:

- **Higher-purity precursors.** Feedstock purity greatly influences cycle life. Gen-3 producers moved to reagent-grade iron, lithium, and phosphate precursors with tightly specified impurity limits, particularly for the transition metal contaminants (Cu, Ni, Cr, Zn) and moisture that catalyzes irreversible degradation in olivine LFP. Every PPM of contamination excluded from the feedstock is one fewer nucleation site for parasitic side reactions, Fe^{2+} dissolution, and destabilization over the cell's operating life.
- **Conformal carbon coating on nano-LFP.** Carbon coating is applied through more controlled routes – either dissolved organic precursors that infiltrate a spray-dried precursor before pyrolysis, or two-step coating processes. Coverage is more conformal, thickness is more uniform (typically 1–3 nm), and total carbon content is often lower (0.8–1.5%) while still delivering better conductivity because coverage is higher quality.
- **Homogeneous slurry.** Even local current density during coating and calendaring. Predictable aging. No hot spots. No cold spots.
- **Better calendaring.** Higher compaction density achieved without over-crushing the coated particles. This is the difference between good process control and great process control.

The result: **180–200 Wh/kg at the cell level, $\geq 3,000$ cycles to 80% state of health**, and approximately 70% capacity retention at $-20\text{ }^{\circ}\text{C}$. Sintering kiln temperature tolerance tightens to $\pm 5\text{ }^{\circ}\text{C}$.

Gen-3 is the rational cost-performance default for most passenger EVs and standard grid BESS deployments today. It is what the current mass market deploys in GWh-scale.

Gen-4: where manufacturing becomes a precision discipline

Gen-4 is where substantial improvements arrive in fast charging and cold-weather performance. Where Gen-3 delivered its gains through incremental process refinement, Gen-4 delivers them through architectural redesign of the particle system itself. This is the generation where LFP manufacturing crosses from bulk chemistry into precision materials engineering – and where the barrier to entry becomes substantial rather than incremental.

Particle gradation technology

The single defining shift in Gen-4 is particle gradation. Rather than producing a bulk powder of similar-sized particles, Gen-4 manufacturers engineer a precise multi-modal distribution: nanoparticles are positioned strategically within the interstitial gaps between larger particles.

The geometry matters. A unimodal packing of spheres – even perfectly packed – leaves roughly 26% void space. A carefully designed multi-modal distribution can push that void fraction below 15 percent. **That is where the compaction density gain comes from.** Critically, it is achieved without the mechanical stress that crushes individual particle surface coatings – the failure mode that limits how far you can push a Gen-3 process with pressure alone.

Precursor evolution

The precursor chemistry also shifts in Gen-4. Manufacturers increasingly move from the conventional hydrated iron phosphate route toward the ferrous oxalate synthesis route. Ferrous oxalate delivers tighter, more uniform particle size distribution – but it is more demanding to handle due to lower stability in ambient air. Handling protocols tighten and the process complexity rises. So does the barrier to entry.

The cathode preparation process chain

It is worth naming, in one place, the full sequence of **process steps that turn precursors into a finished LFP cathode powder**. Each step is a potential defect source and a potential yield loss. In Gen-4 manufacturing, each step is also independently instrumented and controlled.

- **Mixing** - precursors combined under controlled atmosphere and stoichiometry.
- **Sanding systems** - wet milling to break down agglomerates and achieve target particle size before drying.
- **Spray drying** - controlled evaporation forms uniform precursor granules.
- **Sintering** - the crystallisation step. Gen-4 uses two-stage sintering: first stage forms the crystal; second stage densifies it. Kiln temperature tolerance tightens from ± 5 °C in Gen-3 to ± 2 °C in Gen-4.
- **Secondary crushing** - controlled fracture back to target particle distribution without damaging the carbon coating.
- **Impurity refinement** - including precise magnetic impurity removal.

Magnetic impurity removal - the underappreciated process

Magnetic impurity removal is one of the most consequential and least discussed steps in high-generation LFP manufacturing.

Trace ferromagnetic contamination from iron, nickel, and chromium particles introduced through equipment wear, precursor handling, or transport, can migrate to the cathode-electrolyte interface during cycling and eventually cause micro-shorts inside the cell. **At Gen-4 and Gen-5 compaction densities, where inter-particle spacing is already minimised, the tolerance for magnetic contamination is minimal.** Modern high-precision LFP lines therefore include multi-stage electromagnetic separation for the cathode powder, and equivalent treatment for graphite anode material. Removing these impurities at the PPB level is a prerequisite for reaching fast charging and safety targets that define Gen-4 and above.

The physics trade-off Gen-4 must beat

Higher tap density slows fast charging rate. It is a physical limitation.

The trade-off between tap density and charge rate is fundamental. As porosity between particles is reduced to increase volumetric density, the surface area available for electrolyte wetting decreases and ion transport is restricted. Polarization rises during discharge, and the operating voltage can drop under load, leading to hysteresis. Simply pushing tap density up without addressing this side of the equation produces a denser cell that charges slower and delivers less usable energy under real duty cycles.

Gen-4 resolves this by engineering artificial ionic pathways through the electrode structure – designed channels that preserve electrolyte access to the interior of the multi-modal packing. Combined with advanced electrolyte formulations and thin anode-side coatings that stabilise the solid-electrolyte interphase, this is what allows Gen-4 to reach 4C–6C fast-charge rates at 2.60 g/cm³ powder compaction – a combination that was not physically achievable in Gen-3.

*This capability – the simultaneous engineering of density and ion transport – is precisely what cannot be replicated by process substitution. **It is also precisely what China's July 2025 export controls placed behind a technology license. [Read the full article here](#)***

About the authors

- **Dr. Ravindra Kempaiah** is Chief Technology Officer at Zenfinity Energy Pvt. Ltd. His work spans battery materials science, cell chemistry, and field-deployment engineering across residential, C&I, and grid-scale energy storage applications. **Joel Manore** is an Animation Designer and a creative professional at Zenfinity Energy Pvt. Ltd. He brings complex ideas and emerging technologies to life through engaging visuals. His work focuses on making technical concepts simple, clear, and accessible to a wider audience.
- **Zenfinity Energy** operates a Battery R&D Lab at **IIT Madras Research Park** and has received the Karnataka ELEVATE Nxt Deep-tech grant.

Part 2 of this article (Oct 2026 magazine) will cover Gen-5, AI-driven process control, CATL's visual AI approach, and What China's export controls means in practice and for India

The E-2W Sales India **Doesn't Track**

— Why Should it Bother Us? —



Electric motor technology company Naxatra Labs reviewed 24 months of Indian customs data under HS 8711.60, from Nov 2023 to Oct 2025, to gauge import volumes of low-speed electric 2W CKDs (Completely Knocked Down kits).

The CKD kits contain the individual disassembled components of the electric scooter that can be factory-assembled in the country of import. The 2Ws assembled from these CKDs (top speed 25 kmph and 250W motors) can operate without RTO registration, a driver's license, or a helmet. These are the same electric scooters you see used across the country, including tier-1/tier-2/tier-3 cities, villages, personal use, hyperlocal deliveries, and B2B fleet operations. A quick search on some leading low-speed e-2W brand websites shows price tags from INR 36,000 to 65,000. Many on the lower end come with a lead-acid battery.

Because these vehicles are not registered, their official sales data is not available. **CKD import data serves as a close indicator of how many of these vehicles are entering Indian roads.**

Key findings

Over these 2 years [Nov 2023 to Oct 2025], **398 Indian importers** imported **8,948 shipments** of low-speed e-2W CKD kits.

- 99.8% of the imports were from China.
- 68% came from suppliers in a single city, Wuxi, Jiangsu.

Combined CIF value ~USD 400 million.

CIF is the total cost of imported goods, including the product cost, marine insurance, and freight charges up to the destination port.

22,35,465 low-speed e-2W CKD kits were imported. In comparison, **25,04,515 high-speed e-2W registrations** were recorded during the same period.

Growth in Low-speed e-2W CKD Imports

- Jan–Oct 2025: 1,456,732 CKD units imported vs 584,947 during Jan–Oct 2024, meaning a **149% YoY growth**. In comparison, registered e-2W sales grew from 10,09,831 to 11,12,567 between Jan–Oct 2024 and Jan–Oct 2025.
- October 2025 was India's best-ever month in e-2W registration volume during the year, at 1,50,890 units. In this month alone, 2,87,473 CKD units landed. **The unregistered channel was 1.9 times the high-speed models.**

India's largest and fastest-growing two-wheeler segment does not appear in a single registration statistic.

Why This Should Bother Us

- **The value lost:** A kit costs \$80–110 EXW (ex-works, the value at the supplier location without transport and insurance costs) without a battery or tires, which are typically sourced locally to avoid battery logistics compliance and bulk. Every dollar of that imported frame, motor, controller, and charger is a component India could be making, at volumes that already justify the economics. Indian suppliers are missing out on all this volume and the value that can be captured locally.
- **The geography trend is inverted.** 71.5% of 2025 imports land with importers in Haryana, Delhi, UP, and Punjab. Importers in Haryana alone imported 527,995 units in ten months (Jan–Oct 2025), while Haryana e-2W registrations were 12,209 during this time. The importers in Haryana can, of course, be catering to multiple neighboring states – the point is to show the inverted nature of e-2W adoption. Where South India leads in registered e-2W sales, the North is a bigger low-speed market.
- **Average CIF per unit fell** from \$224 (2023) to \$166 (2025). The economics are moving the wrong way for us, making it even harder to reverse the trend or build a viable local supply chain for this category.
- It is well known across the industry that many of the imported non-RTO vehicles claiming a 25 kmph speed limit can actually operate up to 40–45 kmph, which is a **huge safety and regulatory issue**.

A growing one-million-plus-a-year market segment with no registration trail, no support, no battery-safety oversight, and no Indian supply chain behind it. It is the **largest EV opportunity that Indian companies are missing out on**.

Data Sources: Import data extracted and analyzed by Naxatra Labs: Indian customs bill-of-entry records, HS 8711.60, Nov 2023 – Nov 2025.

EV Registration data: EVreporter Intelligence, Vahan Dashboard



Why Batteries have a Defined Cutoff Instead of Being Used Until 0% SoH

Rahul Bollini, Bollini Energy

Rahul is a seasoned technical expert in Lithium-ion cells, EV batteries and BESS, with over 11 years of experience in manufacturing facility setup, process development, and project execution. Based in Bangalore and Shenzhen, he provides technical leadership and end-to-end project support to companies across global markets. He can be reached at +91-7204957389; bollinienergy@gmail.com.

End-of-life (EOL) of a battery cell and battery system is defined as the State-of-Health (SoH) value at which the battery is no longer fit to serve the intended application.

SoH of a battery is calculated as = Existing Capacity (Ah) / Nominal Capacity (Ah) * 100%

Reaching the EOL is often misunderstood as the battery completely stopping working. It actually means the battery system is no longer suitable to be used due to the following reasons:

- **Unacceptable Performance:** Battery degradation (range for an EV or backup time for Energy Storage) is noticeably faster than before. EOL can mean different things to different application users. For example, a power tool application user would define EOL as when the battery can no longer deliver the high power required by the tool; the battery would simply cut off due to a voltage drop or an overtemperature issue detected by the system.
- **Increase in internal resistance (IR):** It leads to higher heat generation in the battery system, lowers battery efficiency, and/or increases auxiliary power consumption to cool the battery.

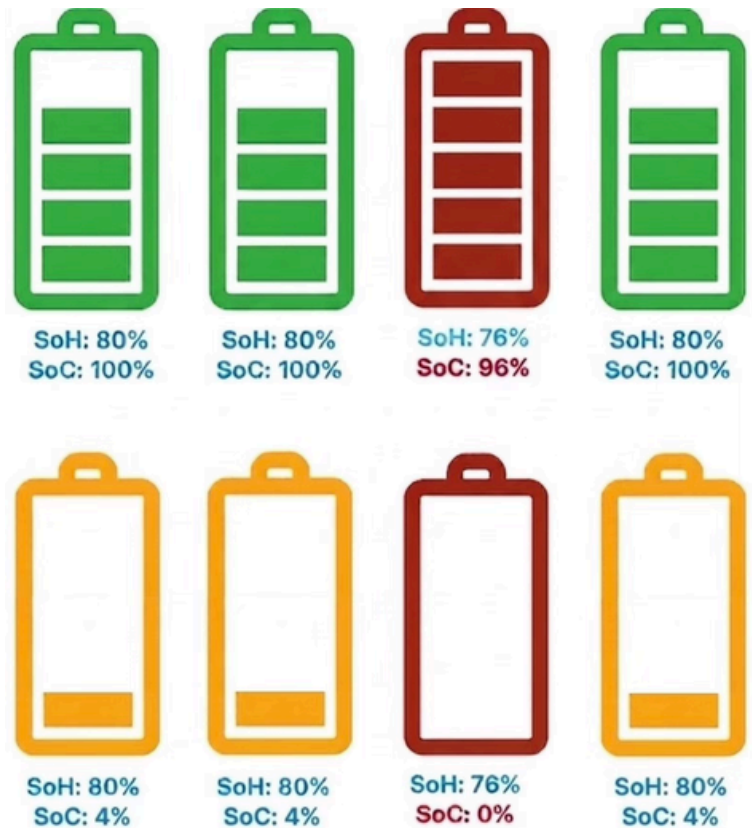
Depending on the application, **EOL is considered when the ACIR reaches 1.5x to 2x of the original value.** An increase in IR also lowers the battery's C-rate capability. Fast charging and high-power discharge capability. For example, high-performance electric vehicles consider 80% SoH as EOL due to reduced fast-charging capability and limited ability to handle regenerative braking and acceleration.

- **Drop in Voltage Profile:** Aging batteries have a lower voltage profile, and this drop can lead to premature battery cut-off (undervoltage cut-off mechanism) even when the cells still have Ampere-hour (Ah) capacity left.
- **Uneven SoH of cells in a battery system:** The degradation of the cells is not even anymore after reaching a certain SoH; hence, cells have different SoH, and the lowest-capacity cell decides the overall energy delivered by the battery system. This is a key reason the EOL of the cells and battery system is defined.



Here is an example where one cell has 4% lower SoH than the other cells, meaning the other cells cannot be fully charged during charging or fully discharged during discharge.

This leads to lower energy retention in the battery.



Hence, it must go to a repurposing/refurbishing facility to make a second-life battery system using cells with similar grouping values.

DCIR values play a crucial role when grouping cells disassembled from a first-life battery system for assembly into a second-life battery system. These second-life batteries are typically built for low-voltage, low-power applications and, most importantly, for low-DoD applications.

Cell EOL vs Battery System EOL

The difference between cell degradation and battery system degradation is explained very well in **BESS projects where the cells are rated as EOL at 70% SoH, whereas the system is rated at 60% SoH**. This is possible because the BMS can balance the cells to some extent and by not keeping the depth of discharge (DoD) very close to 100%.

EOL Management for BESS

When using a centralized PCS (bidirectional inverter for the battery), a **100% DoD usage pattern will have serious impacts**, especially when the system SoH goes below 70%. It is a well-known fact that SoC error is up to 5% for large-scale LFP battery systems. This number increases as the system nears EOL. If you choose to operate close to 100% DoD for a large energy storage (multiple-cluster type) system, it is recommended to use **a dedicated string PCS for every cluster**.

String PCS manages the discharge profile of every cluster individually and can provide maximum energy output. However, string PCS is more expensive than centralized PCS, which can affect project viability.

Company	Amount Raised	Round	Key Investors	Details
Ather Energy	₹1,758 crore		Hero MotoCorp	Hero MotoCorp is increasing its stake in Ather Energy from 29.88% to 32.8% of share capital.
River Mobility	\$120 million	Series C (equity + venture debt)	Elev8 Venture Partners and Claypond Capital, with participation from Singularity AMC, Anicut Capital, 360 ONE Asset, JIF Capital, HDFC AMC, Yamaha Motor Co, AI-Futtaim Group and Mitsui & Co,	Venture debt firms Alteria Capital, InnoVen Capital India and Stride Asset Management.
Matter Motor Works	₹240 crore		Existing investors	Over ₹750 crore deployed for R&D, manufacturing and market build-up.
Omega Seiki Mobility	₹100 crore		Abhishek Misra, Unistone Capital, Sanjeev Agarwal Family Office, Brijesh Parekh Family Office, Securocorp Securities, Sangeeta Pareekh, Saket Aggarwal Family Office, and Vanshika Sharma.	Currently operates 150 touchpoints; plans to expand to 250 by FY28.
Yulu	\$93 million	Series C (\$63M in equity + \$30M in debt)	GEF Capital Partners	To expand fleet to 200,000 EVs in two years, and launch Yulu Express for e-commerce logistics/bike taxis.
Yuma Energy	\$35 million		Magna International	Operates 2,500 charging and swapping units across more than 400 locations.
Zenergize	\$4 million	Pre-Series A	Giraffe Studios	Silicon Carbide (SiC)-based DC fast charger and solar inverter company
Adiabatic Technologies	₹8.3 crore	Seed	Malpani Ventures & Avinya Ventures; Appreciate Capital, DeVC, Operators Studio, UPES Incubator	To expand annual manufacturing capacity to 100 MWh.
EzyFleet	₹3.2 crore	Seed	Saffron Maple Ventures	Operates 150+ e-3Ws/4Ws in 10 cities.

Electric 2W and 3W OEM Updates



LAUNCHES

Ather Energy launches Konarc, a mass-market e-scooter starting at **₹99,999 (ex-showroom, Bengaluru)**. S 125 km and S 161 km variants will be available first. Deliveries start mid-September.

- S line (4 variants): IDC range of 100 km, 125 km, 161 km, and 200 km
- Z line (2 variants): IDC range of 125 km and 161 km

Ola Electric launches S1Z e-scooter from ₹79,999 for the 3.1 kWh battery variant, with a 5.1 kWh variant priced at ₹99,999 (ex-showroom). The battery uses in-house LFP cells from Ola's Gigafactory, which the company says is key to this price point. IDC range: up to 179 km for the 3.1 kWh variant and 301 km for the 5.1 kWh variant.

Simple Energy launched the Wave electric scooter at ₹1.10 lakh (ex-showroom). Deliveries will begin on 25th September. The lineup spans Wave S, Wave, and Wave+ variants across 6 models, split across four battery sizes from 2.2 kWh to 5 kWh and ranges of 132 km, 171 km, and 243 km, powered by a 6.4 kW PMSM motor.

BGauss has launched the Oowah electric scooter at an ex-showroom price of ₹1,22,990. The Oowah has a 145 km range and runs on a removable LFP battery.

E3 Electric.Ai launched the E3 Trion in three variants — C1, C1x, and C2 — at introductory ex-showroom Bengaluru prices of ₹99,999, ₹1,09,999, and ₹1,19,999 respectively. The base C1 gets a removable 2.3 kWh battery, while the C1x and C2 use a fixed 3 kWh battery.

TVS Motor's iQube electric scooter has crossed 1 million customers, and the company marked the milestone with the **iQube MillionR Special Edition, available at an effective ex-showroom price of ₹1.4 lakh** in Karnataka.

Compage Automation Systems launched a **3W retrofit kit** in collaboration with Indofast Energy. Indofast Energy, a battery-swapping solution provider, is a JV between Indian Oil Corporation and Sun Mobility.



Passenger Vehicle Launch

JSW MG Motor India has launched the Hector Tomahawk in EV and PHEV variants. Introductory Battery-as-a-Service (BaaS) pricing is set at ₹13.99 lakh + ₹4.90/km battery rental for the EV, and ₹21.79 lakh + ₹3.20/km battery rental for the PHEV.

e-LCV Line Inaugurated

Euler Motors inaugurated a dedicated e-LCV manufacturing line at Palwal, Haryana, with an investment of ₹100 crore, expanding annual production capacity to 24,000 vehicles. The facility will manufacture the Turbo EV 1000 and Storm EV. It features an automated 4W assembly conveyor line, assembly lines, a body shop, and a battery pack assembly line.

Battery Updates

- **Epsilon's anode material project in Karnataka will receive Rs 145 crore in CAPEX support** from the Electronics Components Manufacturing Scheme of the Ministry of Electronics and Information Technology (MeitY). The company has commissioned its graphite anode material customer qualification plant, EAM-ONE, at Vijayanagar, Karnataka. It is now progressing towards commercial-scale manufacturing, which has received a nod from MeitY.
- **Epsilon Advanced Materials' LFP CAM (cathode active material)**, developed at its Cathode Technology Center in Moosburg, Germany, is moving to the **customer validation** phase with 5 lithium-ion cell makers across APAC, Europe, and the USA. The company unveiled its Gen 3.0 LFP Cathode Material in April 2026, with a discharge capacity of 159 mAh/g, electrode density of 2.51 g/cc or higher.
- **PCBL Chemical** has received approval under the Electronics Components Manufacturing Scheme (ECMS) for its **Acetylene Black project**, with a proposed investment of approximately ₹329 crore.
- **Exide Industries infuses an additional ~Rs 200 crore into its battery arm**, Exide Energy Solutions Ltd (EESL)—cumulative investment now stands at Rs 5,102.23 crore. The funds are earmarked for EESL's greenfield lithium-ion cell manufacturing facility in Bengaluru.



Heavy Commercial Vehicle Updates

- **Montra Electric** and **TVS Mobility** partner to deploy over **300 electric trucks during FY26–27**. In the first phase, TVS VMS has inducted 57 Rhino 5538 EV 4x2 TT trucks, which will operate on a 190 km route in **Chhattisgarh**.
- **Gateway Distriparks Limited** (GDL) deploys **Blue Energy Motors'** electric heavy-duty trucks for freight operations within its transportation network.
- **Energy In Motion** signs an MoU with **Oil Field Warehouse & Services Ltd. (OWS)** and **Radiance Green Mobility** for the deployment of **500 e-HCVs** on Mumbai–Pune, Mundra–Morbi–Ahmedabad, and Mumbai–Delhi freight corridors. Rollout begins with 50 vehicles on the Mumbai–Pune corridor in October 2026.
- **Sany India** delivered **18 heavy-duty electric trucks** to Thane-based Shri Dinesh Group, a logistics and infrastructure company.
- **Vertelo** has announced its first transaction in the electric truck segment in partnership with **Soragin Group and e-truck OEM Energy In Motion**. Vertelo also indicated that additional electric truck deals are in the pipeline.
- Drivn will offer leasing and financing solutions for Tata Motors' electric commercial vehicles to help fleet operators transition to EVs. **Drivn, Tata Motors and SwitchLabs have signed an agreement to deploy 150 e-HCVs in a single project.**
- **Drivn** announced a leasing partnership with **AVG Logistics** for up to 100 electric trucks. The partnership starts with the deployment of 30 electric trucks. Drivn will also provide financing, leasing, and fleet ownership solutions to **Ashok Leyland** electric commercial vehicle customers.



E-Bus Updates

- **Neuton Auto signed an MoU with Chalo to deploy 300 electric buses** for employee transportation in Mumbai, with plans to expand to other metro cities. Neuton Auto will supply buses built on its monocoque architecture, manufactured at its Pune facility.
- **Ohm Global Mobility launched 130 AC electric buses in Chennai** as part of Phase 2 of the Metropolitan Transport Corporation's e-bus program. Under this program, OHM will supply and operate 500 e-buses manufactured by Switch Mobility.
- **Chartered Speed has commenced PM e-Bus operations in Bikaner, Rajasthan.** The company has already deployed 47 electric buses across Jaipur and Bhilwara, followed by the recent inauguration of an additional 16 electric buses in Jaipur.
- Bangalore-based **Megha AutoElectric received homologation certification for its two electric bus models** from the Global Automotive Research Center. The company is a part of the Megha Group, which also runs Megha Travel Solutions.
- **Easy Green Mobility** receives homologation for its **13.5 M and 12 M e-buses**. Founded in 2024, Easy Green Mobility is a subsidiary of EaseMyTrip.com.
- **ChargeZone and Fresh Bus extend their partnership** to deploy an additional 400 E-Buses. ChargeZone's charging network will support 500 E-Buses in FreshBus's fleet. To power this expanded fleet, ChargeZone will deploy 30 MW of new charging capacity alongside its existing 10 MW of dedicated infrastructure.

E-LCV Update

BLive has signed an MoU with **Tata Motors** to deploy up to **1,000 Tata electric LCVs** through its franchise-owned commercial EV fleet program.

Kia EVs <> Reflex Mobility

Reflex Mobility has picked up 100 Kia Clavis EVs in Delhi-NCR for corporate mobility. Reflex Mobility had earlier deployed the Kia Clavis EV in Bengaluru and is now expanding the deployment to Delhi-NCR.

Policy & Government MoUs

- **Telangana Cabinet approved a ₹200-crore scheme to support the conversion of 18,766 ICE auto-rickshaws to EVs in the Hyderabad region.** Eligible auto owners will receive financial assistance of up to ₹1.5 lakh per vehicle, which can be used to retrofit existing autos or purchase new electric autos.
- During Vетtri **Tamil Nadu** Investment Conclave 2026, Lucas TVS and Ultraviolette Automotive signed MoUs to invest and manufacture EV/EV Components.
 - **Lucas TVS plans to invest a total of INR 2,500 crores** at multiple locations in the state to manufacture EV and automotive components.
 - **Ultraviolette committed INR 779 crores in Krishnagiri** to set up an Electric motorcycle manufacturing facility.
- Union Minister for Heavy Industries and Steel, Shri H.D. Kumaraswamy, chaired a meeting to review a proposal for a **Flash Charging-based Articulated Electric Bus System**. The meeting discussed the proposed system and its potential application in urban public transport in India.

More of Indian E-2Ws and E-3Ws Go International

- **Montra Electric launched its e-3W Super Auto in Nepal** in partnership with Hipco Superbuild, a Kathmandu-based steel-structure manufacturing facility.
- **TVS Motor launched the iQube in Kenya** with two battery variants. Both deliver a peak power of 4.6 kW and 0–40 km/h in 4.2 seconds. **TVS also launched two EVs in Sri Lanka** — King EV MAX (L5M) and TVS Orbiter (E-2W).

Electric Compressors for EVs and PHEVs

In an ICE car, the AC compressor is mechanically driven by the engine via a belt. However, EVs rely on self-contained electric AC compressors, as the compressor needs its own electric motor to circulate refrigerant.

- **Subros Limited** signed a Technical Assistance Agreement with DENSO and Toyota Industries Corporation, Japan, to localize electric compressors for EVs and Hybrid Vehicles. Manufacturing will take place in **Karsanpura, Gujarat**.
- **MAHLE** commenced production of electric compressors at its **Coimbatore** facility, following a ₹65 crore investment. The facility has an annual production capacity of 300,000 units.

EV Charging Updates

- **Trinity Cleantech** showcased its 150 kW **bioethanol-powered off-grid EV charger**, which integrates an onboard bioethanol-fuelled power-generation system, power-conversion electronics, an energy buffer, and a dual CCS2 DC charging interface. ME Energy originally developed the technology in Germany. Trinity completed the acquisition of ME Energy Technologies last year.
- **Exicom starts** manufacturing **liquid-cooled power modules** for EV chargers in India. It will manufacture AC and DC power modules at its Hyderabad facility.
- **Pulse Energy** has joined **Unified Bharat eCharge (UBC)** as a **technology enabler** for charging operators. UBC, an interoperable EV charging network developed by the Ministry of Heavy Industries, BHEL, and National Payments Corporation of India, allows EV users to find participating chargers and pay through UPI on the BHIM app. UBC is built using the open Bechn protocol, with the underlying digital public infrastructure developed by the Networks for Humanity (NFH) team.



Battery Swapping Updates

- **Indofast Energy**, in collaboration with **Glida India**, deploys 10 Quick Interchange battery swapping Stations (QIS) across GLIDA sites in Chennai, Bengaluru, and Hyderabad, with plans to scale up to 50 sites and 100+ QIS over the next year.
- **SUN Mobility launches a battery-swapping network in Kenya** in partnership with Vivo Energy to support 2W motorcycles and scooters, and 3W passenger and loader vehicles. It will be compatible with vehicles from 10+ OEM partners. The company's 35 swapping stations are already live across Nairobi and Mombasa.

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