EVreporter.com

EVreporter

APRIL 2026 | MAGAZINE

Issue no. 63

STERLING E-MOBILITY

Diverse range of EV Powertrain and Power Electronics Components for 2W Segments

POWERTRAIN

Nominal Voltage: 48V
Peak Power: 8.81kW
Torque: Max 25.5Nm
Peak speed: 10,500 RPM
Efficiency: ≥ 93.5%
Weight ≤ 8 kg

MAGNET-FREE MOTOR

POWER ELECTRONICS

OFF BOARD CHARGER

Peak Power: 1kW
Voltage System : 48V
Operating Temp: -10°C to 65°C
Communication: CAN

Voltage: 48 ~96V
Peak Power: 3 ~ 30kW
Efficiency: ≥98%
ASC and CAN Supported

MOTOR CONTROL UNIT

Email: info@sterlingemobility.com

CLEAN ELECTRIC

FLO150

State-of-the-art 15 kWh li-ion battery for electric 3-Wheelers (L5)

Breakthrough solution enabling 300+ KM range, 1-hour DC fast charging and up to 2x daily earnings for EV L5 operators

SOLVING THE CORE NEEDS OF E-3W L5

E-3W L5 customers continue to prioritise range and charging time, as these limitations directly impact utilization and daily earnings.

FLO150 disrupts that equation with a super compact design that fits into any L5 vehicle along with self contained immersion cooling for a long life and 1 hour fast charging ability.

BEST-IN-CLASS ACROSS PARAMETERS

- **300 KM+ Range (multiple vehicle IDC tests)**

Longer routes, more trips, less anxiety

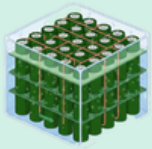
- **1-Hour DC Fast Charging**

~100KM top-up in 30 mins on universal Type 6

- **Super Compact Design**

World-leading energy density at 250 Wh/L

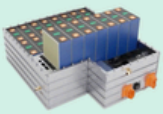
GAME-CHANGING BATTERY TECH



Immersion-based Direct Contact Liquid Cooling

Superior temperature homogeneity

Cell life strongly translates to pack life



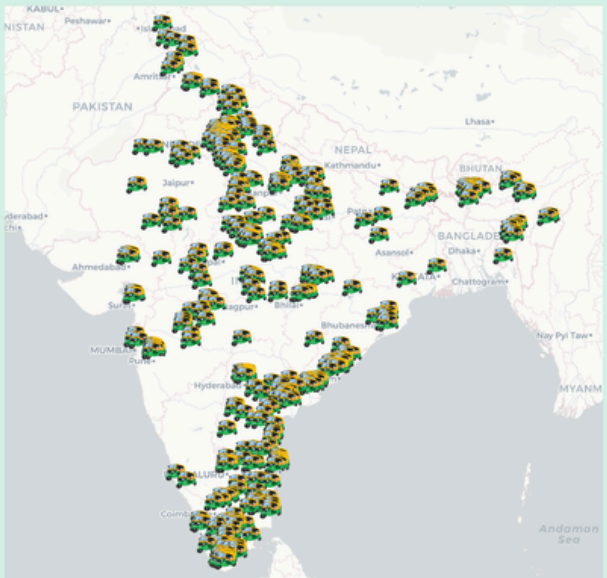
Cell-to-Pack Architecture

Module-less assembly with aluminum structural casing

20-35% better in weight & volume

Advanced BMS and Rapid Charging Algorithms

Enables long life even with rapid charging



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MARPOSS

THE REVOLUTION MOVES FORWARD

MEASUREMENT, TEST AND INSPECTION FOR EV COMPONENTS

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With manual and automatic benches all the EDU components can be checked as well as batteries and fuel cells.

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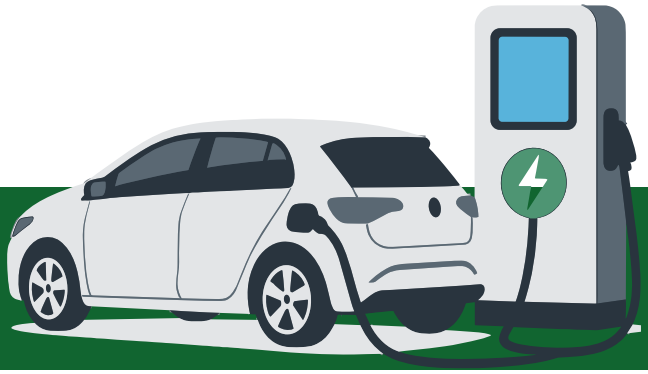
FC04 Pro 100A

FC09 40-60A

Superior shock absorption

Bi-direction insertion

What's INSIDE



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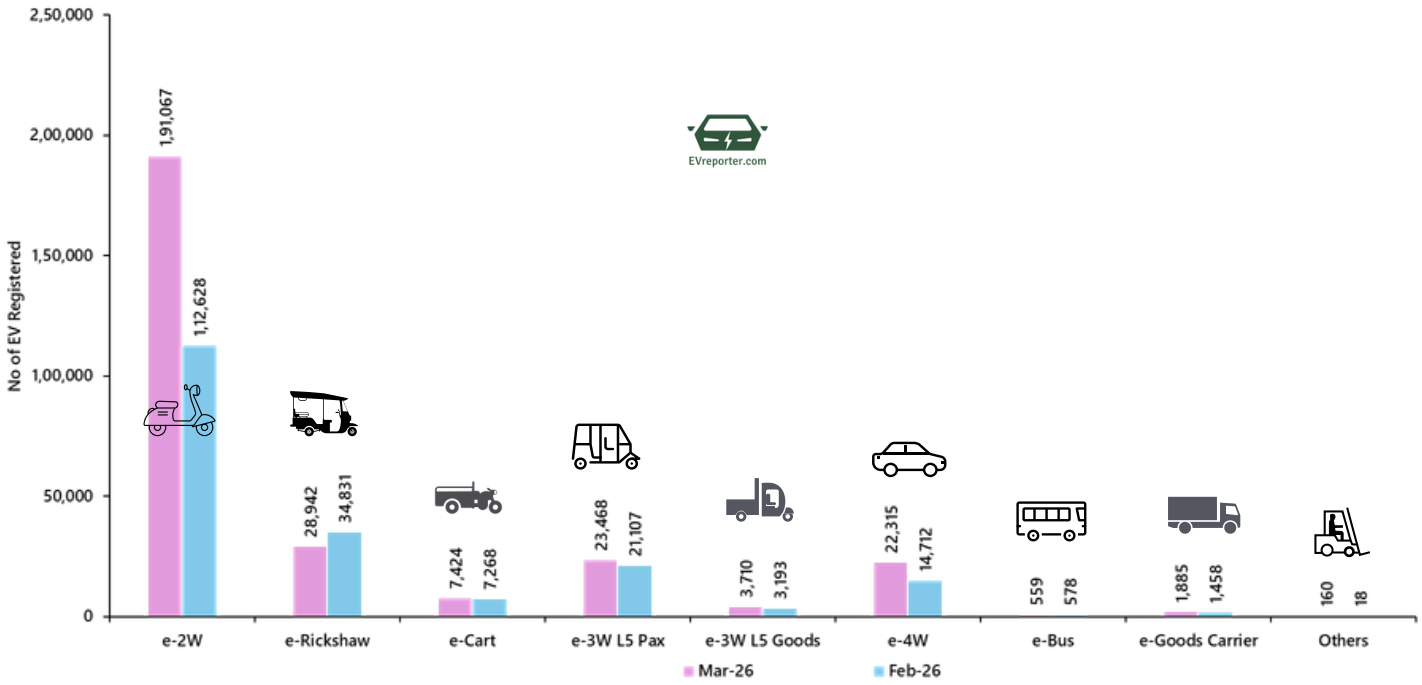
Accelerated by

ISB | aic Indian School of Business

Category-wise Electric Vehicle sales, MAR 2026 | India

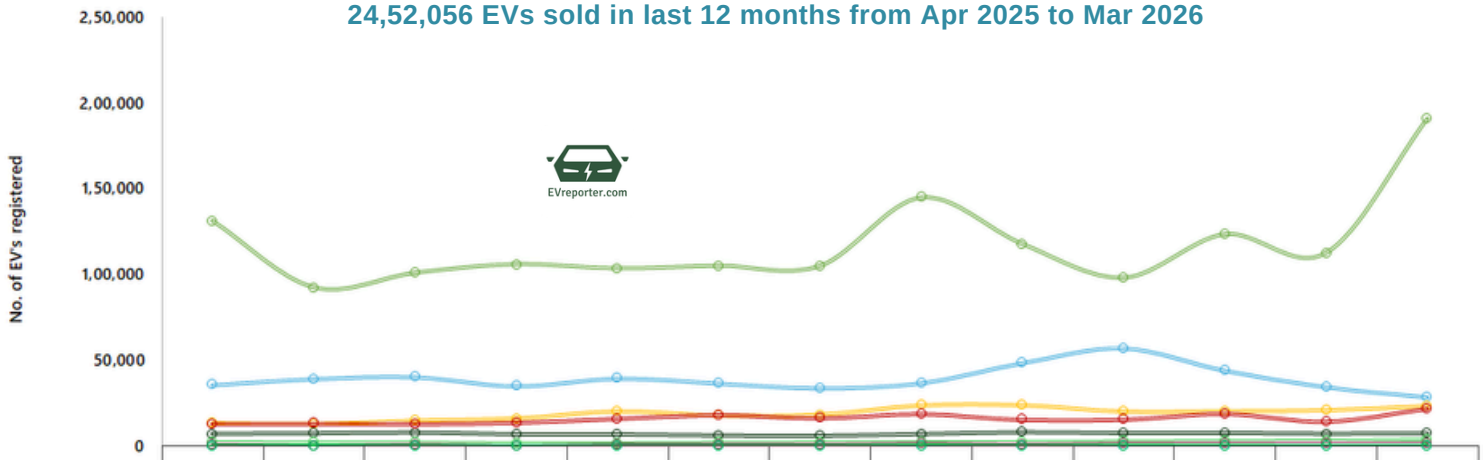
Total Registered Electric Vehicle Sales - **Mar'26 - 2,79,530** I Feb'26 - 1,95,793



'Goods Carrier' refers to N1, N2, N3 vehicles, including LCVs and HGVs, as categorised in Vahan dashboard. 'E-rickshaw' refers to low-speed electric 3Ws (up to 25 kmph) used for passenger transportation. 'E-cart' designates low-speed electric 3Ws (up to 25 kmph) used for goods transportation. 'L5M' stands for passenger 3W L5 vehicles, 'L5N' stands for Cargo 3W L5 vehicles.

Category wise-Sales Trend from Mar 2025 to Mar 2026

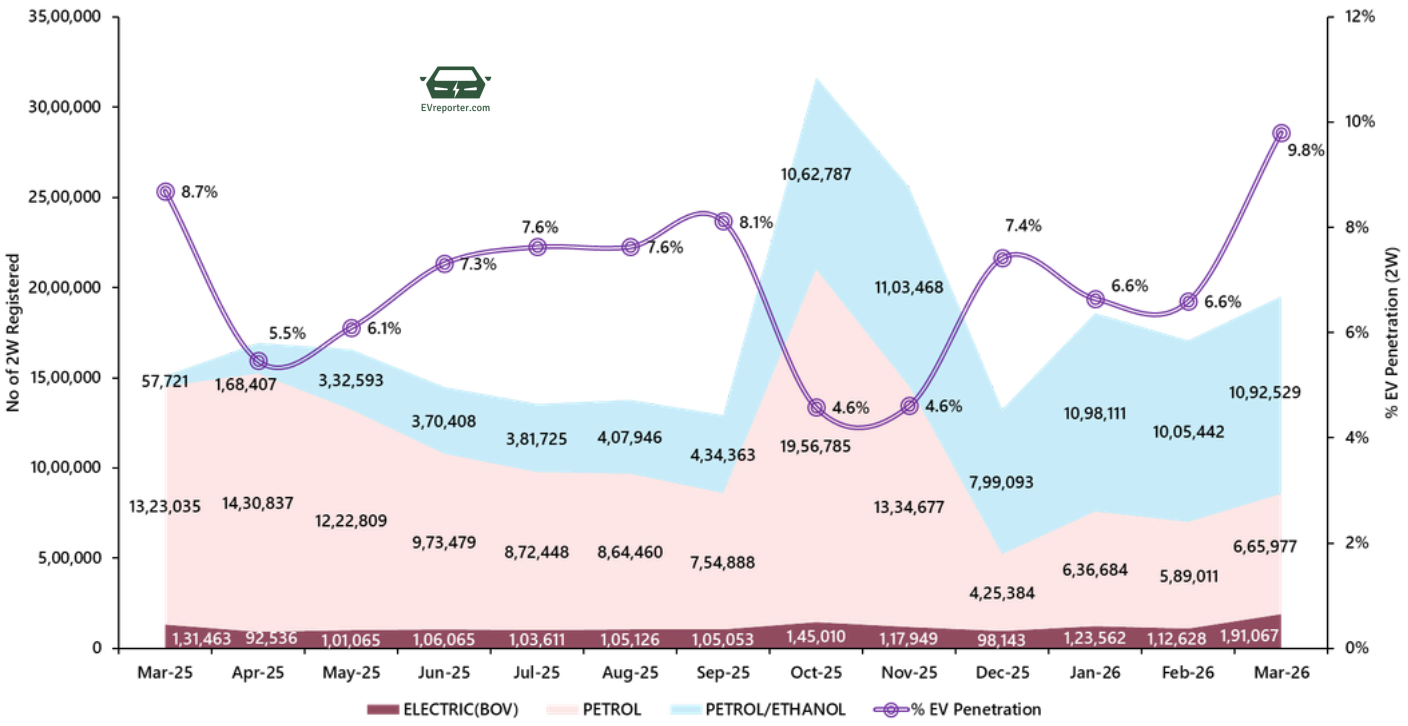
24,52,056 EVs sold in last 12 months from Apr 2025 to Mar 2026



	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26
E-2W	1,31,463	92,536	1,01,065	1,06,065	1,03,611	1,05,126	1,05,053	1,45,010	1,17,949	98,143	1,23,562	1,12,628	1,91,067
E-rickshaw	36,056	39,499	40,620	35,325	39,771	36,948	34,069	37,094	48,812	57,428	44,435	34,831	28,942
E-3W L5 PAX	13,543	13,121	14,992	16,328	20,441	18,000	18,492	23,953	23,992	20,339	20,553	21,107	23,468
E-cart	7,192	7,447	7,959	6,838	6,807	6,206	6,031	6,983	8,151	7,610	7,656	7,268	7,424
E-3W L5 GOODS	2,702	2,423	2,424	2,016	2,093	2,299	2,437	2,562	2,708	2,900	3,116	3,193	3,710
E-4W	13,333	13,408	13,319	14,057	16,340	18,587	16,682	19,241	15,696	15,791	19,315	14,712	22,315
E-Bus	280	284	338	529	363	394	346	290	369	569	391	578	559
E-Goods Carrier	679	618	679	617	882	1,143	1,221	1,486	1,302	1,397	1,639	1,458	1,885
Others	30	19	38	15	58	40	60	148	29	23	12	18	160
TOTAL	205278	169355	181434	181790	190366	188743	184391	236767	219008	204200	220679	195793	279530

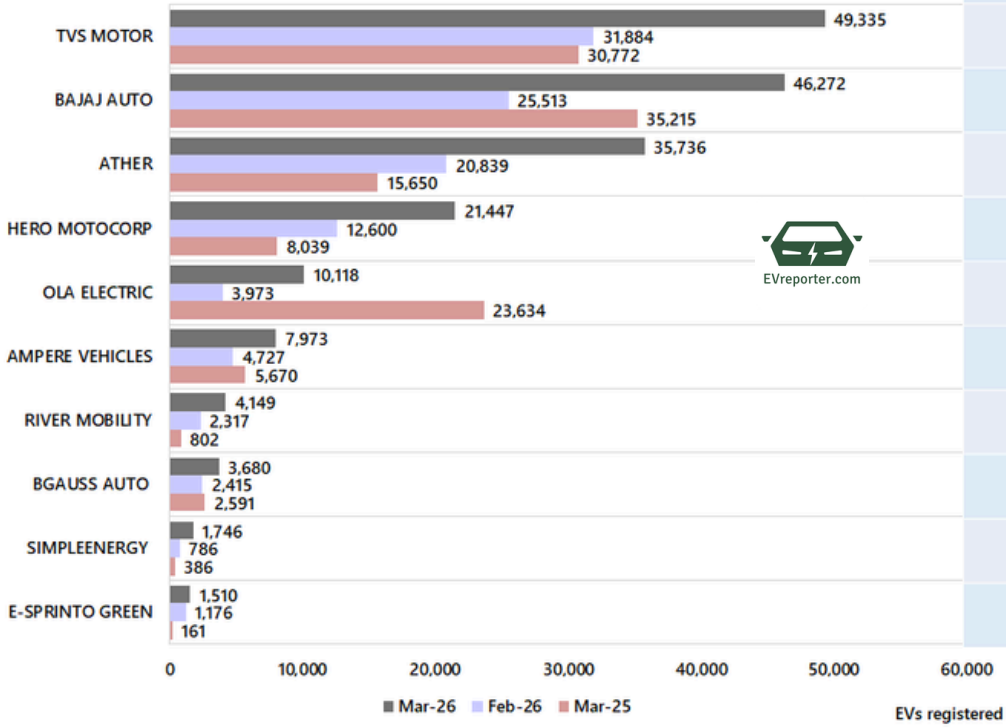
Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included. Low speed e-2W sales data not included.

Fuel wise 2-Wheeler Sales Trend, Mar 2025 - Mar 2026



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

E-2W Sales in Mar 2026 | Leading OEMs

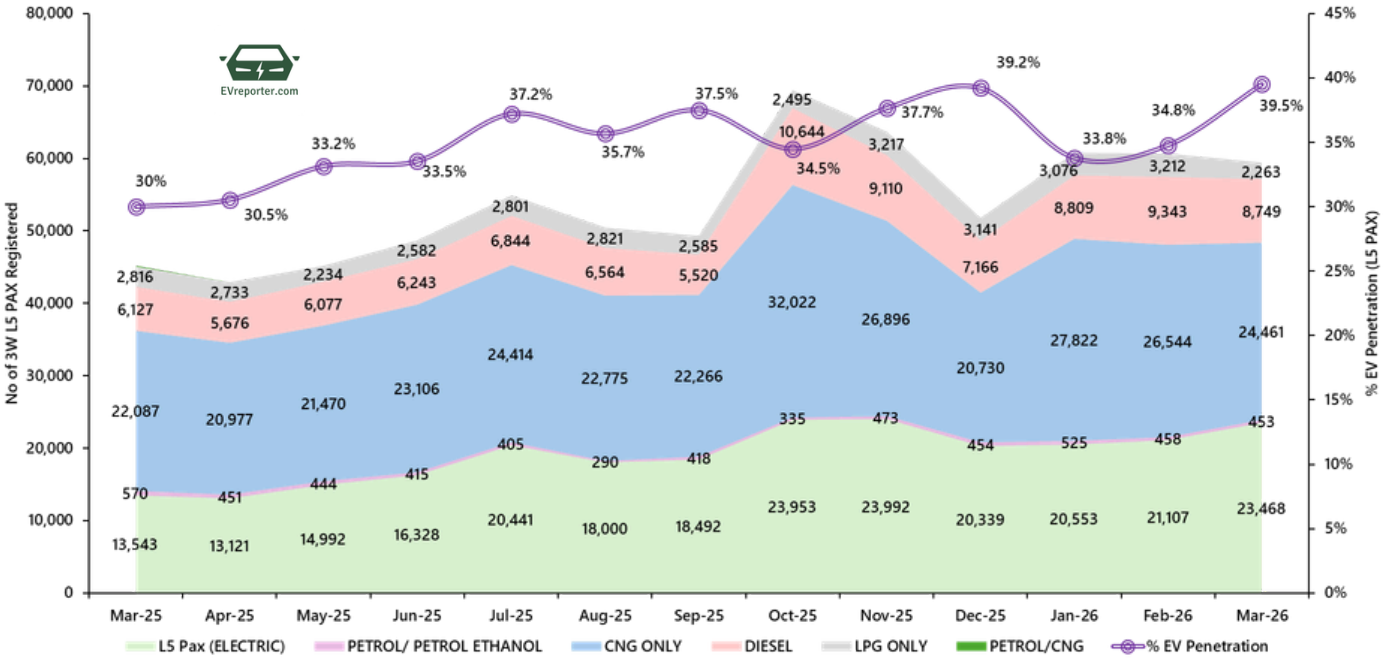


	% Growth (Y-o-Y)	% Growth (M-o-M)
TVS MOTOR	60.3%	54.7%
BAJAJ AUTO	31.4%	81.4%
ATHER	128.3%	71.5%
HERO MOTOCORP	166.8%	70.2%
OLA ELECTRIC	-57.2%	154.7%
AMPERE VEHICLES	40.6%	68.7%
RIVER MOBILITY	-	79.1%
BGAUSS AUTO	42%	52.4%
SIMPLEENERGY	-	122.1%
E-SPRINTO GREEN	-	28.4%

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

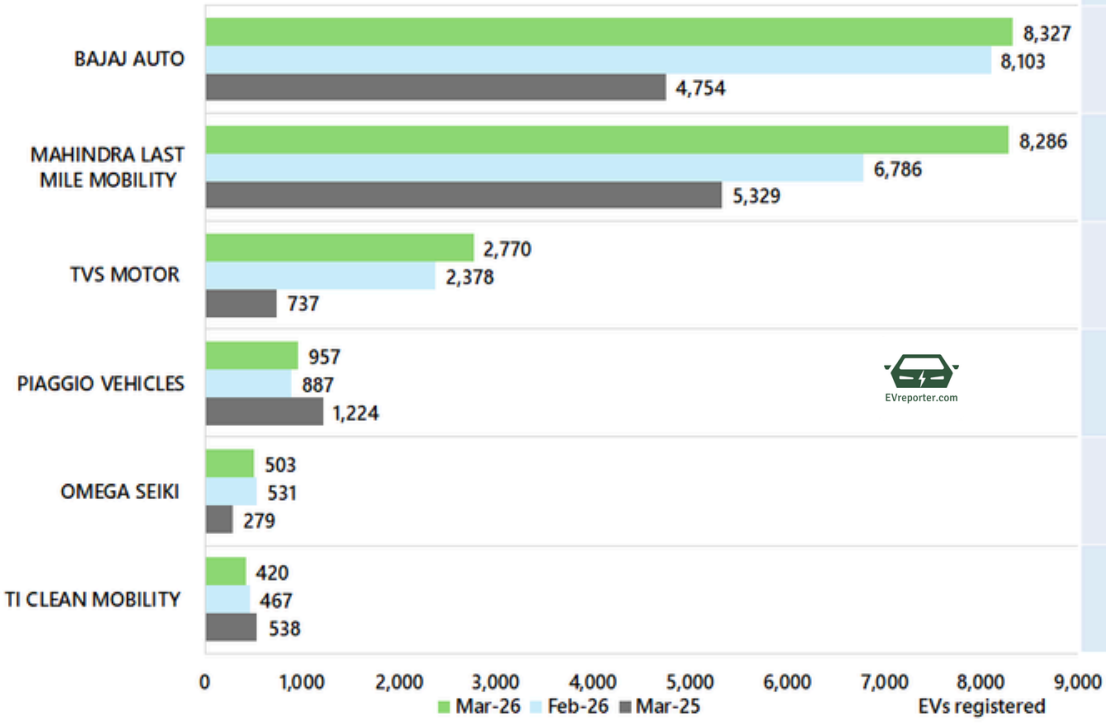
For EV sales, including Telangana data, state-wise, city-wise (70 cities), Top performing RTO data and OEM-wise performance, check out the EVreporter Data Portal here.

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



Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

E-3W L5 Passenger Sales | Leading OEMs



	% Growth (Y-o-Y)	% Growth (M-o-M)
BAJAJ AUTO	75.2%	2.8%
MAHINDRA LAST MILE MOBILITY	55.5%	22.1%
TVS MOTOR	-	16.5%
PIAGGIO VEHICLES	-21.8%	7.9%
OMEGA SEIKI	80.3%	-5.3%
TI CLEAN MOBILITY	-21.9%	-10.1%

Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

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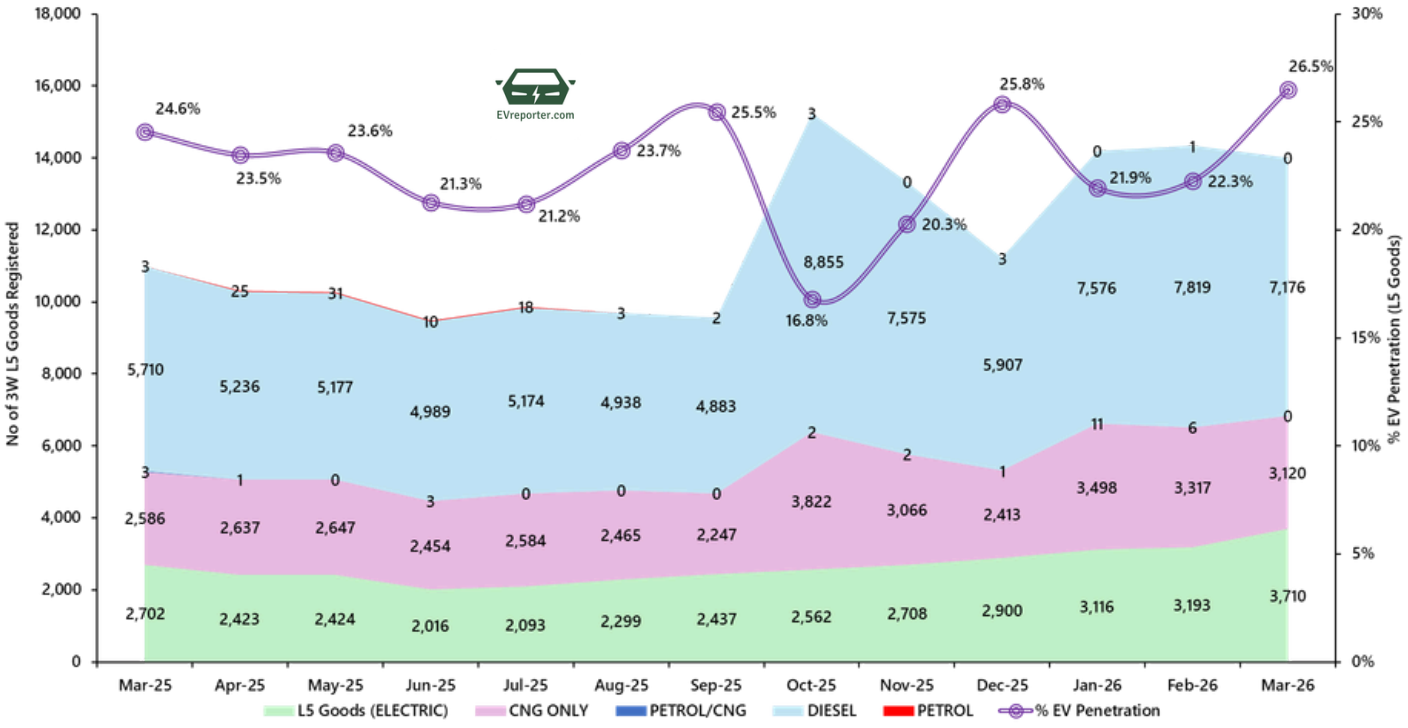
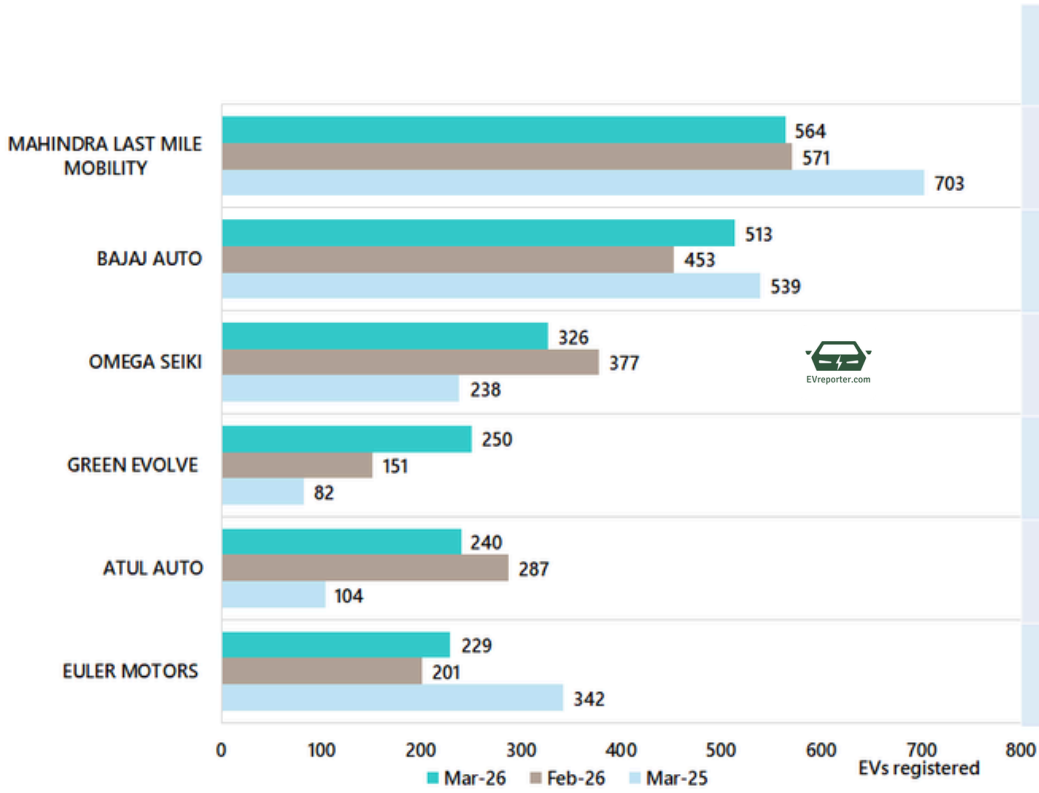
Fuel wise 3W **L5 Goods** Sales Trend | Mar 2025 - Mar 2026



Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

E-3W Goods L5 Sales | Leading OEMs

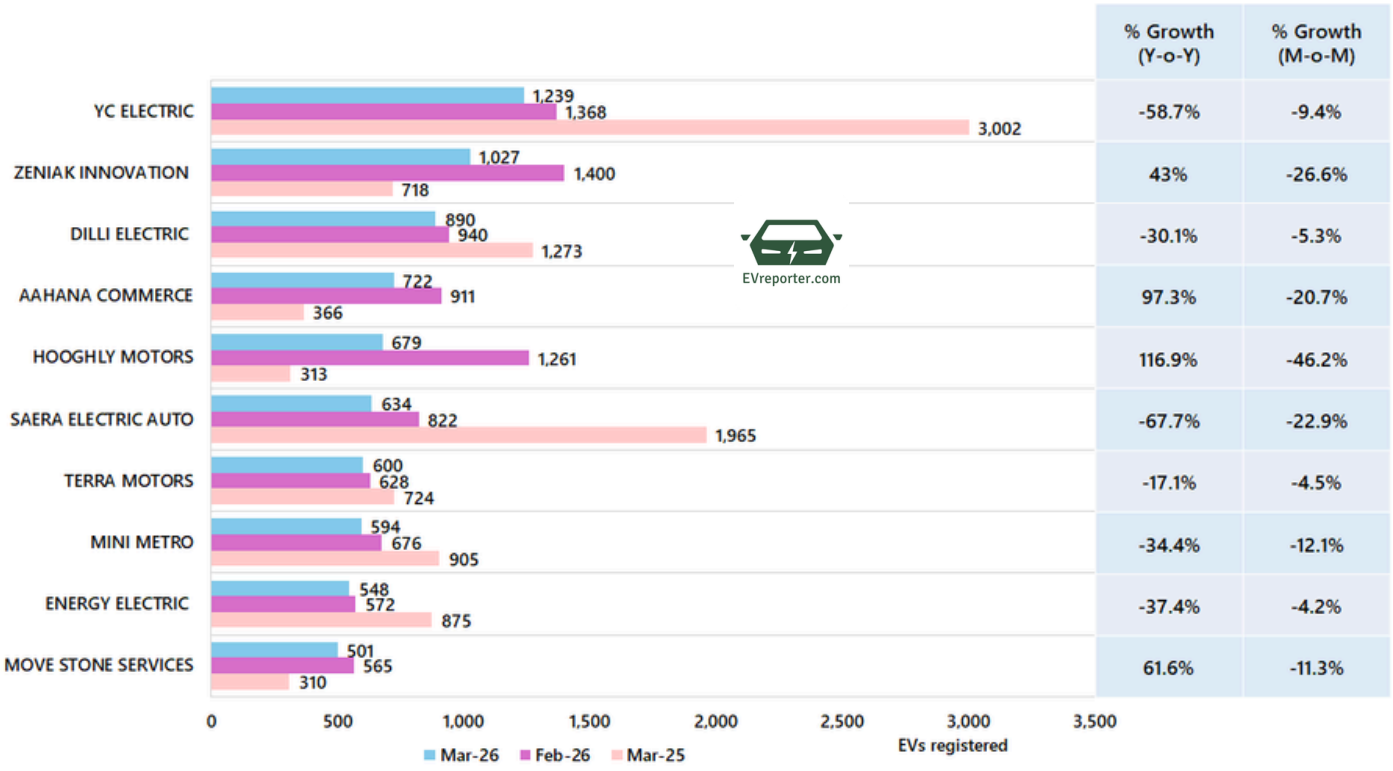


	% Growth (Y-o-Y)	% Growth (M-o-M)
MAHINDRA LAST MILE MOBILITY	-19.8%	-1.2%
BAJAJ AUTO	-4.8%	13.2%
OMEGA SEIKI	37%	-13.5%
GREEN EVOLVE	-	65.6%
ATUL AUTO	130.8%	-16.4%
EULER MOTORS	-33%	13.9%

Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

For EV sales, including Telangana data, state-wise, city-wise (70 cities), Top performing RTO data and OEM-wise performance, check out the EVreporter Data Portal here.

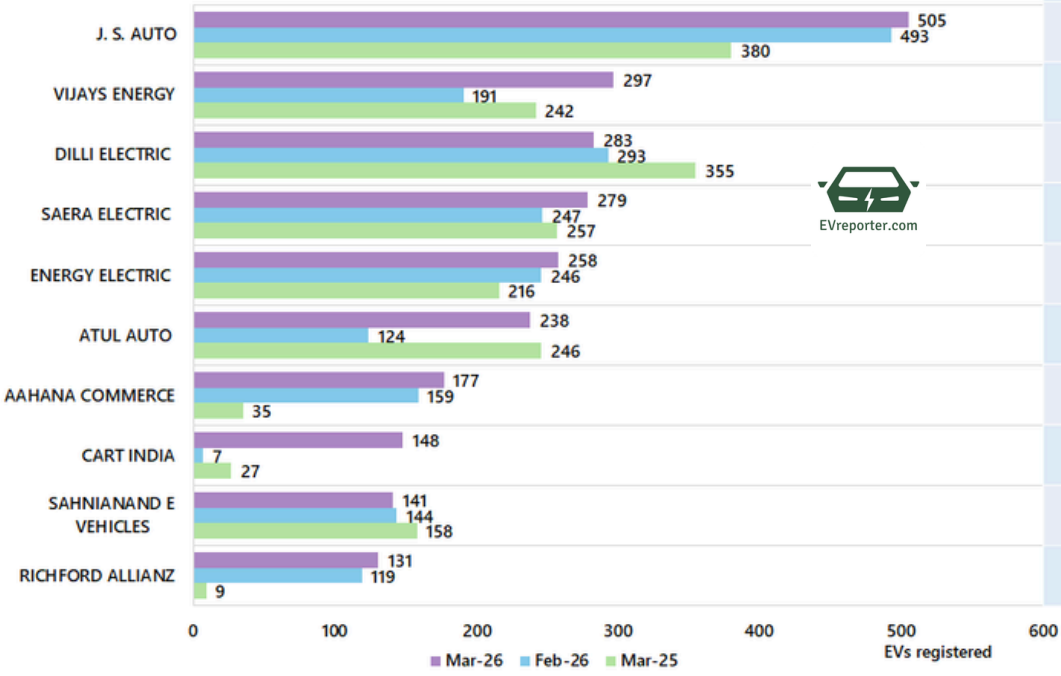
E-rickshaw Sales Trend by OEM | Mar 2026



	% Growth (Y-o-Y)	% Growth (M-o-M)
YC ELECTRIC	-58.7%	-9.4%
ZENIAK INNOVATION	43%	-26.6%
DILLI ELECTRIC	-30.1%	-5.3%
AAHANA COMMERCE	97.3%	-20.7%
HOOGHLY MOTORS	116.9%	-46.2%
SAERA ELECTRIC AUTO	-67.7%	-22.9%
TERRA MOTORS	-17.1%	-4.5%
MINI METRO	-34.4%	-12.1%
ENERGY ELECTRIC	-37.4%	-4.2%
MOVE STONE SERVICES	61.6%	-11.3%

Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

E-cart Sales | Leading OEMs | Mar 2026

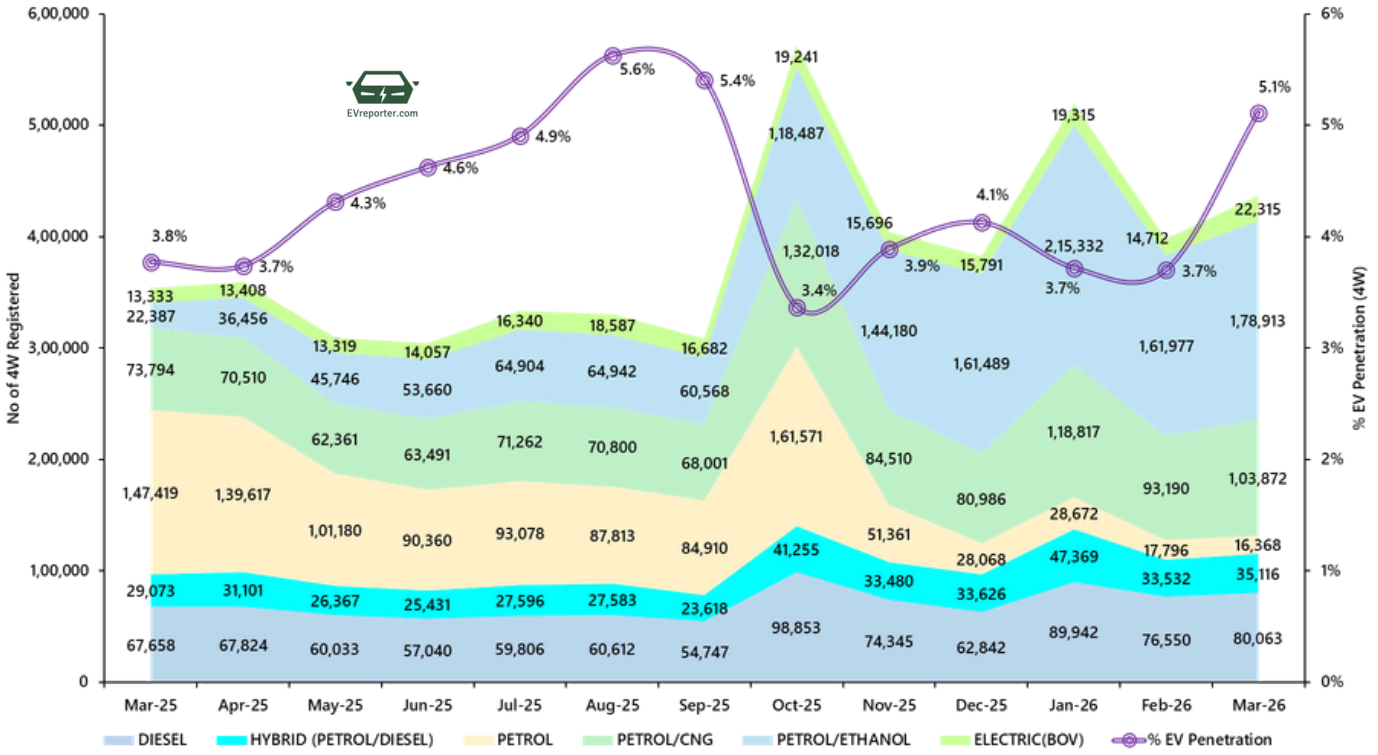


	% Growth (Y-o-Y)	% Growth (M-o-M)
J. S. AUTO	32.9%	2.4%
VIJAYS ENERGY	22.7%	55.5%
DILLI ELECTRIC	-20.3%	-3.4%
SAERA ELECTRIC	8.6%	13.0%
ENERGY ELECTRIC	19.4%	4.9%
ATUL AUTO	-3.3%	91.9%
AAHANA COMMERCE	-	11.3%
CART INDIA	-	-
SAHNIANAND E VEHICLES	-10.8%	-2.1%
RICHFORD ALLIANZ	-	10.1%

Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

For EV sales, including Telangana data, 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 | Mar 2025 - Mar 2026



Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

Electric Car Sales Trend by OEM | Mar 2026

S No.	Makers	Mar-26	Feb-26	Difference	% Change	Market Share Mar-26
1	TATA MOTORS	8,253	5,947	2,306	38.8%	37%
2	MAHINDRA & MAHINDRA	5,244	3,174	2,070	65.2%	23.5%
3	JSW MG MOTOR INDIA	5,141	3,556	1,585	44.6%	23%
4	MARUTI SUZUKI INDIA	949	223	726	325.6%	4.3%
5	VINFAST AUTO INDIA	691	415	276	66.5%	3.1%
6	HYUNDAI MOTOR INDIA	476	329	147	44.7%	2.1%
7	KIA INDIA	458	303	155	51.2%	2.1%
8	BMW INDIA	437	260	177	68.1%	2%
9	BYD INDIA	414	335	79	23.6%	1.9%
10	MERCEDES -BENZ AG	97	70	27	38.6%	0.4%
11	TESLA INDIA MOTORS	49	29	20	69%	0.2%
12	STELLANTIS AUTOMOBILES	30	14	16	114%	0.1%
13	OTHERS	76	57	19	33.3%	0.3%
	TOTAL	22,315	14,712	7,603	51.7%	100%

Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

Reach us at info@EVreporter.com with your custom automotive data requirements.

OEM wise Electric Bus Sales | Mar 2026

S No.	Makers	Mar-26	Feb-26	Difference	% Change	Market Share Mar-26
1	JBM ELECTRIC VEHICLES	206	151	55	36%	36.9%
2	SWITCH MOBILITY	161	280	-119	-42.5%	28.8%
3	PMI ELECTRO MOBILITY	123	83	40	48%	22%
4	PINNACLE MOBILITY	35	2	33	-	6.3%
5	AEROEAGLE AUTOMOBILES	22	20	2	10%	3.9%
6	AZAD INDIA MOBILITY	10	0	10	-	1.8%
7	TATA MOTORS	2	18	-16	-89%	0.4%
8	OLECTRA GREENTECH	0	20	-20	-100%	-
9	VE COMMERCIAL	0	4	-4	-100%	-
	TOTAL	559	578	-19	-3%	100%

Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

OEM wise E-Goods Carrier Sales | Mar 2026

S No.	Makers	Mar-26	Feb-26	Difference	% Change	Market Share Mar-26
1	TATA MOTORS	857	621	236	38%	45.5%
2	EULER MOTORS	469	293	176	60.1%	25%
3	MAHINDRA LAST MILE MOBILITY	268	230	38	16.5%	14.2%
4	SWITCH MOBILITY	96	79	17	21.5%	5.1%
5	TIVOLT ELECTRIC VEHICLES	86	68	18	26.5%	4.6%
6	VE COMMERCIAL	34	34	0	-	1.8%
7	IPL TECH ELECTRIC	23	18	5	27.8%	1%
8	ENERGY IN MOTION	21	16	5	31.3%	1.1%
9	SANY HEAVY INDUSTRY INDIA	10	23	-13	-56.5%	0.5%
10	ASHOK LEYLAND	6	10	-4	-40%	0.3%
11	OTHERS	15	66	-51	-77.3%	0.8%
	TOTAL	1,885	1,458	427	29.3%	100%

'Goods Carrier' refers to N1, N2, N3 cargo vehicles, including LCVs and HGVs, as categorised in Vahan dashboard.
Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

For EV sales, including e-goods carriers, Telangana data, state-wise, city-wise (70 cities), top-performing RTO data, and OEM-wise performance, check out EVreporter Data Portal here.

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EV Penetration for Different Vehicle Category Sales in India

Category	Mar-26	Feb-26	Mar-25
2W	9.8%	6.6%	8.7%
3W L5M	39.5%	34.8%	30%
3W L5N	26.5%	22.3%	24.6%
4W	5.1%	3.7%	3.8%
Goods Carrier	2.1%	1.6%	0.9%

Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

'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 Mar 2026 shows a significant rise in monthly sales volume from Feb.
- Mar 2026 EV penetration for 2Ws jumped to 9.8% (highest to date), up from 8.7% in Mar 2025. The passenger vehicle category recorded a 5.1% EV penetration, highest to date.
- **The L5 Passenger segment recorded its highest-ever EV penetration of 39.5%.**
- The Goods Carrier category is gradually gathering pace, with EV penetration rising to 2.1% from 0.9% the year before.
- **Bajaj Auto** attributed **21.4% of its March 2W sales to EVs**, while EV penetration for TVS 2Ws was 13.2%. 97.6% of **Mahindra Last Mile Mobility**'s (MLMM) passenger 3W sales were electric. Over 52% of TVS Motors' passenger 3W sales were electric.
- 82**% of JSW MG Motor India's** sales in Mar 2026 were EVs. EV penetration in the passenger car category stood at 12.6% for Tata Motors and **27.7% for BMW India.**

This section aims to showcase the part of EV sales for top-selling OEMs in the two-wheeler, three-wheeler and passenger vehicle categories.

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

S No.	Maker	Total Sales Mar-26	ICE	EV	% EV
1	HERO MOTOCORP	5,41,857	5,20,410	21,447	4%
2	HONDA MOTORCYCLE	4,75,313	4,75,173	140	0.03%
3	TVS MOTOR	3,74,602	3,25,267	49,335	13.2%
4	BAJAJ AUTO	2,16,253	1,69,981	46,272	21.4%
5	SUZUKI MOTORCYCLE	98,412	98,092	320	0.3%
6	ROYAL-ENFIELD	96,510	96,510	0	-
7	INDIA YAMAHA MOTOR	65,705	65,705	0	-
8	ATHER ENERGY	35,736	0	35,736	100%
9	OLA ELECTRIC	10,118	0	10,118	100%
10	AMPERE VEHICLES	7,973	0	7,973	100%

Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

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

S No.	Maker	Total Sales Mar-26	ICE	EV	% EV
1	BAJAJ AUTO	35,145	26,818	8,327	23.7%
2	MAHINDRA LAST MILE MOBILITY	8,489	203	8,286	97.6%
3	PIAGGIO VEHICLES	5,690	4,733	957	16.8%
4	TVS MOTOR	5,295	2,525	2,770	52.3%
5	ATUL AUTO	1,167	985	182	15.6%
6	OMEGA SEIKI	503	0	503	100%
7	TI CLEAN MOBILITY	420	0	420	100%
8	EULER MOTORS	197	0	197	100%

Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

For EV sales, including e-goods carriers, Telangana data, state-wise, city-wise (70 cities), top-performing RTO data, and OEM-wise performance, check out EVreporter Data Portal here.

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

S No.	Maker	Total Sales Mar-26	ICE	EV	% EV
1	BAJAJ AUTO	5,807	5,294	513	8.8%
2	PIAGGIO VEHICLES	2,953	2,785	168	5.7%
3	ATUL AUTO	1,554	1,314	240	15.4%
4	MAHINDRA LAST MILE MOBILITY	995	431	564	56.7%
5	OMEGA SEIKI	326	0	326	100%
6	GREEN EVOLVE	250	0	250	100%
7	TVS MOTOR	248	133	115	46.4%
8	EULER MOTORS	229	0	229	100%

Source: Vahan Dashboard as of Apr 2, 2026. Telangana Data not included.

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

S No.	Maker	Total Sales Mar-26	ICE	EV	% EV
1	MARUTI SUZUKI INDIA	1,72,742	1,71,793	949	0.5%
2	TATA MOTORS	65,652	57,399	8,253	12.6%
3	MAHINDRA & MAHINDRA	60,767	55,523	5,244	8.6%
4	HYUNDAI MOTOR	48,747	48,271	476	1%
5	KIA INDIA	28,096	27,638	458	1.6%
6	TOYOTA KIRLOSKAR MOTOR	27,374	27,374	0	-
7	SKODA AUTO VOLKSWAGEN INDIA	8,743	8,743	0	-
8	JSW MG MOTOR INDIA	6,268	1,127	5,141	82%
9	HONDA CARS INDIA	5,521	5,521	0	-
10	RENAULT INDIA	3,594	3,594	0	-
11	NISSAN MOTOR INDIA	2,542	2,542	0	-
12	BMW INDIA	1,580	1,143	437	27.7%
13	MERCEDES-BENZ INDIA	1,447	1,350	97	6.7%

Source: Vahan Dashboard as of Apr 2, 2026.

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Creating for Tomorrow

Engineering plastics solutions for E-mobility applications

XYRON™ modified polyphenylene ether [mPPE]

Solution for AIS156 Thermal Propagation & Fire Test

Excellent flammability class

Grade/UL94	V-0 (mmt)	5VA (mmt)
XYRON™ 340Z	0.75	**2.5**
XYRON™ 540Z	0.75	**2.5**
XYRON™ 443Z	0.75	**2.5**
XYRON™ G601Z	1.50	**2.0**

Burn Test for Li-B applications[4]

FR PC/ABS

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

XYRON™ 540Z

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

XYRON™ 443Z

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

[5]Advantages of XYRON™

Value proposition		Property	XYRON™	PC	PC/ABS
Energy efficiency due to low weight		Low specific gravity	●	●	●
Structural integrity for large and complex designs		Dimension stable	●	●	●
Battery Safety AIS-156	Fire resistance test with thin plate	Thickness[4]	●	●	●
	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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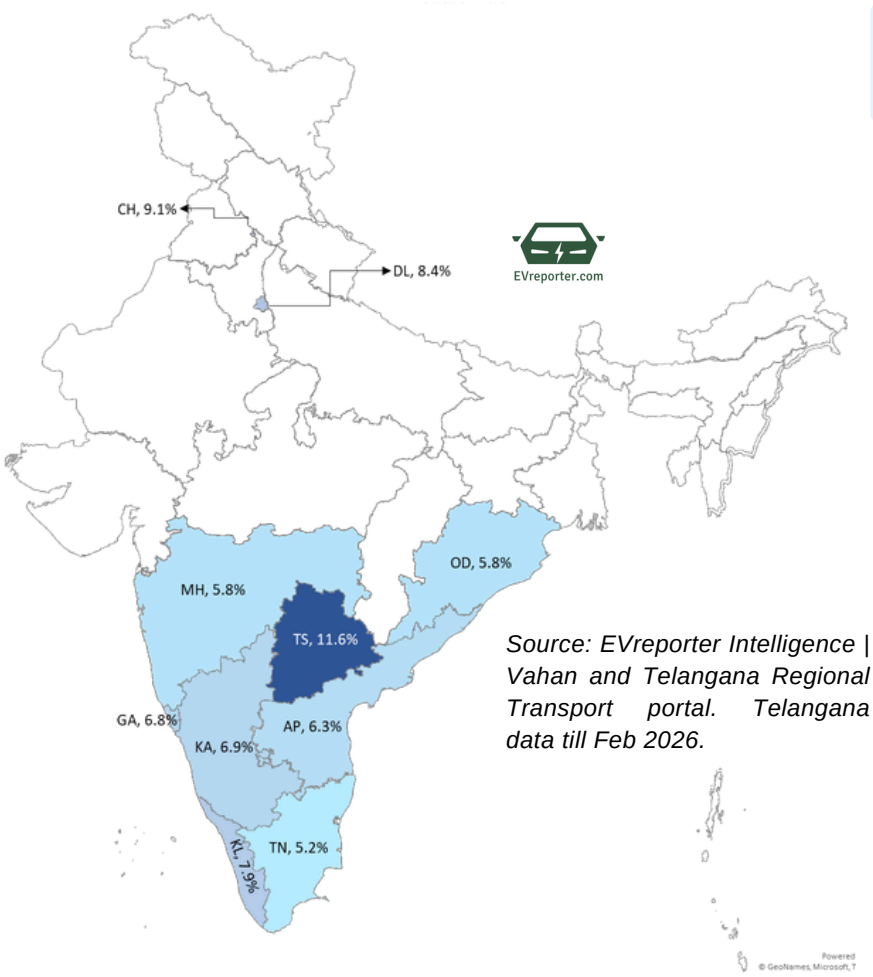
Electric Car Landscape in India | FY 2025-26

FY 2025-26 | States with Highest EV Penetration in Electric Car Category



Source: EVreporter Intelligence | Vahan and Telangana Regional Transport portal. Telangana data till Feb 2026.

4.5% Pan India EV Penetration in Passenger Vehicle category

- 4,839,508 cars were registered in India from April 2025 to March 2026, of which **219,484 were electric,** with a 4.5% EV share.
- Telangana **recorded the highest share in EV penetration of 11.6%** with 19,810 units e-4Ws sold (till Feb 2026), followed by **Chandigarh** with 9.1% (2,014 units) and **Delhi** with 8.4% penetration (16,986 units).

Top Selling States FY 25-26	Total 4W Sold FY 25-26	Total e-4W Sold FY 25-26	% EV Penetration
Telangana	170,524	19,810	11.6%
Chandigarh	22,125	2,014	9.1%
Delhi	201,411	16,986	8.4%
Kerala	257,088	20,226	7.9%
Karnataka	351,754	24,201	6.9%
Goa	24,803	1,688	6.8%
Andhra Pradesh	92,959	5,875	6.3%
Maharashtra	586,597	34,066	5.8%
Odisha	92,245	5,307	5.8%
Tamil Nadu	334,224	17,220	5.2%
Others	2,705,778	72,091	2.7%
Total	**4,839,508**	**219,484**	**4.5%**

- Kerala recorded an electric car penetration of 7.9%.
- Maharashtra recorded the highest EV sales volume, with 34,066 units, accounting for 15.5% of all e-4Ws sold in the country.
- Maharashtra was followed by Karnataka, with 11% EV share in India's electric car sales (24,201 units), and Kerala, with 9.2% share (20,226 units), in FY 25-26.

Source: EVreporter Intelligence | Vahan and Telangana Regional Transport portal. Telangana data till Feb 2026.

FY 2025-26 | Highest-selling EV OEMs in Electric Car Category

S No.	OEMs	Total e-4W sold	% Market Share
1	Tata Motors	85,367	38.9%
2	JSW MG Motors	58,661	26.7%
3	Mahindra Electric	47,316	21.6%
4	Hyundai Motors	6,419	2.9%
5	BYD India	6,264	2.9%
6	Kia India	4,252	1.9%
7	BMW India	3,943	1.8%
8	Vinfast	2,633	1.2%
9	Maruti Suzuki	1,434	0.7%
10	Mercedes-Benz	1,277	0.6%
	Others	1,918	0.9%
	Total	219,484	100%

Source: EVreporter Intelligence | Vahan and Telangana Regional Transport portal. Telangana data till Feb 2026.

- Tata Motors led the e-4W segment in FY25-26 with sales of 85,367 units and an overall 38.9% market share.
- JSW MG Motors secured second place with 26.7% market share (58,661 units), followed closely by Mahindra Electric 21.6% market share (47,316 units).
- In Maharashtra - the state that sold the highest number of electric cars, Tata Motors led the market with 11,790 units, followed by JSW MG Motors with 8,701 and Mahindra Electric with 8,101 units.
- In Karnataka, Tata Motors led the market with 8,348 units, followed by JSE MG Motors with 8,157 units.
- Compared to FY 24–25, this year, **Tata Motors recorded a 39.1% growth, MG Motor saw a 79.1% increase, and Mahindra witnessed a sharp surge of around 434% in respective electric car sales volumes.**
- Tesla sold 342 cars in FY25-26 in India.

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LFP Cell Authentication: Decoding the 24-Digit Identity

A 60-second authentication protocol that could save India's energy storage industry from a counterfeit crisis - An article By **Dr. Ravindra Kempaiah, CTO at Zenfinity Energy Pvt. Ltd.**

Zenfinity Energy is located at IIT Madras Research Park, Chennai, and works with BESS integrators and EV manufacturers across India's energy storage sector. This article is based on authentication protocols developed at Zenfinity Energy and shared as an industry resource. The complete visual guide is available through the company's LinkedIn page.

As lithium carbonate prices surge 80% in just 70 days and China tightens export restrictions, India's battery energy storage sector faces an unexpected threat: a flood of counterfeit and substandard LFP cells being pitched as "cost-effective alternatives."

With India targeting 250 GWh of BESS deployment by 2030 and most systems carrying 12-year performance guarantees, the stakes have never been higher. A single shipment of (A-) grade cells currently offered at 12-15% discounts across the supply chain can transform a profitable project into a warranty disaster within 18-24 months.

"We're seeing procurement teams under unprecedented cost pressure," says Dr. Ravindra Kempaiah, CTO at Zenfinity Energy and former researcher at Argonne National Lab and Dalhousie University. "When LFP cell costs increase 20-25% overnight, that 12% discount on A- grade cells looks attractive. But it's deferred catastrophic failure, and we are seeing a massive influx of such cells in L3 and L5 markets."

The Solution - A systematic authentication protocol that can verify any LFP prismatic cell in **under 60 seconds using its 24-digit QR code**, before those cells enter your battery system.

The Counterfeit Cell Crisis: Why Now?

India's rapid electrification of L3 and L5 vehicle segments has created massive demand for affordable battery solutions. Combined with recent lithium price spikes, this has triggered what industry experts describe as a "perfect storm" for the proliferation of counterfeit cells.

The current market dynamics:

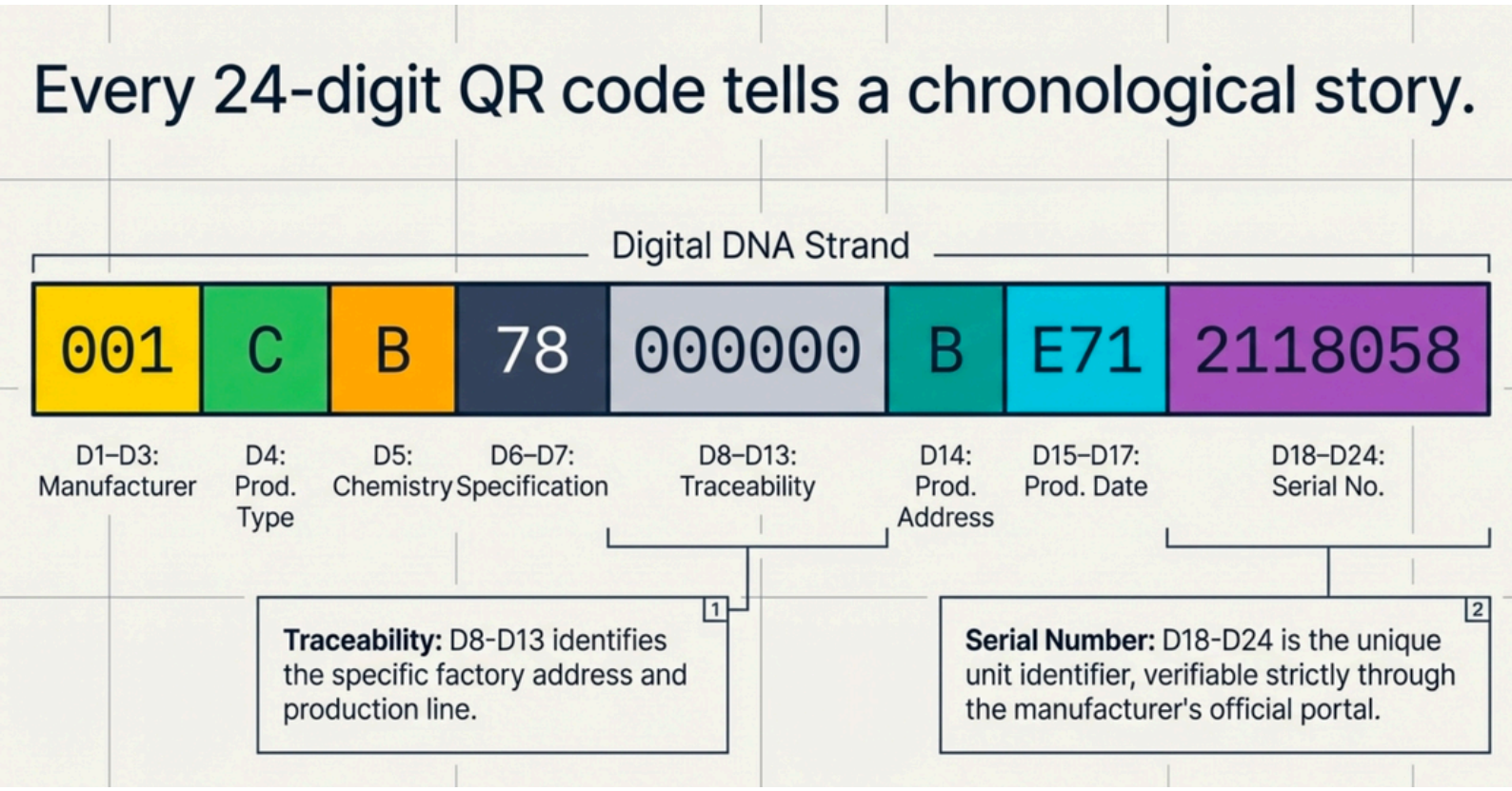
- Battery-grade Li_2CO_3: Up from ~₹9 lakh/ton (Nov 2025) to ₹22 lakh/ton (Feb 2026)
- LFP cell costs: Increased 20-25% in 60 days
- Manufacturer response: Pushing aged inventory and A- grade cells to maintain cash flow
- Procurement pressure: CFOs demanding cost reduction amid rising material prices

"The percentage of batteries requiring constant intervention to resolve imbalance issues is increasing day-by-day," notes Dr. Kempaiah. "Most of these failures trace back to mixed-grade cells that were never properly authenticated at receiving."

The consequences extend beyond individual projects. Counterfeit cells pose critical risks, including thermal runaway, capacity fraud (usable capacity often 20-30% lower than labelled), premature degradation, eliminating ROI within months of deployment and regulatory non-compliance.

With the EU Battery Passport (mandatory Feb 2027) and India's Battery Aadhar program (2025-26 rollout) requiring cell-level traceability, unverifiable cells will soon face customs rejection.

Decoding the 24-Digit Identity: Your First Line of Defence



Every authentic prismatic LFP cell carries a 24-digit QR code that provides complete traceability.

This string is divided into seven data segments, each revealing critical information.

D1-D3: Manufacturer Code (3 characters)

- Identifies the OEM brand. e.g. CATL (001), EVE Energy (040 or 04Q), BYD (009 or 00P)
- Complete reference covers 22 major manufacturers

D4: Product Type (1 character)

- C = Cell (individual electrochemical unit)
- P = Pack (integrated assembly with BMS)
- M = Module (grouped cell assembly)

D5: Chemistry Code (1 character)

- B = $LiFePO_4$ (LFP) - BESS & EV dominant, 3,000+ cycles, highest thermal safety
- C = LMO (Lithium Manganese Oxide) | D = LCO (Lithium Cobalt Oxide)
- E = NMC/Ternary (Ni-Mn-Co balanced) | G = LTO (Lithium Titanate)

For BESS applications, you're looking for 'B' in position 5. Any other chemistry is a red flag unless you've specifically ordered it.

D6-D7: Specification Code (2 characters)

- Manufacturer-defined technical specifications. Varies by OEM, cross-reference with datasheet

D8-D13: Traceability Code (6 characters)

- Factory address and production line identifier. Enables verification through manufacturer's portal

D14: Production Address (1 character)

- Specific facility within the manufacturer's network

D15-D17: Production Date (3 characters)

- Year: A=2020, B=2021, C=2022, D=2023, E=2024, F=2025...
- Month: 1-9 = Jan-Sep, A=Oct, B=Nov, C=Dec
- Day: 1-9 = 1st-9th, A=10th, B=11th... V=31st
- Example: E71 = E (2024), 7 (July), 1 (1st day) = July 1, 2024

D18-D24: Serial Number (7 characters)

- Unique unit identifier, verifiable through the manufacturer's traceability portal
- Critical for Battery Passport compliance

The Complete Manufacturer Reference

#	Brand	Code	#	Brand	Code
01	CATL	001	12	Tafel	08L
02	BYD	009/00P	13	Bak	005
03	CALB	0B5	14	Greatpower	02K
04	Gotion	03H	15	ZTE	002
05	SUNWODA	00P	16	Santon	031
06	EVE Energy	040/04Q	17	ETC	000
07	REPT	081	18	FST	004/044
08	SVOLT	090/09U	19	Henan Li-Mobility	060
09	Anchi	08N	20	Wanxiang	03N/010
10	Lishen	02C	21	Goshen	010
11	Farasis	0G4	22	Hithium	07H

D1-D3 codes for India's most commonly encountered LFP manufacturers

Note: Wanxiang and Goshen share code 010 - cross-check physical markings when either is suspected.

Instant Validation: Red Flags That Demand Rejection

Step 1: Locate & Combine the Code. Character count MUST be exactly 24 characters.

- Scan QR with Data Matrix reader app (available free on iOS/Android)
- If code spans two parts, combine them in the correct order
- Verify a complete 24-character string

Step 2: Validate Structure.

- Confirm exactly 24 characters
- Check Digit 4: Must be C, P, or M. Check Digit 5: Must be B, C, D, E, or G (B for BESS)
- Reject immediately on any structural deviation

Step 3: Decode All 7 Segments

- Verify manufacturer (D1-D3) against the approved supplier list
- Confirm chemistry (D5) matches the purchase order
- Check production date (D15-D17) is within the acceptable window
- Trace serial number (D18-D24) via the manufacturer portal
- Red flag: Portal returns no data or mismatched information

Step 4: Physical Cross-Verification

- **Confirm QR is laser-engraved (not painted)**. Authentic A-grade cells have laser-engraved QR codes with tactile texture, while counterfeits show flat white paint printing. Run a fingernail across the code-laser marks have depth, paint is smooth.

- **Verify QR position matches the cell datasheet.** A-grade codes are always in the datasheet-specified position, while B-grade indicators will show the original large QR code scraped off and a smaller code in a different location.

- Check that adhesive traces around the label are consistent.

- Measure cell weight (should match datasheet ±2%).
- For remote sourcing: Request a high-resolution QR photo before purchase.

Reject cells >18 months old (risk of capacity fade). Acceptable window in Mar 2026: Sept 2024 onwards (codes D9x through F3x). Codes earlier than D (2023) should raise concerns.

This protocol takes 60 seconds per cell sample, but it prevents 18 months of warranty nightmares. ***Grade is rarely labelled on packaging.*** *The QR code position, engraving quality, and traceability are your only reliable indicators.*

The Procurement Action Matrix: Grading and Verdicts

The Grade Spectrum Matrix

Grade	Specification Variance	QR Code Integrity	Expected Cycles	Deployment Recommendation
Grade A	Meets all specs ±2%, matched IR	Full-spec, laser-engraved in datasheet position, traceable	3,000+	TARGET: Always demand for BESS.
Grade A-	Minor spec/IR variance	Authentic, but shipped on price pressure	Drops 8–15% faster than A	AVOID: Often sold as Grade A at lower price.
Grade B	Cosmetic or minor electrical defects	Original QR scraped, replaced with smaller code at non-standard position	Heavy capacity fade within 300–500	REJECT: Unsuitable for grid deployment.
Grade B-	Refurbished, recycled, or fake	QR absent, painted, or returns no traceable URL data	Extreme thermal risk	HARD REJECT: Never deploy under any condition.

The Cascade Effect: When Mixed Grades Meet in a Battery Pack

Real-world scenario: 350V battery pack for electric bus

Module 1: Grade A cells (Jan 2024 production) | Module 2: Grade A- cells (Aug 2022 production, marketed as fresh) | Module 3: Relabeled B-grade cells (original QR scraped). **Timeline of failure:**

- Month 1: BMS shows balanced voltages (appears normal)
- Month 6: Module 3 sags under load → BMS throttles entire pack → 18% range loss
- Month 12: Module 2 develops high IR → 40% longer charging time → thermal management runs constantly
- Month 18: Module 1 is still performing to spec, but the pack retired due to Module 2 & 3 failures

Result: 33% of good cells were discarded because procurement didn't verify the grades.

In RESS and EV applications, pack performance is limited by your weakest module. Mixed-grade cells don't average out-they cascade down. This is why L3 and L5 vehicles in India are seeing such high battery imbalance rates. Even the best BMS design can't compensate for counterfeit cells with falsified QR codes. Authentication is everyone's responsibility, from procurement to policy.

Looking Ahead: Authentication as Infrastructure

As India scales battery manufacturing and deployment, from 2/3-wheelers to grid-scale storage, cell authentication must evolve from a quality checkpoint to a critical infrastructure. **In 2027, when Battery Passport and Battery Aadhar are fully enforced, unverifiable cells won't just be risky-they'll be illegal**. The procurement teams building authentication capability today are future-proofing their operations. Those waiting for regulatory enforcement are setting themselves up for customs rejections and project delays.

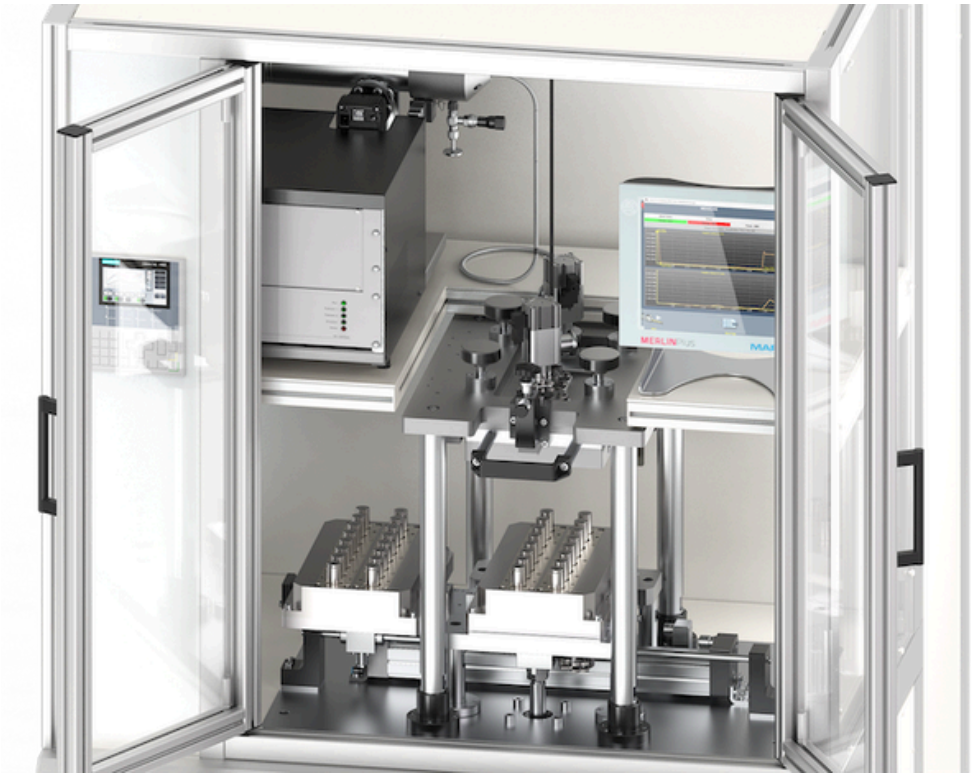
The 24-digit QR code isn't just a label. It's a warranty and a promise. Learn to read it.

About the author

Dr. Ravindra Kempaiah received his PhD from the University of Illinois, Chicago, where he worked on manganese-based cathode materials with scientists at Argonne National Laboratory. He completed his post-doctoral research with Dr Jeff Dahn at Dalhousie University, Canada. In Canada, he founded Zen Energy Inc. to develop micromobility batteries before returning to India to contribute to the nation's energy transition.

MARPOSS LEAK B-TRACER - A GAME CHANGER FOR E-MOBILITY BATTERY SAFETY

The E-Mobility revolution is taking the world by storm, but its success depends on one crucial element: safe and reliable Lithium-ion batteries. These powerful batteries propel electric vehicles, but they often contain flammable electrolytes that pose a safety risk if they leak. Leaks can also lead to a rapid decline in battery performance, reducing driving range and overall efficiency.



***Marposs**, a company dedicated to innovation in manufacturing, has introduced a game-changing solution:*

The Leak B-TRACER

*This revolutionary semi-automatic station offers **comprehensive leak testing throughout the battery assembly process**, ensuring the integrity and safety of every battery cell.*

Double-Edged Sword: Uncompromising Leak Detection

The Leak B-TRACER takes a two-pronged approach to leak detection for unmatched reliability:

- **Pre-filling Leak Detection**: Before the battery cell is filled with the electrolyte and sealed, the Leak B-TRACER leverages a tried-and-tested method – **helium leak detection within a vacuum chamber**. Here, the system introduces helium gas into the empty cell. A highly sensitive mass spectrometer then meticulously identifies and measures any leaks, ensuring the cell is in perfect condition before filling.

- **Electrolyte Tracing - A Pioneering Post-Filling Inspection:** Marposs doesn't stop there. They have introduced a groundbreaking Electrolyte Tracing technique for leak detection after the cell is filled and sealed. In the unfortunate event of a leak, the Leak B-TRACER vaporizes and extracts the electrolytes within the controlled environment of the vacuum chamber. A specially calibrated mass spectrometer then analyses the extracted vapor, quantifying the leak rate with exceptional precision. This vital information allows manufacturers to identify and address even the most minute leaks before defective batteries enter the production line.

Seamless Integration for Maximum Efficiency

Designed for seamless integration into existing production lines, the Leak B-TRACER offers a user-friendly, **semi-automatic operation**. Operators manually load the battery cells, and the system takes care of the rest with its automated testing cycle. This makes the Leak B-TRACER ideal for a variety of tasks, including:

- **Prototype and Pilot Line Testing**: During the development phase of new battery designs, the Leak B-TRACER plays a vital role in ensuring the integrity of early prototypes.
- **Random Off-line Testing and Statistical Process Control (SPC) Analysis:** Manufacturers can perform regular quality checks throughout production runs using the Leak B-TRACER. This helps identify any potential issues in the assembly process and implement corrective measures to ensure consistent quality.
- **Re-checking of Scrap Batches:** Even the most advanced manufacturing processes can produce defective batches. The Leak B-TRACER allows for efficient re-checking of scrap batches, helping to salvage usable cells while identifying the root cause of the initial failure.

Unmatched Versatility: A Champion for Multiple Battery Applications

The Leak B-TRACER demonstrates exceptional versatility, accommodating various battery cell formats. **Whether you're working with button, cylindrical, prismatic, or pouch cells, the Leak B-TRACER can handle them all.** Furthermore, the system is adaptable for integration at different stages of the battery building process, including pre and post-filling, as well as end-of-line testing. This flexibility makes it a valuable asset for any manufacturer producing lithium-ion batteries for a wide range of applications.

Fast Retooling and User-Friendly Design: Minimizing Downtime

Marposs prioritizes ease of use with the Leak B-TRACER. The system features a **rapid retooling kit that ensures minimal downtime during production line changeovers**. This allows manufacturers to quickly switch between different battery cell formats without sacrificing production efficiency.

Marposs: Pioneering a Safe and Sustainable E-Mobility Future

The Leak B-TRACER is a testament to Marposs' unwavering dedication to advancing E-Mobility. This innovative solution ensures battery safety and performance, paving the way for a more reliable and secure future for electric vehicles. By safeguarding battery integrity, the Leak B-TRACER fosters trust in E-Mobility technology, accelerating the transition towards a cleaner and more sustainable future.

Contact Marposs

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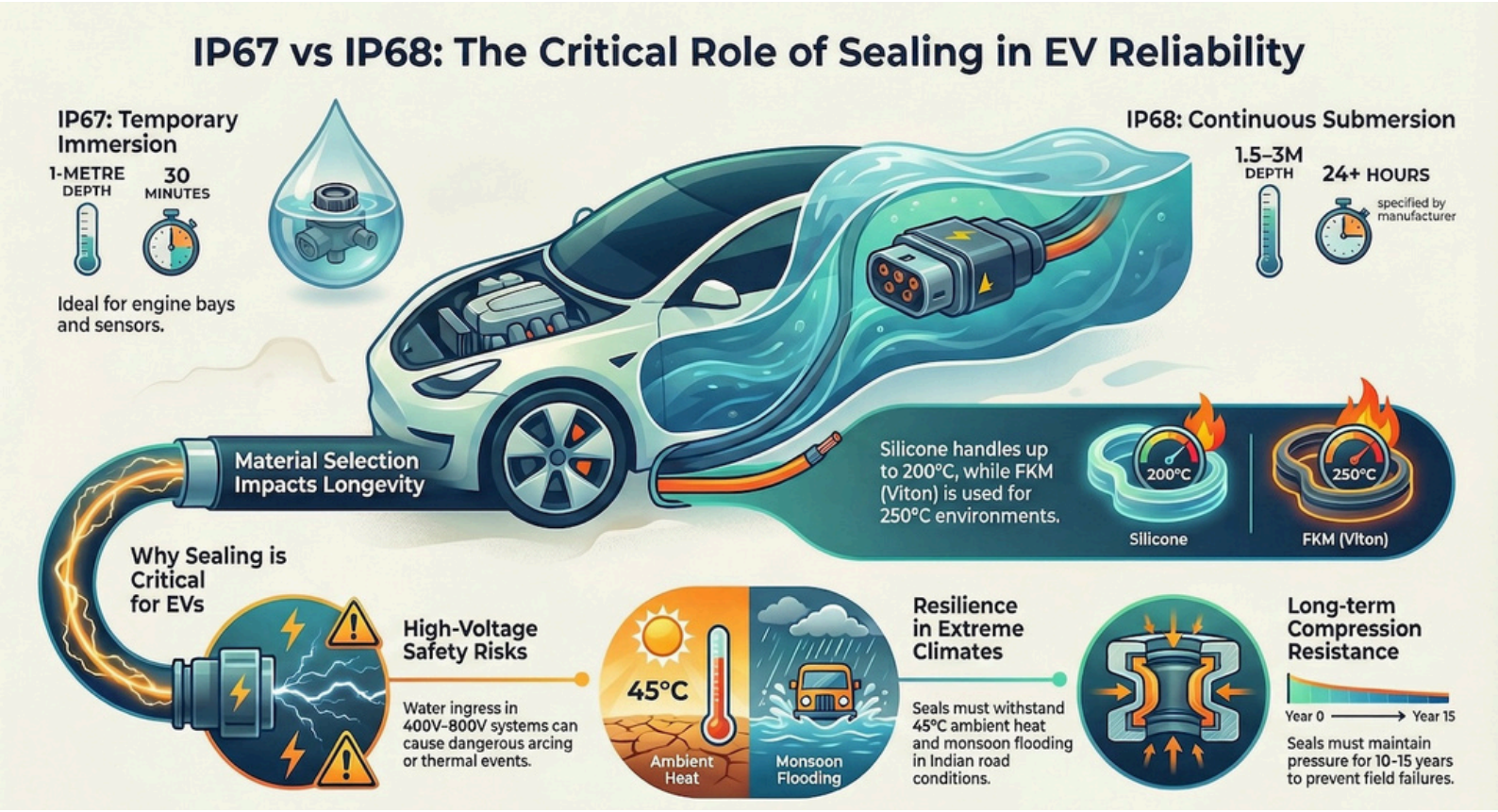
- **+91 124 473 5776**
- **sales@in.marposs.com**



IP67 vs IP68 in EV Connectors: What it Actually Means in Real-world Conditions

Every EV that rolls off a production line carries hundreds of electrical connectors. Some are tucked safely inside the cabin. Others sit exposed to monsoon rain, road splash, underbody pressure wash, and the relentless heat of Indian summers. The connectors themselves get a lot of engineering attention, but the rubber seals inside them — the components that actually keep water out — are rarely discussed outside the wiring harness community.

*This article by **Amitoj Singh Luthra** from ARPL (ASEAN Rubber Pvt. Ltd.) explains what IP67 and IP68 protection ratings really mean for EV connector sealing, why the distinction matters more in electric vehicles than it ever did in ICE vehicles, and what engineers and procurement teams should look for when specifying connector seals for EV applications.*

What do IP67 and IP68 actually test?

Parameter	IP67	IP68
Water test	Temporary immersion: 1 metre depth for 30 minutes	Continuous submersion: depth and duration specified by manufacturer (typically 1.5–3 m for 24+ hours)
Dust test	Complete dust-tightness (IP6X)	Complete dust-tightness (IP6X)
Typical EV use	Engine bay connectors, underbody sensors, exterior lighting	Battery pack connectors, submerged sensors, charging inlets
Seal requirement	Standard multi-lip single wire seals with 50–60 Shore A hardness	Enhanced seals with tighter tolerances, higher compression set resistance, dual-seal designs

The IP (Ingress Protection) code, defined by IEC 60529, is a two-digit rating system. The first digit rates solid particle protection (dust), and the second digit rates water protection. Both IP67 and IP68 share a first digit of 6, meaning complete dust-tightness — no ingress of dust whatsoever under sustained low-pressure conditions. The difference lies in the second digit, and this is where things get interesting for EV applications.

There is also IP6K9K, which tests resistance to high-pressure, high-temperature water jets (80°C at 80–100 bar). This is increasingly specified for underbody connectors on EVs that will be exposed to commercial wash bays or pressure cleaning.

Why does this matter more for EVs than ICE vehicles?

In a conventional ICE vehicle, a connector failure due to water ingress might cause a warning light or a malfunctioning sensor. Inconvenient, but rarely dangerous. In an EV, the stakes are fundamentally different.

Battery pack connectors operate at voltages between 400V and 800V in modern EVs. Water ingress into a high-voltage connector does not just cause corrosion — it creates a potential safety hazard, including the risk of short circuits, thermal events, and high-voltage arcing. This is why battery management system (BMS) connectors, high-voltage interlock (HVIL) connectors, and battery junction box connectors almost universally require IP68 or higher ratings.

Charging inlets are another critical area. Unlike any connector in an ICE vehicle, the charging port is regularly exposed to direct rainfall, dust storms, and humidity while the vehicle is parked outdoors. In Indian conditions, where monsoon rain can pool around a parked vehicle for hours, IP68-rated sealing of the charging inlet connector is not optional — it is a safety requirement.

Motor and inverter connectors sit in the thermal zone near the electric drivetrain, where temperatures can exceed 150°C during sustained high-power operation. Here, the challenge is not just water resistance but maintaining seal integrity at high temperatures over the 10–15 year life of the vehicle.

The seal is where IP ratings succeed or fail

A connector housing can be perfectly designed, but if the rubber seals inside it are not up to specification, the entire assembly will fail its IP rating. The sealing system inside a typical automotive connector has three critical elements:

Single wire seals (SWS): These small, precision-moulded rubber components fit around each individual wire as it enters the connector cavity. A typical automotive connector may contain anywhere from 2 to 36+ individual wire seals. Each one must create a reliable compression seal against both the wire insulation and the cavity wall. A single defective seal out of 36 will compromise the IP rating of the entire connector.

Cavity plugs (dummy seals): Every unused cavity in a sealed connector must be plugged. If even one empty cavity is left open, water will find its way in. In EV applications, where connector housings often have spare cavities for future sensor integration or variant configurations, cavity plug management is a frequent source of field failures.

Interfacial (mat) seals: These larger seals sit at the mating face between connector halves and seal the peripheral boundary. For IP68 applications, dual-seal architectures — combining both individual wire seals and a peripheral mat seal — are increasingly common.

Material selection for EV connector seals

The choice of elastomer material directly determines how long a seal will maintain its IP rating under real-world conditions. The Indian operating environment — with ambient temperatures regularly exceeding 45°C, high humidity during monsoon months, and exposure to road salt and chemicals — makes material selection particularly critical.

- **Silicone (VMQ/LSR) is the most widely used material for EV connector seals**. It operates reliably from -55°C to +200°C, has excellent UV and ozone resistance, and maintains its compression set properties over decades. Liquid Silicone Rubber (LSR) grades enable high-speed injection moulding for mass production, while self-lubricating (oil-bleeding) variants reduce wire insertion force for automated harness assembly.

- **FKM (Viton)** is specified for the most **demanding EV applications** — motor connectors, inverter connections, and locations exposed to aggressive automotive fluids. FKM withstands temperatures up to 250°C and offers exceptional chemical resistance, but comes at a higher cost.

- **EPDM** offers excellent weathering resistance at a lower cost point and is suitable for **exterior connectors not exposed to petroleum-based fluids**. It is commonly used in lighting connectors, sensor harnesses, and body electronics.

- **NBR** provides strong resistance to oils and fuels but has a narrower temperature range (-40°C to +120°C). In EVs, its use is primarily limited to **connectors in the thermal management system** where coolant fluid compatibility is required.

Indian EV context: where are the pain points?

India's EV market is scaling rapidly, with electric two-wheeler and three-wheeler registrations growing at over 40% year-on-year. As production volumes increase, so does the pressure on component quality. Several real-world challenges are specific to the Indian operating environment:

- **Monsoon flooding:** Vehicles in cities like Mumbai, Chennai, and Kolkata regularly encounter water-logged roads with **standing water depths of 300–500 mm**. Battery pack connectors must maintain IP68 sealing even during temporary submersion events that exceed standard test conditions.

- **Extreme heat:** Ambient temperatures in Rajasthan, central India, and southern coastal regions routinely exceed 45°C. Combined with heat from the battery and drivetrain, **connector seal temperatures can reach 80–90°C** even in non-underhood locations. Silicone-based seals are essential in these zones.

- **Dust and particulate exposure**: Indian road conditions generate significantly **higher dust loads** than European or Japanese test environments. The '6' in IP67/IP68 (complete dust-tightness) is not a luxury — it is a baseline requirement for any exposed connector.

High-pressure wash exposure: Fleet EVs (delivery vehicles, ride-hailing cars, electric buses) undergo frequent commercial wash cycles. IP6K9K-rated sealing for underbody and wheel-well connectors is becoming a standard requirement for fleet applications.

What should the procurement teams look for?

When evaluating connector seals for EV applications, engineering and procurement teams should consider these factors beyond just the IP rating number:

- **Compression set resistance**: A seal that passes IP68 testing on day one but loses 30% of its compression force after five years of thermal cycling is not truly IP68-rated for the life of the vehicle. **Request long-term compression-set data**, not just initial IP test results.

- **Flash control**: Excess rubber flash on seal lips directly compromises sealing performance. Manufacturers using cryogenic deflashing technology produce cleaner seals with more consistent lip geometry.

- **Dimensional consistency**: Connector seal cavities have tolerances of ±0.05 mm. Consistent part-to-part dimensional accuracy (Cpk > 1.67) is essential, especially at high production volumes.

- **Certification**: IATF 16949:2016 certification is the baseline for any seal supplier serving the automotive industry. It ensures documented manufacturing processes, statistical process control, and traceability.

- **Harness automation readiness**: As EV harness production scales up, seals must be compatible with automated wire insertion equipment. Self-lubricating silicone grades reduce insertion force by 40–60%, enabling production speeds of 2,000+ insertions per hour.

The bigger picture

As India's EV ecosystem matures, the industry is moving beyond simply specifying an IP rating on a drawing and assuming the problem is solved. The real question is not "is this connector IP67 or IP68?" but rather "will this sealing system maintain its protection rating under Indian operating conditions for the entire life of the vehicle?"

The answer depends on the combination of seal material, manufacturing precision, quality systems, and understanding of the actual field conditions the connector will face. As EV production volumes in India continue their rapid growth, getting the connector sealing right at the component level will be one of the less visible but most impactful quality differentiators in the market.

About the author

Amitoj Singh is the Director of Growth & Market Expansion at ARPL (Asean Rubber Pvt. Ltd.), an ISO 9001:2015 and IATF 16949:2016 certified rubber manufacturer based in IMT Manesar, Gurugram. With over 30 years of manufacturing expertise, ARPL specialises in automotive connector seals, single wire seals, O-rings, grommets, and custom rubber components, serving OEMs and Tier-1 wiring harness manufacturers across India, USA, Germany, Japan, South Korea, and 15+ countries.

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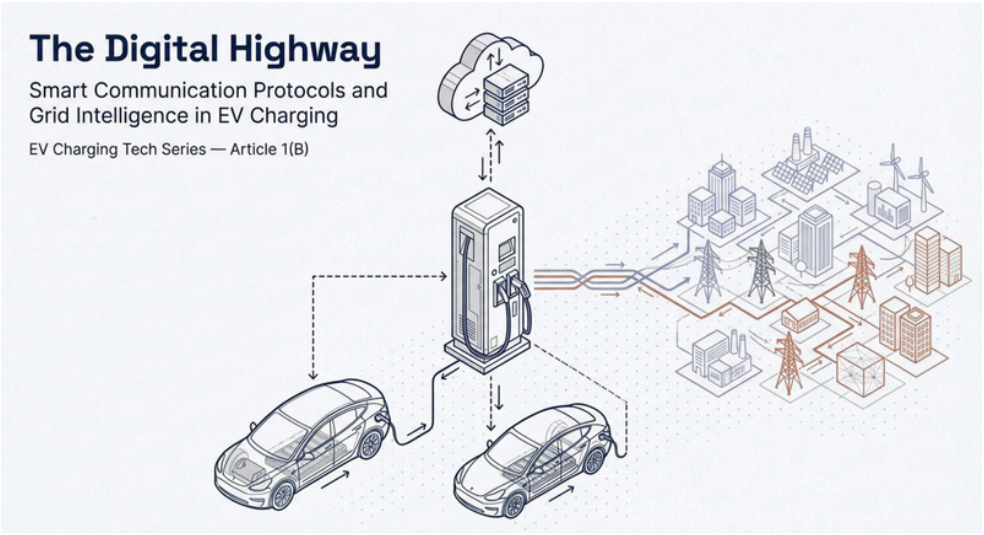
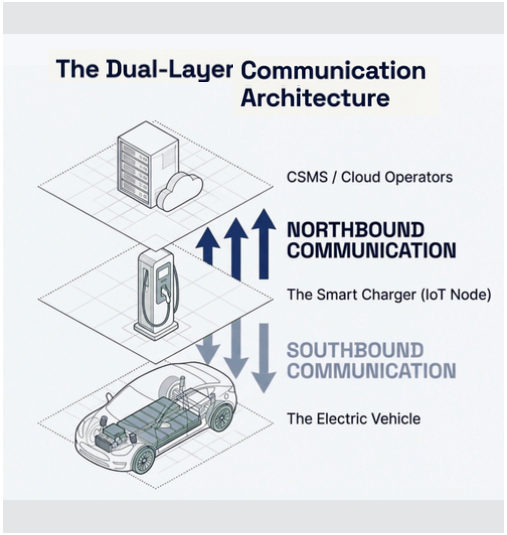




The Digital Highway: Smart Communication Protocols and Grid Intelligence in EV Charging

EV CHARGING TECH SERIES - ARTICLE 1(B)

Article 1 of this Series can be accessed in EVreporter Mar 2026 issue or our website.

EV charging is evolving beyond simply installing more plugs. The focus is now on creating a **digital energy network** that coordinates vehicles, chargers, utilities, and the grid in real time.

This shift from hardware alone to integrated intelligence means that **smart chargers,** which communicate with vehicles, respond to grid conditions, and manage power dynamically, are becoming as essential as the charging cable itself.

*This article by **Alekhya Vaddiraj** examines communication standards and protocols that transform chargers from passive outlets into active, intelligent components of the grid.*

Why Communication Matters

A charging station today is a networked IoT device — governed by multiple overlapping communication layers. Communication transforms basic charging hardware into smart, connected, and efficient chargers.

Modern networks, with more renewables and connected devices, require:

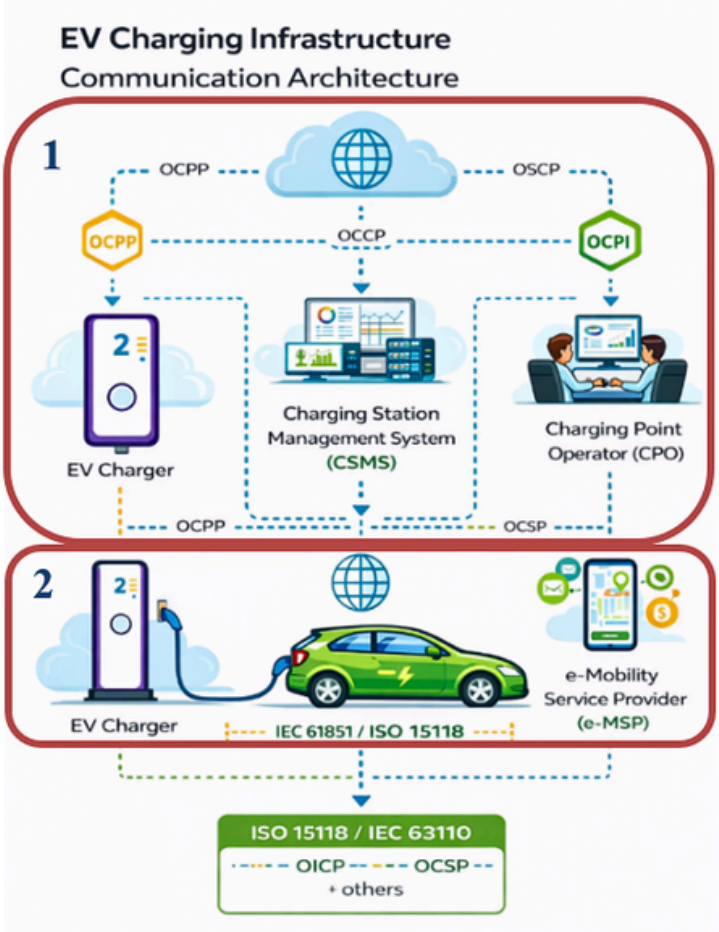
- Load management: Distribution and management of energy without overloading feeders.
- Authentication: Verification and authorization of devices and sessions.
- Payment & Billing: Secure user transactions.
- Data Logging: Track usage, performance, and predictive maintenance.

Today's charging stations function as networked IoT devices, managed by multiple overlapping communication layers.

Core Family of Protocols Enabling EVs

Protocols and standards for EV charging can be broadly categorized into two communication layers.

- The first layer is **charger-to-backend communication**, which allows operators to monitor performance, control sessions remotely, and manage billing and diagnostics.
- The second layer is **charger-to-vehicle communication,** enabling features such as Plug & Charge, real-time charging schedules, and future bidirectional energy flow.



1. Charger to Backend Operator/s

OCPP — Open Charge Point Protocol

- A De facto global open standard enabling **chargers to communicate with the CSMS** (Charging Station Management System). Developed by the Open Charge Alliance, versions 1.6 & 2.0.1 are widely used.
- Communicates via WebSocket-based **JSON data exchange.**
- **Functions**:
  - Remote start/stop of sessions
  - Smart load management
  - Diagnostics and fault reporting
  - Energy usage records
  - Firmware updates

OCPI — Open Charge Point Interface

- This open protocol supports EV roaming, data exchange, and interoperability, allowing drivers to use any charger regardless of their subscription, similar to mobile network roaming.
- Developed by the EVRoaming Foundation, it enables EMPs and CPOs to collaborate, enhancing user convenience.
- OCPI, combined with the Open Clearing House Protocol (OCHP), establishes a **roaming network** by defining a centralized clearing house and outlining how multiple charging stations or operators exchange information such as location, availability, pricing, authentication, session details, and billing.

OSCP — Open Smart Charging Protocol

- This emerging protocol is designed to **support EV grid integration**.
- It manages electric flow between the distribution network and charging stations.
- The protocol focuses on energy management between grid operators and charging providers.
- It transmits future capacity data in 15-minute intervals, helping to prevent overloads and support grid load management.

Protocol	Primary Function	Key Mechanisms	Grid Role
OCPP (Open Charge Point Protocol)	De facto global standard for charger-to-CSMS communication (v1.6 & 2.0.1).	WebSocket-based JSON exchange, remote start/stop, firmware updates, fault diagnostics.	Enables smart load management from the backend.
OCPI (Open Charge Point Interface)	The roaming enabler for EMPs and CPOs.	Exchanging location, pricing, and billing data via centralised clearing houses (OCHP).	Creates a seamless, unified driver experience across fragmented networks.
OSCP (Open Smart Charging Protocol)	The grid integrator.	Manages energy flow between distribution networks and charging providers.	Transmits capacity data in 15-minute intervals to proactively prevent grid overloads.

> *These protocols define northbound communication between the charger and the cloud, rather than between the charger and the vehicle.*

2. Charger-to-Vehicle Protocols

- **IEC 61851 -** This standard provides low-level electrical safety and signalling through a basic control pilot signal, using Pulse Width Modulation (PWM).
- **ISO 15118 -** ISO 15118 enables high-level communication between EVs and charging equipment (EVSE), supporting Plug & Charge and vehicle-to-grid (V2G) capabilities.
    - **Plug & Charge**: Vehicle auto-authenticates via digital certificate; no cards/apps needed.
    - **Smart Charging**: Exchanging real-time charging schedules.
    - **Bidirectional Energy Flow (V2G):** Communicates grid state, battery SOC, and desired power direction.

> These standards enable EVs to function as smart devices that can provide grid services.

Smart Charging & AI Integration

Smart charging combines **energy management logic** with **user demand forecasting.**

- **Dynamic load balancing**: Charging rates are adjusted so that if one vehicle requires less power, others can utilize the available capacity.
- **Time-of-day optimization**: AI shifts charging to periods of low demand or lower tariffs.
- **Predictive maintenance**: Voltage and temperature sensor data is analyzed in the cloud to anticipate maintenance needs.

V2G and V2H (Vehicle-to-Home):

- EVs serve as mobile energy storage assets:
  - Feed power back into a home, reducing grid purchases.
  - They can respond to utility frequency regulation and grid balancing events.

Cybersecurity and Data Privacy

As chargers become more advanced, cybersecurity becomes increasingly important.

- TLS 1.3 Encryption in OCPP 2.0.1 prevents man-in-the-middle attacks.
- Digital certificates authenticate chargers and vehicles in ISO 15118.
- Firmware signing & verification prevent malicious updates.
- Edge security modules enable anomaly detection and hardware-level access control.

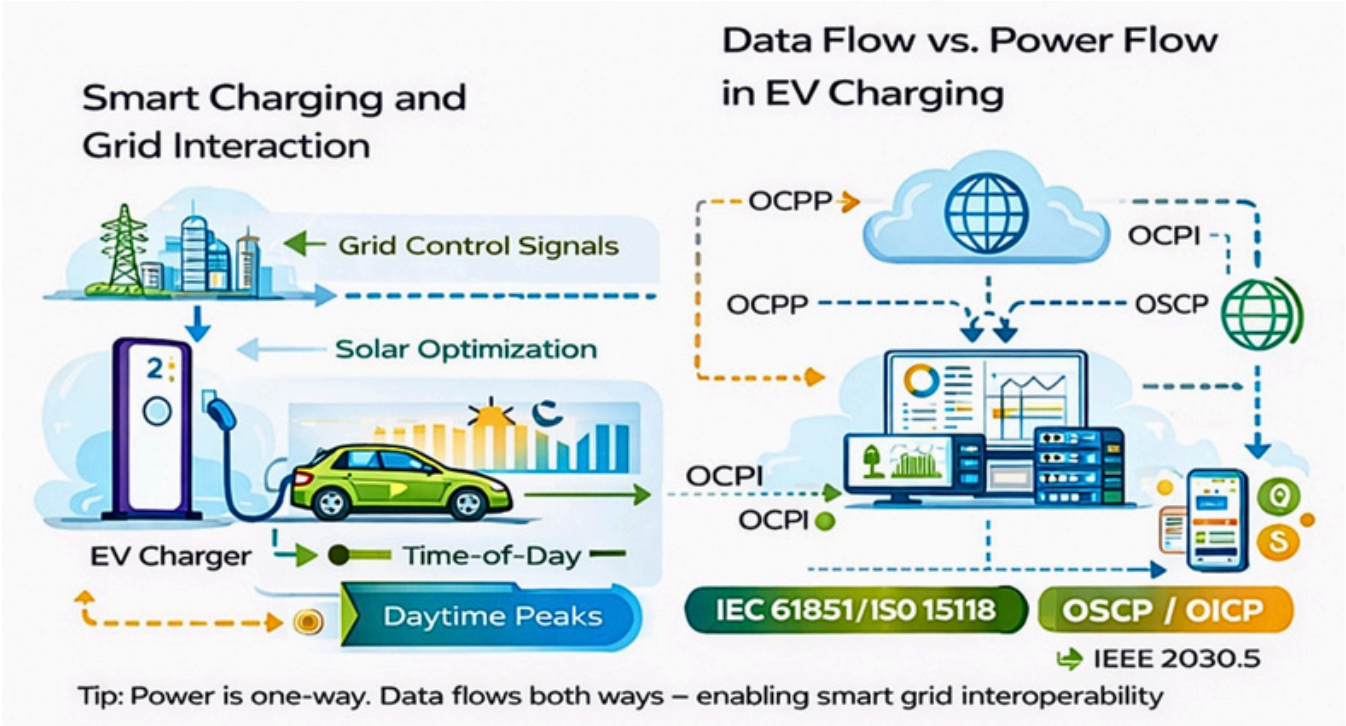
Future standards may incorporate blockchain-based identity management for fully distributed networks. Cybersecurity remains an evolving field with dynamic stakeholders and roles.

Grid Integration and Energy Intelligence

The primary benefit of smart charging is enhanced grid intelligence. Rather than treating each EV as a fixed load, modern systems can shift demand to off-peak hours, reduce local stress, and help utilities manage power more efficiently.

EV chargers have become integral components of smart grids:

- Load Forecasting: Predict how many chargers will be active across regions.
- Demand Response (DR): Reduce or defer charging during grid stress.
- Renewable coupling: Solar-powered stations adjust their output based on irradiance data.
- Digital twins: Simulate grid load behaviors and the impact of charging sessions.



- Examples - **Europe's IOWN project** and the **Netherlands**' **ElaadNL** research are developing city-wide charging grid simulation platforms.
- **Utilities in California** use AI to coordinate charging times based on renewable output forecasts.

Emerging Frontiers

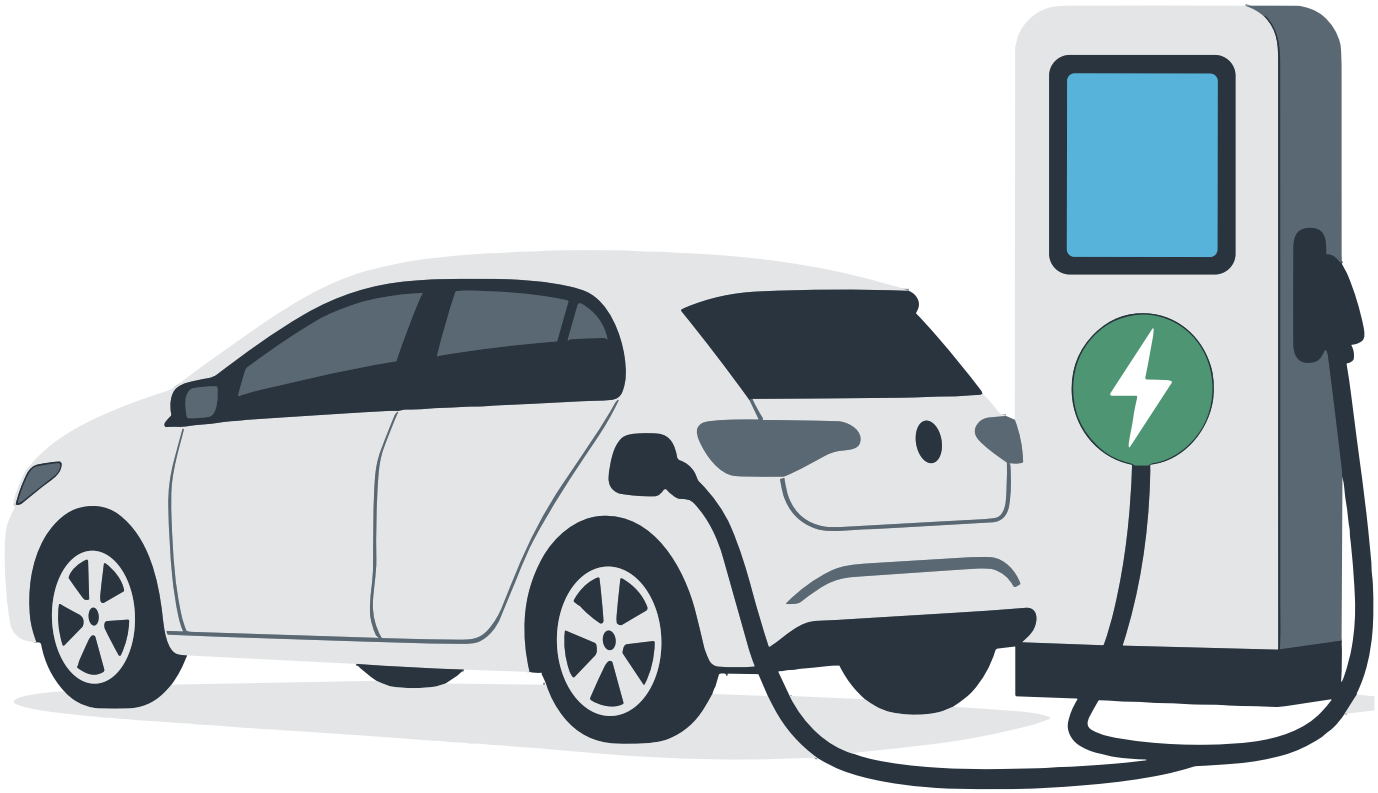
- **Edge Computing Gateways**: Handle local decisions with low latency (no cloud dependency).
- **5G Integration**: Enables fast, deterministic communication for V2G clusters.
- **Blockchain Payment Architectures**: Peer-to-peer (P2P) transactions without central operators.
- **Cloud APIs for Energy-as-a-Service (EaaS)**: Utilities provide open data for developers to build custom EV energy apps.

In Summary

The future of EV charging will not be defined solely by the number of chargers, but by how intelligently they communicate, adapt, and cooperate with the grid.

The champions will be the systems that **combine interoperability, cybersecurity, and energy awareness into a single platform**. In a market like India, the smartest charger will not just dispense power — it will help manage the future of the power system itself.

Next in the series: ***India's Electric Leap — A Tech-Powered Charging Ecosystem in Action.***



Peer-to-Peer (P2P) Energy Trading in India

A Comprehensive Explainer

India's peer-to-peer (P2P) energy trading landscape is entering a new phase, with live pilots under the India Energy Stack demonstrating how decentralized electricity markets could function at scale.

In this conversation with **Akhil JP, CEO & Co-Founder of Pulse Energy** Technologies Pvt Ltd, we explore the latest developments in India's P2P energy trading ecosystem, the role of digital public infrastructure, and how technology platforms are enabling consumers and prosumers to participate directly in energy markets.

What are the most recent developments in P2P energy trading in India?

India's P2P energy trading journey reached a landmark moment in February 2026. At the India AI Impact Summit held at Bharat Mandapam, New Delhi, REC Limited — the nodal agency for the India Energy Stack under the Ministry of Power — showcased the first-ever live demonstration of a peer-to-peer decentralized energy transaction under the India Energy Stack (IES) framework.

In a powerful illustration of technology meeting grassroots empowerment, **Arun Singh, a farmer from Meerut in Uttar Pradesh**, used Pulse Energy's WhatsApp-based AI voice agent to sell 6 units of surplus solar-generated electricity directly to **Lakshmi, a garment shop owner in Delhi,** earning ₹30. The transaction demonstrated a real-world application of the IES — a Digital Public Infrastructure designed to empower citizens as active "energy agents" rather than passive recipients of electricity.

This demonstration was presented to PM Narendra Modi on 16 Feb 2026 during his visit to the MeitY Pavilion, and subsequently to Union Power Minister Manohar Lal on 18 Feb 2026 at the REC Pavilion. The demonstration was conducted by Shashank Misra, Joint Secretary, MoP, and Prince Dhawan, Executive Director, REC Limited, alongside one of the first beneficiaries of the P2P pilot.

Key regulatory milestones in early 2026

- **DERC approval**: The Delhi Electricity Regulatory Commission approved intra-discom, intra-state, and inter-state (Delhi–UP) P2P trading for a six-month pilot. Transaction charges were set at ₹0.42/kWh shared equally between buyer and seller. Wheeling and open access charges within Delhi were waived. The 20% Capacity Utilization Factor cap on solar energy transactions was removed, allowing prosumers to sell as much solar energy as they generate.

- **UPERC approval:** The Uttar Pradesh Electricity Regulatory Commission approved the interstate P2P renewable energy trading pilot filed by PVVNL under the India Energy Stack framework. Blockchain-based settlement was approved, with a waiver of Cross Subsidy Surcharge during the pilot.

- **IES Version 0.3 released:** The Ministry of Power released Version 0.3 of the India Energy Stack Architecture and Strategy documents, formalizing digital identities for energy assets, consent-based data sharing, open APIs, and shared registries. The full IES project is scheduled for completion by July 2026.

What is the role of the India Energy Stack initiative?

The India Energy Stack (IES) is best understood as the “UPI for Electricity” — an interoperable digital framework of open standards and protocols designed to enable secure, low-cost data and service exchange across the entire power sector. **Just as UPI created a common rail that any bank or fintech could plug into for payments, the IES creates shared infrastructure for electricity markets** — enabling any authorized technology service provider to build applications and services on top.

Core building blocks (Version 0.3)

- **Digital identities for energy assets** — every meter, generator, and consumer gets a Verifiable Credential (VC), functioning like a DigiLocker for energy. This confirms a participant as a genuine DISCOM consumer and enables safe trading without exposing sensitive personal data.

- **Consent-based data sharing** — consumers and prosumers control who accesses their energy data, following principles similar to the Account Aggregator ecosystem.

- **Open APIs and shared registries** — allowing authorized Trade Platform Providers (such as Pulse Energy) to build P2P trading services, demand response programs, and EV charging integration on top of the stack.

- **Interoperable settlement** — blockchain-based transaction recording with settlement integrated into the DISCOM’s regular billing system, so consumers see P2P adjustments in their normal electricity bills.

Governance structure

REC Limited serves as the nodal agency under the Ministry of Power. FSR Global is the knowledge partner. India Smart Grid Forum (ISGF) provides technical inputs for scaling digital energy solutions. Networks for Humanity (NFH) contributes to the trust-based digital transaction framework. The IES Taskforce is chaired by Dr Ram Sewak Sharma, former Director General of UIDAI and former Chairman of TRAI — the architect behind India's Aadhaar and digital identity infrastructure.

The IES represents a fundamental structural shift: electricity reform is now being embedded in digital infrastructure rather than relying solely on tariff orders and regulatory amendments. It connects policy, technology, and market architecture in a unified framework.

What does the value chain of P2P energy trading look like?

The P2P energy trading ecosystem involves several interconnected stakeholders:

- **Prosumers (Supply Side):** Households, farmers, and businesses with rooftop solar installations who generate surplus electricity. Prosumers set their sell price within the regulatory framework and earn from energy that would otherwise go back to the grid at lower net-metering rates.

- **Consumers (Demand Side):** Individuals and businesses who want to buy green power directly from prosumers, often at rates lower than the retail grid tariff. Early pilots have shown buy prices up to **43% lower than retail tariffs**, creating a strong value proposition.

- **DISCOMs:** The physical backbone. Electricity continues to flow through the DISCOM's distribution network, and all transactions are verified by them. P2P trading works alongside the DISCOM, not in place of it. In the current pilot, BSES Rajdhani, Tata Power Delhi Distribution, and PVVNL are the three participating DISCOMs, together serving ~1.25 crore consumers.

- **State Electricity Regulatory Commissions (DERC, UPERC):** Provide the regulatory sandbox — setting transaction charges, waiving certain fees for the pilot, and framing commercial rules. After the six-month pilot, they will review results and set permanent regulations.

- **Trade Platform Providers (TPPs):** The technology layer authorized under the IES to build consumer-facing platforms. Pulse Energy is one of the authorized TPPs.

- **India Energy Stack / REC Limited:** Provides the overarching digital public infrastructure — trust framework, Verifiable Credentials, interoperability standards, and open APIs.

- **Smart Meters:** The hardware backbone recording real-time generation and consumption. DISCOMs verify this data, and the final settlement is based on verified meter readings.

The Transaction Flow for P2P Energy Trading

Prosumer generates surplus solar power → Registers on the trading platform using their DISCOM-verified Verifiable Credential → Lists surplus energy for sale (e.g., via Pulse Energy's WhatsApp AI agent) → A consumer agrees on price → Transaction is recorded on blockchain → Physical electricity flows through the DISCOM grid → Settlement is reflected as adjustments in both parties' regular DISCOM bills.

What is the current status of P2P energy trading in India?

P2P energy trading has moved from concept to live implementation as of early 2026. **Active pilots:**

- **Phase 1 (live):** The pilot covers the Delhi-NCR and western UP corridor with three DISCOMs: BSES Rajdhani and Tata Power Delhi Distribution in Delhi, and PVVNL in western Uttar Pradesh. It launched with approximately 1,000 consumers per service area.
- **Phase 2 (planned):** Expansion to include Dakshin Haryana Bijli Vitran Nigam and extend reach into Haryana.

Earlier pilots in Uttar Pradesh (implemented by ISGF and Powerledger) demonstrated feasibility and showed P2P buy prices ~43% lower than the retail tariff. BSES also ran a blockchain-based pilot in Dwarka, Delhi, in 2019, covering gated community solar consumers.

Measurable goals

- Proving that interstate P2P trading works across state boundaries within the IES framework.
- Demonstrating meaningful additional income for small prosumers, beyond net metering.
- Validating that AI-powered interfaces make energy trading accessible regardless of tech literacy.
- Testing IES's Verifiable Credentials, blockchain settlement, DISCOM-integrated billing at scale.
- DERC and UPERC will review pilot outcomes after 6 months to frame long-term P2P trading rules.

What is required to make P2P energy trading mainstream?

Scaling from pilot to mainstream requires progress on several interconnected fronts:

- National regulatory harmonization: Currently, each state regulator issues separate orders. The IES (targeted for completion in July 2026) aims to provide a unified national framework. However, interstate issues such as transmission charges fall under the CERC's jurisdiction. A cohesive approach spanning state and central bodies is essential.
- Smart meter deployment at scale: India's smart meter rollout is accelerating but far from universal. Without ubiquitous smart metering, P2P markets cannot expand beyond pilot zones.
- Expanding the rooftop solar base: P2P trading is only as valuable as the surplus energy available to trade. The PM Surya Ghar scheme (targeting 1 crore households by FY 2026–27) is critical, with over 20.85 lakh installations completed by December 2025. Gujarat, Maharashtra, and UP lead, but deployment remains uneven across states.
- DISCOM alignment: DISCOMs could perceive P2P trading as lost revenue. The current design — where **DISCOMs earn transaction and wheeling charges and retain network management** — makes them partners. But scaling requires this alignment to hold across dozens of DISCOMs with varying financial health and technical capability.
- Grid infrastructure upgrades: Distributed P2P transactions from numerous small prosumers could introduce grid complexities — voltage instability, reverse power flow, balancing challenges — especially in older distribution networks. Advanced load management and local energy storage will be needed.
- Mass adoption requires sustained user awareness campaigns, especially in rural areas where prosumer potential is highest.

- A nationally consistent framework for network usage charges is essential. **The pilot uses ₹1.01/kWh for interstate wheeling,** but this needs validation and standardization at scale.
- Platform interoperability: As multiple Trade Platform Providers operate under the IES, interoperability between platforms is critical — a prosumer on one platform should be able to sell to a consumer on another, just as UPI allows transfers between different banks.

How does Pulse Energy's platform facilitate P2P energy trading?

Pulse Energy is one of the authorized Trade Platform Providers (TPPs) selected under the India Energy Stack initiative. The platform's core differentiator is its focus on accessibility through AI-driven interfaces — making energy trading as simple as sending a WhatsApp message or downloading the SUPEREV mobile app.

- **For prosumers (supply):** The platform enables entities with rooftop solar to monetize surplus generation beyond net metering. The **WhatsApp AI agent** guides prosumers through registration, listing available energy, setting prices, and tracking earnings.
- **For consumers (demand):** Pulse Energy offers **SUPEREV, a mobile app** that lets consumers purchase green energy directly from prosumers. It provides an intuitive interface for browsing available energy, comparing prices, and completing purchases. For users who prefer not to download an app, the WhatsApp AI agent offers the same functionality — a consumer can simply ask for the best available rate, and the system presents options.
- Regardless of the interface used, **all transactions are reflected in the participant's regular DISCOM electricity bill,** so there's no new billing relationship to manage.
- The platform integrates with the IES trust framework. A prosumer's connection details, meter data, and solar capacity are **verified by the DISCOM.**

How does P2P trading tie up with Pulse Energy's EV charging network?

Pulse Energy operates one of India's largest EV charger management and interoperability platforms. The convergence of P2P energy trading and EV charging creates compounding value:

EV charging stations as flexible demand in P2P markets - In a P2P framework, CPOs can buy surplus solar energy from nearby prosumers at rates below grid tariffs. This is especially compelling during the daytime when solar generation peaks and many EVs are parked for workplace or destination charging.

Green energy certification for EV charging - Pulse Energy has been working with the Beckn Protocol team on the Unified Energy Interface (UEI). Through UEI, EV chargers on Pulse Energy's network can verifiably dispense green energy. P2P trading provides the provenance layer: when a CPO buys solar energy from a prosumer through the IES framework, that energy's renewable origin is blockchain-verified, enabling credible green charging claims.

Pulse Energy's existing capabilities — OCPP-based charger management, real-time energy transaction processing, payment settlement, ML-based demand optimization — **are directly transferable to P2P trading**. **EV owners** already using SUPEREV for charging can seamlessly access P2P green energy purchasing within the same platform experience.

Scaling India's Commercial EV Ecosystem through Financing

Vivek Jain, Stride Green Capital

*Founded in 2024, Gurugram-headquartered Stride Green Capital Private Limited provides structured **asset-leasing and financing solutions** in the cleantech sector. The Stride Green team carries investment experience in the climate sector during its engagement at Stride Ventures prior to founding Stride Green.*

Stride Green team leveraged this expertise to build a platform that provides capital, offers structured solutions, and provides technical underwriting. EVreporter spoke with **Co-founder and CEO Vivek Jain** to understand how Stride Green is addressing the capital and operational gaps in the commercial electric vehicle (EV) segment.

You raised INR 28 Crores in seed funding. How is this capital being utilised, and what is your current operational scale?

The seed round, supported by marquee investors such as **Micelio Fund, Incubate Fund, and Brisk Blue**, has been primarily allocated to **direct asset deployment.**

Currently, our assets under management exceed **5,000 units,** including a leased portfolio spread across all form factors, with a focus on large form factors such as **HDTs, buses, ZETs, and 4Ws (both passenger and Cargo).**

Could you elaborate on your business models? How do you balance direct leasing with your platform services?

We operate through three core pillars to ensure flexibility for different stakeholders:

- **Operating Lease Model: We provide EVs directly to fleet operators from our own balance sheet,** serving sectors such as large corporate logistics, employee transportation services, intercity movements, mobility aggregators, e-commerce, etc.

- **Platform Model:** We act as a platform, sourcing and structuring cleantech transactions for a diverse set of capital providers, including public and private-sector banks, NBFCs and global Leasing Companies.

- **SaaS Model:** This is our proprietary technology stack that captures over 1,000 data points across assets. It provides real-time tracking, uptime insights, and early warning signals, which enhance transparency, control and efficiency for all asset owners.

Residual value risk is a major concern in EV financing. How does Stride Green mitigate this?

We employ several layers of risk mitigation.

- **Real-time monitoring** of driving and charging behaviour via our tech platform is critical for controlling asset health.

- Financially, we use **innovative lease structures**, such as a **variable lease model** where rentals are flexible across years thereby aligning with income generation of the asset.

- Additionally, we secure **third-party buybacks** and **residual-value commitments** to protect against residual value fluctuations.

We are seeing increased interest in heavy electric commercial vehicles. What specific use cases are you currently supporting?

We are seeing faster electrification than anticipated in the ZET and HDT category, as the Total Cost of Ownership (TCO) becomes increasingly favourable. We recently deployed **55T trucks** for a leading cement manufacturer and are seeing high demand from industries like steel, ports, and mining. We have also deployed **1T** to **3.2T LCVs** across applications.

On the passenger 4W side, the **employee transportation** and **ride-hailing segments** are electrifying rapidly, and we are active across those fleet operations as well.

Charging infrastructure is seen as a high-risk investment. What's your strategy?

The majority of risks associated with charging infrastructure stem from the uptime and utilisation of the chargers. These risks can be mitigated by identifying strategic locations backed by visible demand. There are high-density movement areas with predictable charging demand heat maps, which can enable favourable cost economics. Our focus is towards supporting such strategic charging infrastructure.

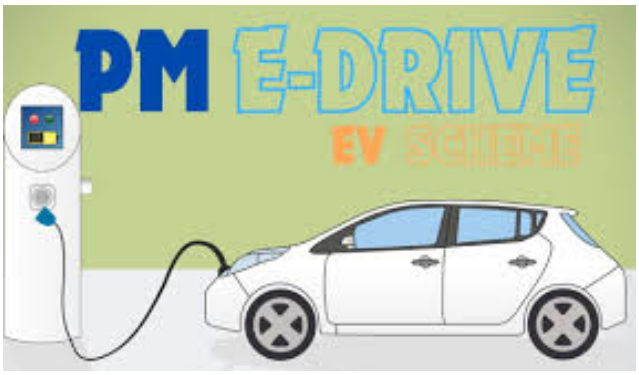
Looking ahead, what is Stride Green's long-term vision beyond electric vehicles?

While we have started with the EV ecosystem because of its current maturity, our mission is to scale sustainable business solutions across the broader **cleantech sector**. As the market evolves, we intend to **diversify into other asset classes** beyond vehicles and batteries, continuing to serve as a bridge between sustainable projects and institutional capital.

PM E-DRIVE Scheme duration has been extended for e-2Ws, e-rickshaws, and e-carts.

- **e-2Ws -** The terminal date for incentive eligibility is 31st July 2026. Incentive - INR 2,500/ kWh, max INR 5,000 per vehicle.

- **e-rickshaws & e-carts -** The terminal date would be 31st March 2028. Incentive - INR 2,500/ kWh, max INR 12,500 per vehicle.
- e-3W (L5) is already closed on 26-12-2025.



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Update on Localisation Norms for e-Trucks and e-Buses

MHI has issued amendments to the Phased Manufacturing Programme under the PM E-DRIVE Scheme for e-Trucks (N2/N3) and e-Buses (M2/M3), granting OEMs a 6-month extension to meet local manufacturing requirements.

- For both e-trucks and e-buses, **traction motors** must be manufactured domestically starting September 1, 2026. The previous deadline was March 1 for e-buses and March 3 for e-trucks.

- **Motor Controllers & Inverters** - By September 1, 2025, domestic integration of the assembled PCB, including high-voltage connectors, heat sinks, and software flashing, was required. By September 2026, the mandate will extend to the assembly of electronic components, semiconductors, and connectors directly on PCBs within the country.

Light Electric Vehicle Acceleration Forum (LEAF) Industry consortium launched to accelerate the growth of light electric mobility, enhance interoperability and expand EV charging infrastructure in India.

Founding organisations are **Hero MotoCorp, Ather Energy, and iPEC India.**

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Investment Commitments Secured

Companies	Round / Amount	Investors
Mufin Green Finance Limited NBFC	Equity INR 324 crore	MMG Family office, SageOne Investment Managers, Sandeep Kapadia, DS Group and more. Additionally, Promoter HINDON MERCANTILE LIMITED subscribed to warrants, convertible into equity shares.
Ecofy NBFC	Equity USD 42 M	British International Investment, Finnfund Digital Access Impact Fund, Eversource Capital, FMO
PMI Electro Mobility e-Bus OEM	Equity USD 310 M	KKR takes minority stake in e-bus OEM PMI Electro Mobility and a majority stake in ALLFLEET (PMI Electro's e-bus fleet operator platform)
Euler Motors Commercial EV OEM	Series E INR 437.5 Crore	Lightrock, Hero MotoCorp and Blume Ventures. The round also had an **additional INR 250 crores of debt funding** from BlackSoil, Trifecta Capital, InnoVen and Alteria Capital. Total capital raised to date stands at INR 1900 crore.
Bacancy Systems Electronics and power systems	Series A INR 40 Crore	Sabre Partners, Greenstone Capital and more
GFCL-EV Battery Materials	Equity USD 80 M	Investment by a global investor. This is in addition to USD 50 million already raised from IFC, bringing the total capital raised to USD 130 million.
Raptee Energy E-motorcycle OEM	Equity INR 25 crores	TIDCO (Tamilnadu Industrial Development Corporation Limited)

ZELIO FUTURE IS ELECTRIC

Motilal Oswal Financial Services has acquired 3.5 lakh shares of Zelio E-Bikes, a **1.65 per cent stake, for ₹9.8 crore.** BSE-listed Zelio reported revenue of ₹134.78 crore and PAT of ₹11.87 crore for H1 FY26. For FY25, Zelio E-Mobility reported revenue of ₹172 crore and profit after tax of ₹16 crore.

Africa-based E-2W maker Zeno has raised **$25M through a mix of Series A equity and debt financing**. The company had previously raised $9.5 million in seed funding. Zeno operates in four cities across East Africa. Along with its Emara electric motorcycle and battery systems, it develops multi-modal charging solutions for 2Ws and 3Ws.

Electric Vehicle Launches

TVS Motor Company has launched the Orbiter V1 electric scooter with a 1.8 kWh battery and introduced a Battery-as-a-Service (BaaS) model across its electric scooter portfolio.

- Priced at ₹49,999 (ex-showroom Delhi) with BaaS, ₹84,500 without battery subscription.
- IDC range of 86 km, 0–80% charging in 2h 20 minutes.
- The Orbiter lineup now includes V1 (1.8 kWh) and V2 (3.1 kWh) variants.

Ultraviolette Automotive launches a battery subscription program, 'Battery Flex' (BaaS) for its motorcycle X-47 Crossover, in partnership with **Ecofy**. The initiative allows customers to own an X-47 starting at ₹1,49,000, while battery subscription charges begin at ₹2499 per month. The vehicle is otherwise offered at ₹2.5 lakh (without the BaaS option).

Also, Ultraviolette signed an MoU with the Government of **Karnataka** to expand its manufacturing operations in the state, which has proposed PLI incentives and facilitation support. The company's five-year **phased investment plan includes an investment of INR 200 crore** to expand its existing facility and a new plant with an annual capacity of 150,000 units

CollarEV introduces 'Moon', an e-2W for B2B delivery and logistics - to be priced between ₹79,999 and ₹89,999.

- 2.3 kWh lithium iron phosphate (LFP) battery pack
- Claimed range of 135 km per charge
- BLDC hub motor | 0–80% charging in around 2 hours
- Payload capacity of up to 150 kg and top speed of 50 km/h

Bengaluru-headquartered Apeiron Mobility launches X3c electric cargo vehicle for last-mile deliveries. at a launch price is INR 99,999 (ex-showroom, Karnataka) for a limited period. The ICAT-approved vehicle offers a range of 120 km and a 3-year warranty for the motor, controller and battery pack.

Electric Vehicle Launches

VinFast India opens booking for the VF MPV 7, a seven-seater electric MPV. Price will be revealed on April 15, 2026.

- 60.13 kWh battery | Range: 500+ km
- 10 % to 70% fast charging in ~30 minutes
- Dimensions: 4,740 x 1,872 x 1,734 mm

VinFast India also recently inaugurated its 50th retail outlet in India, located in Bengaluru, with the aim of establishing 75 dealerships across more than 60 cities by the end of the year.

Kia India Expands Carens Clavis EV Line-up with New GT-Line & X-Line trims and 6-seater configuration.

GT-Line and X-Line trims were introduced for the Extended Range variant.

Powered by 99kW & 126kW motor delivering 255 Nm torque, the EV offers dual battery options—51.4 kWh (490 km range) and 42 kWh (404 km range)—and fast charging from 10% to 80% in 39 minutes.

Honda Cars India starts pan-India test run for its first Electric SUV. The prototype of this model, known globally as **Honda 0 α**, was unveiled at the Japan Mobility Show 2025. The model is planned for global introduction in FY 2026–27, with India and Japan among the key markets. EV Manufacturing will take place in India.

Switch Mobility showcased its electric sanitation solutions at Municipalika 2026 in New Delhi, including the IeV3 garbage tipper and IeV4 electric road sweeper.

- **SWITCH IeV3 Garbage Tipper** is offered in 2.5, 3, and 3.5 CuM configurations, payload capacity of up to 900 kg with the tipper, and up to 1250 kg (FSD). 25.6 kWh battery, PMSM motor, up to 140 km range, 300V architecture.
- The **electric road sweeper** comes with a 6-inch vacuum suction system with vacuum-operated brushes, 2.0 cubic metre waste tank and 500-litre water storage capacity.

SUN Mobility has received AIS 038 certification for its **swappable high-voltage battery platform for truck and bus applications from ARAI.**

- The platform is available in two variants — 50 kWh and 100 kWh, and combinations thereof, both operating in the 660V category.
- OEM-agnostic design supports both new vehicle integration and retrofit applications.

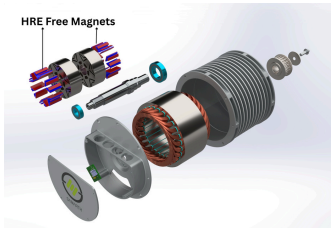
Hero MotoCorp receives type approval certificate for its category-swapping EV (2W/3W), the **Surge 32.** This is the first vehicle to be approved under India's **new L2-5 category.**

KETO MOTORS has secured CMVR Type Approval Certification for its **9-metre Urbanova KE9 electric bus** from Global Automotive Research Centre (GARC). The company has a **technology partnership with Tron Energy** Technology Corporation, Taiwan's largest E-bus OEM.

The 9m e-bus offers a range of up to 225 km and is powered by a 245 kW motor delivering 3000 Nm of torque. It accommodates 31 seated passengers and 11 standing passengers, and uses a liquid-cooled PMSM motor, delivering a cruise range of 188 km (IDC).

Future AutoTech Global Ventures has received CMVR certification for its **12-meter Electric Seater-Sleeper Bus** from Global Automotive Research Centre (GARC) in compliance with AIS 052, AIS 119, and AIS 153.

Their manufacturing plant is located in Bhopal, Madhya Pradesh.



Ahmedabad-based Samarth E-Mobility unveils its full-stack EV technology platform that integrates key EV components, including battery pack, BMS, motor and power electronics. The company plans to introduce its **first electric motorcycle this year.** which will be powered by this platform. The battery pack has been homologated by NATRAX - National Automotive Test Tracks, and its BMS has been validated by ICAT.

EKA Mobility, in consortium with **GreenCell Mobility, has secured a Letter of Award** for the supply and deployment of **915 electric buses in Hyderabad** under the PM E-DRIVE scheme. The order includes 100 9-meter and 815 12-meter non-AC electric buses, to be deployed for urban transport operations. The project is part of CESL-led initiatives to expand electric public transport across Indian cities.

ThunderPlus has partnered with **EveyTrans Private Limited to develop a 1.6 MW EV charging hub near Vijayawada** along the Hyderabad–Vijayawada corridor. The facility will include 7 DC chargers, battery swapping infrastructure, and fast chargers for electric two-wheelers. It is designed to support electric buses, commercial EV fleets, passenger EVs, and two-wheelers. ThunderPlus reported revenue of **~₹15 crore** for FY 2025-26

Mahindra Charge_iN, in partnership with Hindustan Petroleum Corporation Limited **(HPCL),** will set up EV Charging Stations at HPCL fuel stations across India. These stations will feature 180 kW dual gun chargers for e-4Ws. HPCL operates over 24,400 retail outlets nationwide and runs over 5,400 EV charging stations under the HP e-Charge brand.

Ather riders can now discover LECCS-enabled Bolt.Earth Blaze DC fast chargers on the Ather app and scooter dashboard. Riders can also book and charge using the Bolt.Earth app. Over 195 Blaze DC 3 kW chargers with Type 7 (LECCS) connectors are available across 100+ cities, including Bengaluru, Mysuru, Chennai, Hyderabad, Visakhapatnam, Kochi, and Kozhikode.

Jio-bp pulse and **Signo have announced a partnership** to expand EV charging infrastructure for commercial electric vehicles in India. The collaboration will focus on developing charging access at key fleet hubs to support the adoption of electric commercial vehicles, including electric four-wheelers and electric heavy commercial vehicles (eHCVs).

Servotech Renewable Power System Limited and **ElectraEV** have received a joint patent from the Indian Patent Office for an EV charging device for low-voltage EV platforms. The technology enables **DC fast charging of sub-200V electric vehicles**—including those based on the GB/T Bharat DC 001 standard—using conventional high-voltage CCS2 charging infrastructure.

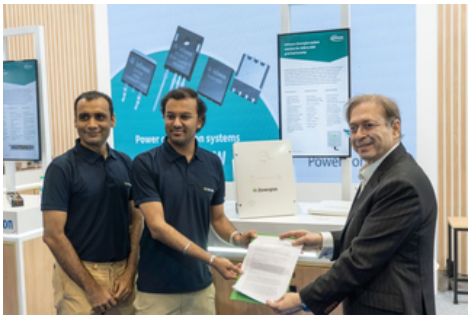
Bijliride has partnered with **Indofast Energy** (a JV between Indian Oil Corp Limited and SUN Mobility) to support the expansion of its **B2C EV rental services through battery-swapping infrastructure.** The rollout will begin in Hyderabad, followed by planned expansion to Bengaluru, Pune, and Chennai over the next 12–18 months. Bijliride plans to deploy several hundred electric two-wheelers in the initial phase.

Octillion Power Systems' India division has manufactured its 100,000th EV battery system unit. This unit was manufactured at the company's Pune Two facility for an electric passenger SUV of an Indian automotive manufacturer. Octillion began operations in India in 2017, initially producing battery systems for electric buses.

Ashok Leyland breaks ground for its battery-pack manufacturing facility at Pillaipakkam, near Chennai, Tamil Nadu. The project involves an investment of ₹400-500 crore and is part of the investments planned by the Hinduja Group Limited under an MoU signed with the Government of Tamil Nadu in September 2025.

Valeo opens a new electric powertrain production line at its Pune plant (in Lonikand) to manufacture 3-in-1 e-axle systems integrating motor, inverter and reducer**.** Valeo has been selected by **Mahindra** to provide the electric powertrain of its Born Electric platform, and these e-axles will equip the new models

Spark Minda and **Turntide Technologies** have formed a joint venture to develop and manufacture high- and low-voltage motor controllers, high-voltage electric motors, pumps for thermal applications, and customised controllers for India's EV segment**.** Minda Corp, through its wholly owned SPV, will hold a 49% stake, and Turntide will hold a 51% stake.



Zenergize has partnered with **Infineon Technologies to integrate silicon carbide (SiC) power semiconductor components into its power-electronics products for solar and distributed energy applications.**

Infineon will supply components and provide technical support for system-level optimisation and product development.

JSW Motors Limited partners with **Dassault Systèmes for the entire range of its upcoming New Energy Vehicles.** Established in 2024, JSW Motors Limited is the electric car arm of the JSW Group, with an upcoming manufacturing facility in Chhatrapati Sambhaji Nagar, Maharashtra. The 3DEXPERIENCE platform will empower JSW Motors to manage the complexity of software-defined vehicles. It will also enable integration across JSW Motors' value chain, from design and engineering to manufacturing and lifecycle management.

Exicom inaugurated its new integrated manufacturing in Hyderabad to scale the production of EV Chargers (AC and DC), lithium-ion battery packs, and critical power solutions for telecom and data centres.

Developed with an investment of **INR 216 crore,** the facility increases the company's overall production capacity by 2.5 times in its first phase.

Tsuyo has received Single Window Clearance from the Government of Karnataka to set up an EV powertrain manufacturing and validation facility in Hubli-Dharwad.

The project involves an **investment of ₹250 crore** and will be developed on a 20-acre site. The company had signed a Letter of Intent with the state government in November 2025 during the Bengaluru Tech Summit.

Cargo Matters, a New Delhi-based logistics company, has announced a **₹66 crore investment to deploy over 550 EV charging stations across South India in partnership with TRYK CHARGE SERVICES**. The network will include 360 kW DC fast chargers supporting CCS2, CHAdeMO, and AC charging, and will be installed across Andhra Pradesh, Telangana, Karnataka, Tamil Nadu, and Kerala.

iGowise Mobility has signed an MoU with **DAIOTS ARC to deploy 1,000 BeiGo electric Trikes for hyperlocal logistics.** iGO Wise Mobility will supply an initial fleet of 100 BeiGo X4 electric trikes, with plans to scale the deployment to 1,000 vehicles across urban and semi-urban corridors.

NavPrakriti has partnered with **NASH ENERGY (I) PVT LTD.** NavPrakriti will manage the recycling of batteries produced by NASH Energy, including production scrap, in line with India's Extended Producer Responsibility (EPR) regulations.

Kinetic Engineering LLC announced that its promoter group has infused an additional ₹40 crore into the company through the conversion of warrants. Promoter shareholding has now increased to 65% from 49% four years ago. The funds will support expansion in EV and automotive component businesses, including distribution expansion for the Kinetic DX electric scooter.

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