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INDIAN AUTOMOBILE INDUSTRY

Electric vehicle sales without batteries face multiple challenges, despite Government push

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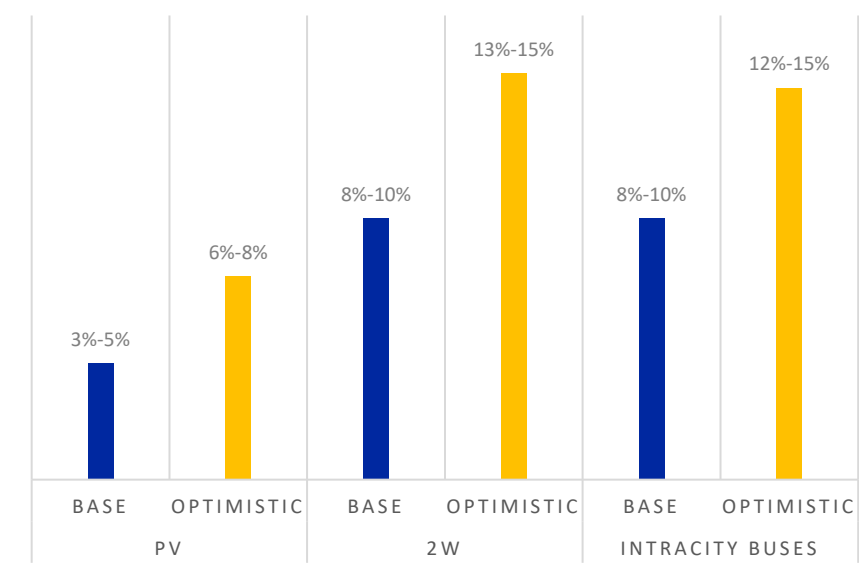
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EV penetration to remain low in the medium term

Exhibit 1: Expected EV sales in new vehicles sales by CY2025



Source: ICRA research; base case scenario is most likely scenario

Earlier, we had expected a hybrid vehicle to gain strong traction in the domestic market, thanks to lower taxes and additional FAME subsidy. However, with a revised taxation structure under GST, where EV attracts 5% duty as compared to 43% for hybrid counterparts, along with substantial reduction in subsidy under FAME II for hybrids - hybrid vehicle has lost their attractiveness.

Government allowed registration of EVs without batteries

In the letter dated August 12, 2020 to all transport secretaries – the Ministry of Road Transport & Highways (MoRTH) has allowed the registration of EVs without battery. The idea was to address one of the key barriers for EV adoption i.e. high upfront cost by segregating battery cost (which accounts for about 40% of vehicle cost) thereby lowering the price of the EVs below ICE counterparts by adopting the battery-sharing/ swapping model. Battery swapping also solves the problem of range anxiety, if there are adequate battery-swapping stations in a region. Battery swapping is primarily targeted at the commercial segment, especially in the three-wheelers, small commercial vehicles and delivery bikes (2w). This directive has paved the way for the adoption of the battery-swapping model, where batteries can be provided on rent/lease and can be swapped at authorised outlets.

While the intent is appreciable, the battery-swapping model has inherent challenges regarding the standardisation of battery specifications, technology-sharing between the OEMs, financing availability, the subsidy-sharing mechanism and the tax structure.

The Indian market is price sensitive and 'economies of scale' is crucial for an automotive OEM to price its model competitively. At present, the prices of electric vehicles (EVs) remain significantly higher than their ICE counterparts. This, along with a limited range and lack of public charging infrastructure, resulted in minimal EV penetration in the country. Government support in the form of direct/indirect financial incentive and supportive regulation will be crucial for EVs to gain traction in the Indian market. ICRA expects the automotive sub-segments like the three-wheelers (3W), two-wheelers (2W, especially scooters), intracity buses and small commercial vehicles (SCVs) to emerge as early adopters due to the comparable total cost of ownership with their ICE counterparts. However, EV penetration is likely to remain low in the passenger vehicle (PV) and heavy trucks segment. Over the next five years, EVs will account for 8-10% of the new vehicle sales in 2W and intracity buses, whereas its share will remain about 3-5% in the PV segment. However, the 3W segment may witness rapid transition with sizable EV penetration (in new vehicle sales) by 2025.

OEMs' dilemma regarding technology-sharing and erosion in pricing flexibility will resist investment in battery-swapping models

Exhibit 2: Comparison of EVs with Battery Swapping vs Battery Charging Mechanism

	Battery Charging	Battery Swapping
Upfront cost	High	Moderate, if battery available on lease High, if battery also bought upfront
Range anxiety concerns	High	Moderate to low (in case of adequate swapping stations)
Charging mechanism	Plug in Charger	Plug in Charger or Battery Swap
Charging time	Fast Charger: <2 hours Slow Charger: ~8 hours	<15 minutes
OEMs control over technology	High	Moderate
Battery supplier control over technology	Moderate	High
Primarily target segment	Personal	Commercial
Models in Indian market	PV: Tata Nexon, Hyundai Kona 2W: Ather 450X 3W: Mahindra Treo 3W SCV: eSupro	2W: Revolt RV300/RV400 3W: Piaggio Ape E-City

Source: ICRA research

Battery as a service (BAAS) will challenge pricing flexibility as well as technology edge of the OEMs

Economies of scale is a key determinant to price a product competitively, and in the context of battery swapping, it can only be achieved by collaboration between the OEMs for standardising battery specifications. Standardisation of battery specifications for swapping is akin to the standardisation of EV charger specifications. Unless there is standardisation of battery specification across the OEMs, a meaningful success in the battery-swapping adoption is unlikely. For example, in Japan, four prominent two-wheeler OEMs have collaborated to develop standard swappable battery platforms for two-wheelers.

ICRA believes that battery design along with battery management system (BMS) is a core technology of any OEM/platform and hence it may be difficult for the OEMs to share them with competitors, which may limit the success of battery-swapping in India. Moreover, in the battery-swapping model, a sizeable share of the overall value addition (due to battery) will be outside the scope of the OEMs, which will impact their pricing flexibility and hence profitability in the long run. Given the importance of battery hardware and software in overall performance of an EV, battery swapping will face strong resistance in technologically complex products like cars or performance two-wheelers. Gogoro, a Taiwan-based 2W OEM and one of the most successful battery-swapping solution provider also has proprietary battery specification, which can't be directly used in competitor models. ICRA believes that due to the relatively less complexity of vehicle design, battery swapping may gain acceptance in the 3W segment but its success in other automotive segments is doubtful.

Financing is another roadblock for entire EV industry

Premium pricing and poor residual value of EVs is a key deterrent for financiers; steady declining EV battery prices also pose a challenge for battery leasing companies

Globally, battery swapping or battery leasing has seen limited interest; India likely to follow a similar pattern, especially in cars and 2W segment

Financiers remain cautious towards EV financing

Financing is one of the key driver of automobile sales, and residual value of a vehicle after 3-4 years is a key driver of financing penetration. The EVs are generally priced at a premium, and their resale value takes considerable hit after getting out of the showroom as compared to ICE counterparts. The concerns on resale value can only be addressed, when there is a large population of such vehicles in the market, which will take some time. The modality of vehicle financing in a battery-swappable model, where core battery is owned/leased by the third party and financiers only have control over residual vehicle is another challenge for the industry.

In France, Renault had earlier worked on a business model wherein their EV model 'Zoe' can be sold without a battery whereas battery was given on a monthly lease. However, Renault also subsequently shifted to outright sales of vehicles by ditching the monthly-leasing model. Even Chinese OEMs like Xpeng and Nio have started offering a battery on lease, but success of that remains to be seen. In India, ICE vehicle financing is currently available at sub 9% and getting similar fine rates for EV counterpart remains a challenge in the medium term. Given the liquidity crunch and risk aversion in the NBFC sector, ICRA believes that retail funding will become another big roadblock for battery swapping to gain any meaningful traction in the non-commercial segment of the Indian market.

To incentivise EV customers, the Government has allowed an additional income tax deduction of up to Rs 1.5 lakh under Section 80EEB on interest taken on the electric vehicle loan. The State Bank of India, leading car financier in India, is providing additional 20bps benefit on prevailing car loan. However, the overall consumer as well as the financiers' interest in EVs has remained low.

With respect to the battery-swapping mechanism, there are other concerns like the mechanism of subsidy-sharing and inverted duty structure, when battery is sold separately. At present there is no clarity regarding the bifurcation of the FAME II subsidy between a vehicle manufacturer and a battery provider. Also, the GST of the EV vehicle is 5% compared to 18% for the EV battery and this could result in a cost escalation. Moreover, in case of a fire mishap due to short-circuit in battery, product liability and insurance could become another area of conflict. ICRA believes that while some of these issues can be resolved through Government clarification, financing and battery standardisation are big roadblocks for the industry, which should be addressed adequately for battery swapping to gain any meaningful traction in the medium term.

Key Takeaway

The Indian market is unlikely to witness any meaningful penetration of EVs in the key automotive segment likes the PVs and the CVs, unless the prices of EV reduce drastically or there is a strong direct and indirect financial stimulus from the Government to incentivise EV adoption. Demand incentive for electric PVs is restricted to the commercial taxi segment, highlighting that the GoI is aware that attractiveness of EVs for personal car buyers will remain distant in the near to medium term. Moreover, substantial investments are required in the EV vendor ecosystem to keep costs under check and reduce dependence on imported electronic systems.

Within the EV ecosystem, battery swapping will face significant resistance from automobile OEMs due to a possible impact on their product differentiation capabilities as well as pricing flexibility; hence, its acceptance will be limited to certain less complex automotive sub-segments like the 3W. Given the importance of battery hardware and software in the overall performance of an EV, battery swapping will face strong resistance in technologically complex products like cars or two-wheelers.



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