

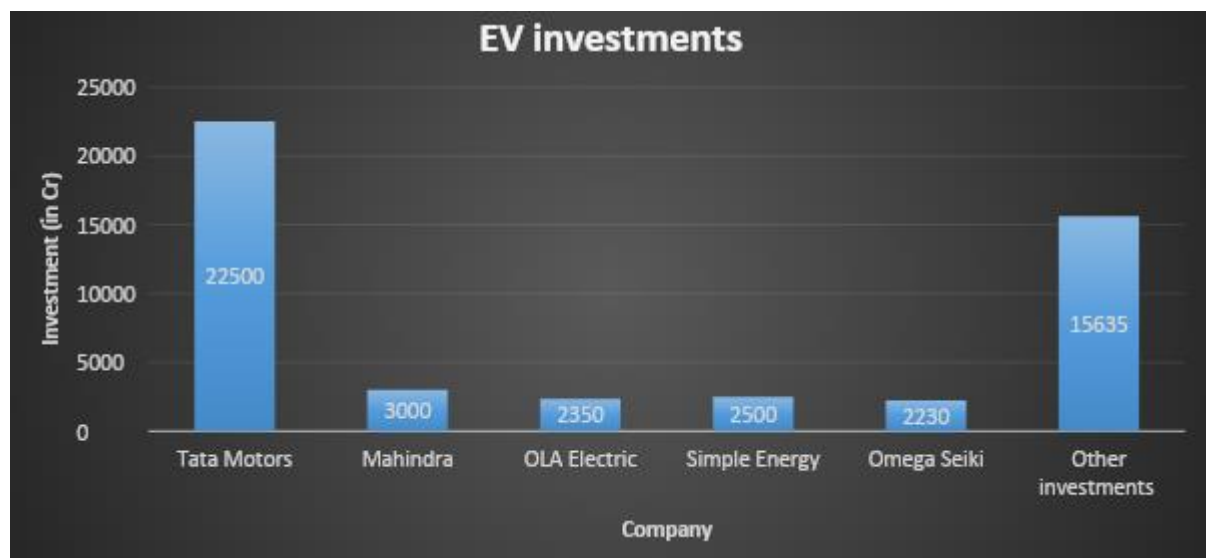
## EV Explosions: An initial hiccup in the transition to green vehicles

*Electric vehicles (EVs) are vital in India's quest to achieve net-zero emissions by 2070. However, they have garnered national attention for all the wrong reasons recently.*

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A spate of EV explosions in India has raised safety concerns about the technology. However, it is too early to write off EVs on the evidence of these incidents. Only detailed investigations and analyses will reveal whether the battery explosions in Hyderabad and other parts of the country occurred due to extreme weather conditions, battery mismanagement, or other reasons.

These incidents have led to widespread criticism that automotive companies are rushing the manufacturing of EVs to capture a massive share of the growing market, thereby compromising human safety. But if we look at the investments made by leading EV manufacturing companies in India (see the figure below), it is evident that they have been made considering the bright future of EVs in the country. Given the heavy capital investment, these companies are unlikely to make profits in the near future.



*Note: The information is taken from 'Banking on Electric Vehicles in India', a NITI Aayog and RMI report published in 2022.*

Moreover, human loss and accidents damage the trust that consumers have in companies, affecting their credibility in the long term. According to the Ministry of Road Transport and Highways (MoRTH), the percentage of EV explosions out of the total EVs running on Indian roads is minimal (not even 0.1%). Considering the overall benefit of EVs in the transition towards electromobility, these incidents should be seen as anomalies and not the trend.

An EV battery is a complex device, and research is still on to improve battery safety parameters, especially in tropical countries such as India. Tropical countries face high average ambient temperatures, relative humidity, and radiations, and the NITI Aayog recommends that battery manufacturers should consider these aspects while designing batteries. Currently, automotive companies mainly use lithium-ion batteries for EVs. In the future, variants such as solid-state and lithium-sulphur batteries could monopolise the market as they become better and safer. Global EV manufacturing companies such as Tesla, Tata, and [Ford](#) have dedicated research teams working on improving battery performance. It is a matter of time before further breakthroughs are achieved in EV battery technology, performance, and safety.

We have seen mobile battery blasts in the past, with critics up in arms even then. But the end-result is in front of everyone. There is no question that EV manufacturing companies need to investigate and rectify the faults that have led to the current crisis — whether it is poor thermal management, the use of B-grade cells, or internal resistance mismatching in battery packs. Features such as auto power cut-off in battery charging would go a long way in eliminating issues arising from overcharging. EV makers should also educate consumers on the dos and don'ts while using the vehicles. For instance, consumers should be made aware that parking EVs in extremely hot weather (especially while charging and in a highly charged state) could cause batteries to explode because of thermal run away.

The positives of using EVs far outweigh the negatives. In the long run, the EV sector will create one of the biggest job markets in India and could provide a feasible solution to global warming. In India, the number of vehicles in private, commercial, and public use is increasing at an alarming rate every year. EVs are the primary substitute for fossil fuel-based mobility in the country.

Indigenous battery technologies suitable for Indian conditions could be adopted and deployed — with the help of academic and industrial collaborations — to catalyse the development of better and safer batteries in the country. Industries could consider setting up R&D wings for new technology development and custom modification of imported technologies to make them suitable for Indian conditions. Modifications may include changes in design, battery management system, and cooling. Just assembling battery packs using imported technologies will not be useful for India in the long run.

Although leading IITs have a few centres of excellence that focus on battery and EV research, there is an urgent need to set up a dedicated research institute for EVs (including batteries) to address future challenges. The government could consider making battery testing mandatory through existing facilities available at the Central Power Research Institute, Bengaluru, or by setting up an autonomous testing centre dedicated to EV batteries. Testing organisations could certify batteries before they are installed in EVs. The government could also consider starting a separate EV wing under the National Rail and Transport Institute (NRTI), targeting the research and certification of batteries.

Rather than becoming vocal critics, we need to give the EV manufacturing sector and the government ample time to settle the teething issues scientifically.