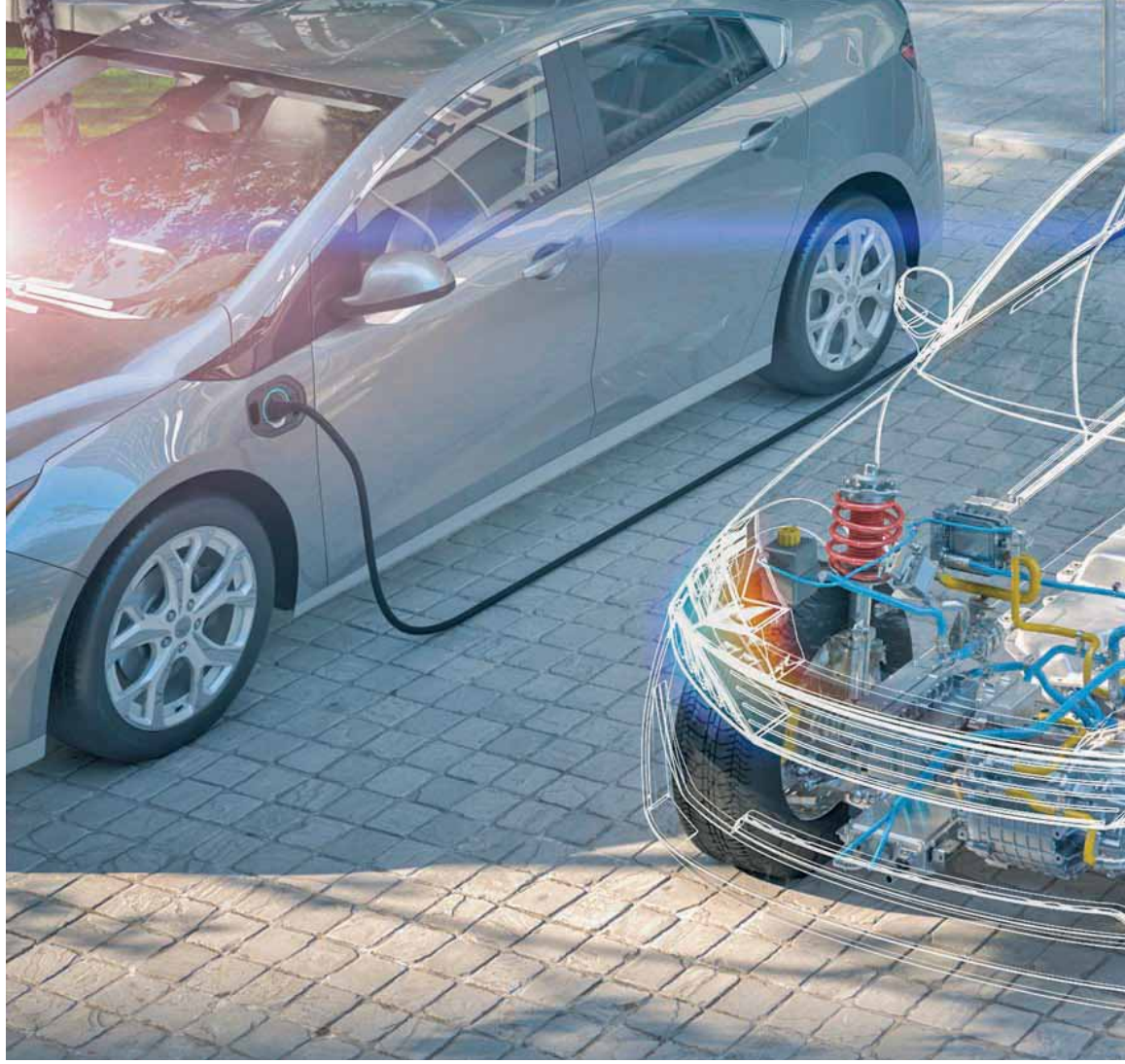
With the unprecedented rise in demand for doorstep deliveries and the growth of e-commerce, electric vehicles will be the choice for last-mile delivery and the future of India's transportation ecosystem. CARGOTALK explores the eminent rise of the electric vehicles industry.



Future is electric, take charge!

Priyanshi Bana

Still at a nascent stage, electric vehicles (EVs) are already creating ripples in the automotive market in India. As the Indian automobile industry aims to be among the world's top three in automobile manufacturing by 2026, e-mobility presents just the right opportunity to do so. Aligned with growing environmental concerns, the highest ever capex of INR 1.08 lakh cr for the Ministry of Roads in the Union Budget 2021, focus on energy security and reduction of import bills, a holistic move towards EVs is a big step in the right direction. Further, as part of the initiative to improve the air quality, modern cities are encouraging fleets of vehicles to adopt alternative technologies, such as EVs.

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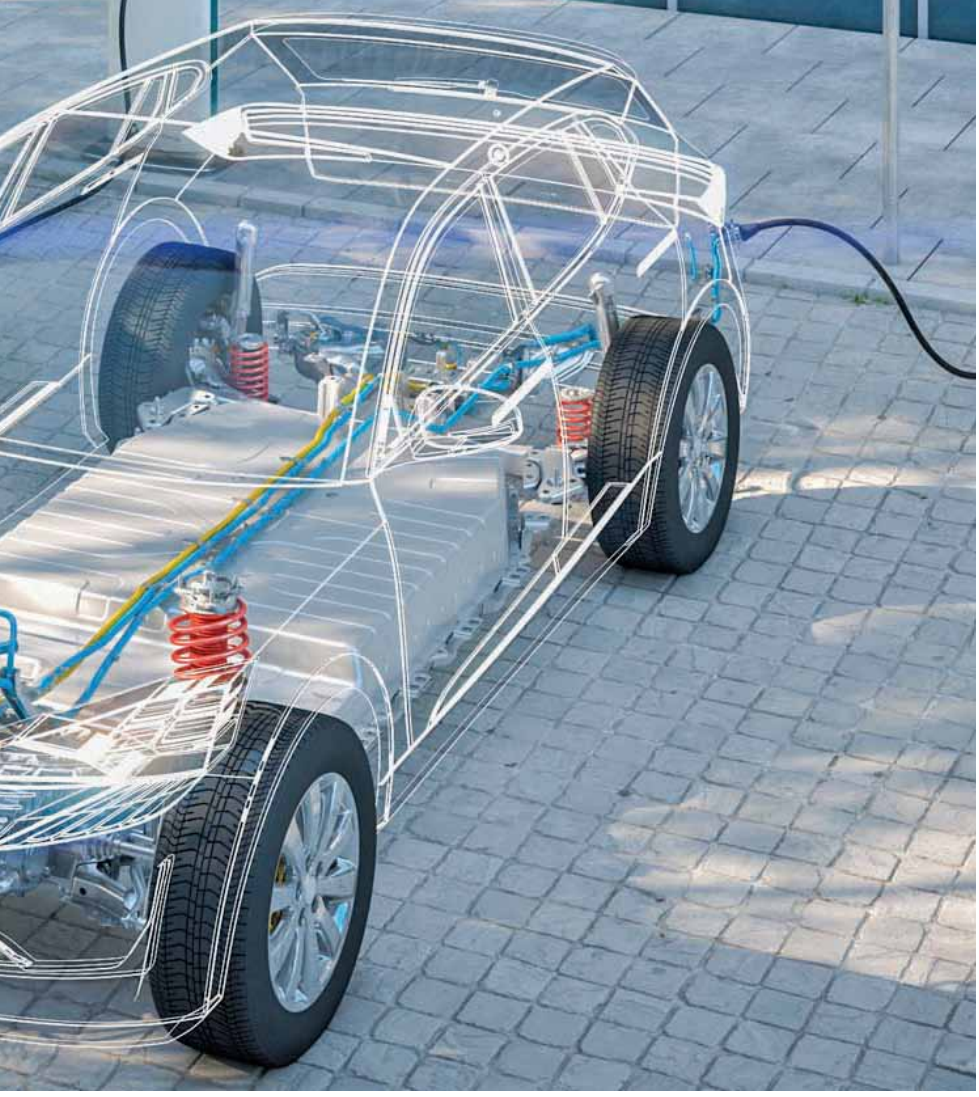
Several factors promoting the use of these technologies include: (i) companies receive incentives to reduce their carbon footprint; (ii) high variability of oil-based products and long-term cost risk associated with dependence on oil-based energy sources; (iii) availability of government subsidies to reduce acquisition cost; and (iv) advances in alternative energy technologies (such as EVs), which have potential for more environmentally sustainable solutions at a cost that is starting to be competitive. From both an environmental and energy standpoint, the use of EVs should be a first priority for the reduction of primary energy consumption. In the case of last-mile



logistics and doorstep deliveries EVs have played a key role during the pandemic.

Pushkar Singh, CEO & Co-Founder, LetsTransport, says, "Last-mile will play a major role in pushing wider EV adoption in logistics. Last-mile deliveries majorly require small assets classes – bikes, 3-wheelers and 4-wheelers who have loading capacities up to 1 tonne. All of the innovation in EV space is currently happening in these asset classes as it will take time to develop technologies to operate large electric trucks. Further, the operating cost efficiency that EVs offer is close to 30 per cent compared to normal ICE trucks, and this gulf is increasing with rising fuel costs. For the sustainable model that the sector is moving towards, EV will definitely play an extremely crucial role." For consumers, EVs enable them to optimise their deliveries, and allow them to operate for more trips, lesser maintenance, and service support. Further, given the continuous surge in consumer fuel prices, EVs can easily help reduce vehicle running costs as compared to ICE vehicles.

With reduced carbon footprints, EVs become an even more attractive proposition. Moreover, EVs are far less complex vehicle structures and can easily help customers reduce hidden costs by modern technologies and software for fleet tracking, battery health and optimisation and telematics as they are easier to integrate with sensors.

Pushkar Singh
CEO & Co-Founder
LetsTransport

When we use smarter technologies, it will eventually curb inefficiencies with respect to route optimisation and entire fleet operations.

Given the huge savings on fuel intake and asset utilisation costs, EVs can also play a major role towards low cost last-mile delivery in the coming days. This will lead to easing of retail prices of several items as logistics is a key component in the cost mix. **Prasad Sreeram**, CEO and Co-Founder, COGOS, says, "EV rise is inevitable. The new technology that it offers is pushing the EV adoption throughout the country, specifically in the last-mile space. Sustainability for environment and arresting raising fuel costs adds to the list as well. As next generation vehicle technology, EVs suit perfectly to the interest of better ride quality, zero noise and air pollution, sustainable growth, stop & start traffic condition of the city and lower the cost of ownership."

Further explaining the rise in demand of electric vehicles, **Dr Amitabh Saran**, Founder and CEO, Altigreen, says, "India has envisioned a clear roadmap for a major transformation to electric vehicles (EVs) by 2030. Last Mile Transport is the segment that will convert first to full electric, followed closely by intra-city buses. The shift is clear in last-mile logistics with announcements from all e-commerce and FMCG companies. The government's keenness to eliminate the pre-existing roadblocks by making swift policy changes for sustainable mobility is encouraging growth in the segment. A P&S intelligence market study states that the EV market was worth $536.1 million in 2019 and is projected to expand at a robust 22.1 per cent during 2020 to 2030. This is a huge opportunity for India to not just achieve its sustainable targets but also emerge as a global EV manufacturing hub. India can be a global leader in both EV adoption and component manufacturing by 2030."

> **The operating cost efficiency that electric vehicles (EVs) offer is close to 30 per cent compared to normal ICE trucks, and this gulf is increasing with rising fuel costs**
>
> **— Pushkar Singh**

The pandemic, inadvertently, has accelerated the push towards EVs. It has realigned the focus on environment and sustainability, with a thrust on EVs. The e-commerce and the hyperlocal delivery business have been quick adopters of EVs, partnering with multiple mobility players to cater to demand.

However, there are three major challenges to EV adoption which need to be addressed urgently. The higher acquisition costs,

absence of charging infrastructure and an EV manufacturing ecosystem for both vehicles and batteries are some of them. In earlier years, EVs failed because of excessive battery prices and very short driving ranges. As EVs have become one of the major research areas in the automotive sector, the magnitude of these problems has been notably diminished. Says **Dr Akshay Singhal**, Founder, Log 9 Materials, "Availability of a widespread charging infrastructure is a key driver for EV adoption in India and forms a central factor in the customer experience. However, building the same is a capital-intensive process which makes it a chicken-egg scenario. For the

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— Prasad Sreeram

EV demand to pick-up, charging infrastructure is a critical requirement. On the other hand, to justify the charging infrastructure costs, a critical mass of EVs need to be functional on-road. Additionally, to minimise downtime and maintain operational efficiency of commercial vehicles, fast-charging is a must. Fast-charging requires the availability of high amounts of power across localities, superior safety components, and real estate, among others. Nevertheless, the government can lead by example with an initiative to set up public fast-charging infrastructure (either by setting up a new company/via PSUs/ PPP model), which can significantly ease the transition to EVs."

Echoing on the same lines, Saran adds, "India needs a robust charging infrastructure to meet the needs of passenger EV adoption and inter-city cargo transport. While smaller format vehicles like 2- and 3-wheelers can be slow-charged on regular 220V/16A sockets, larger vehicles are better served through DC Fast Chargers. The latter are expensive (₹4-5 lakhs each). Lack of space is another hurdle for installation of such chargers. Industry reports say that majority of car owners in the country

Prasad Sreeram
CEO and Co-Founder
COGOS

Dr Amitabh Saran
Founder and CEO
Altigreen

don't have a private parking space especially those living in congested communities and hence are not willing to adopt EV. The Central Electricity Authority (CEA) reported that India had established 927 charging stations nationwide as of June 2020. Since this is at a nascent stage, it is significantly less when compared to the 57,000 petrol pumps which the country has across various states."

Further explaining the challenges being faced related to the infrastructure, **Vineet Agarwal**, MD, Transport Corporation of India (TCI), says, "EVs have emerged as a viable solution to the current climate crisis that we are facing. The government has started taking initiatives towards the electrification of its public transport system, along with micro-levels schemes to encourage consumers to embrace sustainable mobility solutions. However, the main barrier to accelerating EV adoption in India is the lack of EV charging infrastructure. Despite the remarkable growth that the EV industry has witnessed in recent years, there are not enough charging stations, and most of them are located in the metros. Another challenge in the widespread adoption of electric mobility is the high upfront cost of these vehicles. The lithium-ion battery, which is the most widely used energy source for EVs, is not manufactured in India. The sourcing of raw materials, especially rare earth metals which are a critical component used in making the EV batteries, remains another challenge in this area. This, combined with the import cost of EV batteries, adds to the manufacturing cost of electric vehicles, resulting in the sky-high purchasing price."

According to **Vipul Bhalla**, Senior Regional Manager Cargo Indian Sub-Continent, Oman Air, "We have to recognise that this is still new technology and the space is rapidly changing across the country. Infrastructure is growing and so are the numbers of EVs on the road. There is still scope for improvement to address issues like compatibility of charging infrastructure, quick activation of already installed chargers,

The EV market was worth $536.1 million in 2019 and is projected to expand at a robust 22.1 percent during 2020 to 2030

— Dr Amitabh Saran

single database for charging locations, reliable power and internet connections, stable software/firmware upgrades. The government has already announced a plan to ensure all highways get enough charging locations, making inter-city travel convenient and reducing carbon footprint."

Another major concern related to the EV manufacturing in India is heavy dependability on China for raw materials. Expounding on the issue, Singhal says, "India severely lags behind China in manufacturing of conventional Li-ion batteries. The unavailability

of raw materials, processing industries, cell production, ancillary components at both the cell and pack level, and essentially the entire Li-ion value chain in India creates an extensive dependency on China. It also gives China an upper-hand to control the flow/pricing of the entire supply chain creating a major hurdle for the growth of Indian technologies. For a scalable wholesome solution, there's a need to build an EV industrial ecosystem consisting of as many components in the end-to-end value chain. Additionally, focus on chemistries wherein capacity competency on the global scale is still achievable should be of utmost priority to also balance the cost dynamics. Further, before being too worried about materials we do not have availability in India, it's of utmost importance to develop local competency of producing battery grade variants of simple materials like aluminium, copper, etc."

Supporting to the need of the hour to be self-reliant in manufacturing EV raw materials, Saran says, "China has a strong grip on various components of the EV ecosystem especially in the sub-2kW category. With a huge domestic manufacturing base, they have brought the prices down tremendously. However, these components are not designed for India's environmental needs or drive profiles. India needs to develop a strong EV supply chain for its own needs and reduce the dependence on imports. The government and other financial institutions should extend support for the capital expenses needed to build these components. This will ultimately reduce the cost and make it more affordable and convenient for customers as well as manufacturers, leading to higher numbers of sales."

Despite these challenges, the market for light electric commercial segment has seen a steep rise in the last few years, in passenger as well as last-mile logistics. Their lower total cost of ownership and lesser operating costs have made EVs more attractive.

Further, the Central and various state governments have been enthused and the sentiments around EVs are now positive. With new policies and a budding start-up culture, companies are cashing on the market opportunity in sectors like two-wheelers and intra city movement. According to the report by the World Economic Forum 2020 (WEF), e-commerce is set to grow exponentially in the next few years, as the safety risks due to the pandemic will linger. In the wake of this, electric vehicles in the last-mile delivery within the city would become the preferred choice given the lower TCOs and operating costs for commercial uses. Says Saran, "The Indian government has set an ambitious target of 30 per cent EVs on-road by 2030. One of the hurdles to it is the price of the battery pack, which is about 40 per cent of the vehicle cost. The extension of Phase II of Faster Adoption and Manufacturing of Electric Vehicles in India (FAME India) scheme until March 31, 2024, is boosting the confidence of EV manufacturers to compete with the ICE counterparts that are comparatively popular and cheaper. Additionally, 50 per cent increase in incentives for electric two-wheelers to ₹15,000 per kilowatt and an increased cap on incentives at 40 per cent of the total price is already giving an impetus to the industry. It has also mandated Energy Efficiency Services to procure 3 lakh electric three-wheelers for different uses. These decisions will drastically help the manufacturers to cut the cost of electric models by ₹10,000-20,000 and to make them more cost-efficient for Indian users.

Dr Akshay Singhal
Founder
Log 9 Materials

Additionally, the country has efficiently scaled-up battery manufacturing under the Make in India initiative that is bolstering its position as an important player in this segment globally. India will soon become the hub of battery manufacturing and the increasing interest from foreign investors will pave the way for all-round growth. At present, India is working fast to install a renewable energy capacity of 175 GW by 2022 and 450 GW by 2030 as a part of its global climate change commitments and development of EVs and with FAME II will be a big boost."

> **Availability of a widespread charging infrastructure is a key driver for EV adoption in India and forms a central factor in the customer experience**
>
> — Dr Akshay Singhal

Adding further, Singhal says, "The PLI scheme will certainly help in boosting the manufacturing of batteries, bringing down the cost of the same, thereby making EVs more affordable. However, looking at the global distribution of installed capacity for conventional Li-ion battery (chemistries like NMC or LFP) manufacturing for Electric Vehicles, India seems to have already missed the bus. Especially in countries like China (60% of global capacity) and the United States (15% of the global capacity) where the entire value chain has also been established. Achieving cost competency with such batteries is going to be an enormous challenge. India can

FACT FILE

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therefore focus on the research, development, manufacturing and scaling of more novel chemistries and build apt use cases around the same. With that approach, our country can achieve global leadership in multiple niche applications, and the manufacturing of batteries deployed in such cases is also supported in governmental policy."

Expounding further on the government policies, Agarwal says, "The government has undertaken multiple initiatives to remove these obstacles, and the recent amendments in FAME II will further promote the manufacturing and adoption of electric vehicles in India. Both EV manufacturers (including OEMs) and customers stand to immensely benefit from the revised FAME II, which aims to lower the purchasing cost for EVs by 10-15 per cent through increased subsidies. In addition to demand incentives, the policy changes will bolster India's efforts to develop a robust EV charging station network. The commercial EV segment, will receive a significant boost in this regard. Such interventions coupled with the ongoing focus on infrastructure development can accelerate the growth of EV adoption."

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— Vineet Agarwal

The shift is already happening. With the unprecedented rise in demand for doorstep deliveries and the growth of e-commerce, EVs will be the choice for last-mile delivery. Even as the acquisition costs of an ICE are lower now, as technologies evolve and battery costs come down, EVs in the future will become more economical. On the demand side, the government, along with the industry should look at further educating consumers, bursting myths, and position EVs as the future of India's transportation ecosystem. Adds Agrawal, "Sustainable mobility solutions are very important for the future and the improved incentives for electric two-wheelers will increase penetration. We are currently seeing the adoption of EVs for last-mile deliveries in the logistics sector, especially in the e-commerce segment. As an integrated multimodal logistics solutions provider, we can envision a future where electric trucks will play a key role in sustainability and supply chain automation. The collaboration between large OMCs (Oil Marketing Companies) and DISCOMs will play a crucial role in strengthening the EV charging infrastructure. We also expect an increase in the number of home-grown manufacturers of semiconductors, which will contribute to the growth of India's EV industry. Local production will pick up the pace, with leading automobile manufacturers coming forward to assemble EVs in India."

Vineet Agarwal
MD
Transport Corporation of India (TCI)

Adding further to the future of EVs, Bhalla says, "It is extremely bright. The community is growing with a lot of people showing interest. As an EV owner, and perhaps the only one at the moment at the Delhi Cargo Terminal, I get stopped very often as people are curious about the vehicle and its potential. People have been driving EVs for nearly 10 years since the time of Reva/e2O brands. As the ecosystem settles down, it is just a matter of time before the larger electric vehicles will take to Indian roads.

A number of start-ups are already pushing the EV story to every corner of India. EV owners have already been to destinations like Lahaul-Spiti and Gangotri, high up in the Himalayas. EV journeys have been undertaken on long routes like Mumbai-Delhi-Mumbai and many more.

Most people are not aware that some of the EVs recharge themselves coming downhill, so a vehicle leaving Mussoorie with a 30 per cent charge will gain power and arrive in Dehradun with a charge of 50 per cent. Some EV owners have now installed solar panels at their locations bringing their electricity cost down even further apart from earning money from the government with net-metering schemes that give credit for supplying electricity back to the grid. This is a huge attraction for our mileage conscious society along with low cost per km along with environment benefits. Government push with subsidies, tax rebates, zero road tax, increasing charging infrastructure are all moves in the right direction."

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— Vipul Bhalla

Vipul Bhalla
Senior Regional Manager Cargo Indian Sub-Continent, Oman Air

The shift towards electric mobility is inevitable. What we need is a steady push and an indigenous ecosystem to make EVs more affordable and accessible.