

## VISION 2030 – COMPLETE TRANSITION TO EVS: ADOPTION, DEPLOYMENT, OTHER CHALLENGES

**On-demand services and features provide secure, Connected-Car Services and Lifecycle Management, allowing for vehicle to update and upgrade throughout their product lifecycle.**

Electric vehicles (EV) have been on Indian roads for around two decades. However, the conscious, visible movement towards e-mobility began earlier this decade, as auto-rickshaws transitioned to e-rickshaws in 2012 in some metro cities as part of the government's initiative to ensure cleaner mobility in last mile connectivity. The focus on e-mobility is much stronger and is happening at a faster pace. The government is facilitating a move towards EVs, supporting it not only with various policies and norms, but also with favourable tax incentives and subsidies.

There are concerns over the transition from petrol/diesel-powered vehicles to EVs. However, the sales of EVs is slowly garnering speed, contrary to popular belief. The Rs 10,000 crore push through the FAME II scheme and lower taxes on EVs & components and tax deduction on loans taken to purchase EVs have set the ball rolling, in terms of policy facilitations.

India, the largest two-wheeler market in the world, sells around 2.5 crore vehicles annually, of which two-wheelers comprise 78 %, unlike European and American regions, where cars form the bulk of sales. The country also relies heavily on public modes of transport, which the government wants to leverage with increased electrification in the shift towards e-mobility. These factors are critical in the e-mobility shift.

Two-wheelers, three-wheelers and buses will be at the forefront of the EV transformation, thus paving the way for awareness about cleaner modes of transportation, reduced air pollution, customer acceptance, and charging infrastructure development. The wide-scale adoption of EVs will also lead to a shift in the way we perceive mobility, with densely populated cities such as those in India additionally promoting shared EV mobility and increasing the potential for developing islands of sustainability in our cities.

### CHARGING INFRASTRUCTURE DEVELOPMENT

India is a cost-conscious market that requires a strong recommendation through cost-benefit analysis and total cost of ownership to move to a new technology such as EVs. For decades, Indians have been used to fossil fuel-powered vehi-



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cles, and the populace is familiar with its operations and potential costs. EVs mark a transformation not just in vehicle type but also in lifestyle. There are concerns over the viability of EVs across different geographical areas and lack of charging infrastructure support. This is already being addressed by the Union and State governments, via direct government initiatives or public-private partnerships to set up charging stations.

The focus is currently towards launching e-mobility solutions for the community, which ensures that the required infrastructure is in place as the populace begins to adopt this solution. Increased usage of EVs on roads will demand higher electricity generation and this would require power load balancing and renewable energy sources to make them a greener and sustainable alternative. This would require a strong grid and charging infrastructure as well as a sizeable R&D investment. The government under its FAME II scheme has earmarked ` 1,000 cr to set up a charging infrastructure network across cities.

Proposals to incentivise users to charge EVs during non-peak hours are being considered by offering reduced tariffs during such times of the day. The Power Ministry has laid out guidelines and listed cities that offer the most favourable environment to move towards EVs. These are cities with high pollution levels and headcount exceeding four million residents. The list includes Delhi, Mumbai, Chennai, Bengaluru, Kolkata, Surat, Ahmedabad, Hyderabad and Pune.

### BATTERY TECHNOLOGY

The second big challenge is the battery – in terms of range

# SPECIAL Feature

and cost. While considerable R&D has been conducted on the battery technology, the most popular material still remains lithium-ion – a limited, expensive resource. A battery forms the biggest cost factor in an EV, posing a barrier to its adoption. This is further complicated by the fact that the technology or the battery itself is imported, thus adding to the EV cost.

Earlier this year, Bharat Heavy Electricals Limited (BHEL) announced a joint venture to manufacture lithium-ion batteries in India, which could help reduce the price. The Indian Space Research Organisation (ISRO) is also conducting knowledge transfer about its lithium-ion technology to as many as 10 companies. ISRO's Vikram Sarabhai Space Centre (VSSC) has developed and qualified lithium-ion cells of capacities ranging from 1.5 Ah to 100 Ah to be used in satellites and launch vehicles. The knowledge transfer will help develop more efficient batteries that can be produced at a lower cost and manufactured locally.

NITI Aayog hopes to promote 'Make in India', where EVs along with its components are manufactured in India. Its proposal to set up a 'Giga-factory' battery cell manufacturing is a step in the right direction and will help reduce our dependence on other countries for our future needs.

Meanwhile, Indian start-ups are also experimenting with various materials to develop more efficient, cost-effective technologies for the future.

## CROSS-COUNTRY DEPLOYMENT

The process of creating a manufacturing EV ecosystem in the country will itself be a challenge for OEMs. To balance the demand from switching over to BS VI-compliant conventional vehicles and the upcoming demand for migration to EVs, automakers need to decide between developing a new platform for EVs and modifying existing platforms available from conventional vehicles to meet the requirement. Adopting existing platforms could be more economical, but the same might compromise on range, EV component packaging, dynamic performance, interior space and comfort. The emphasis should be on reducing development costs while ensuring safety, performance and range. We would need India-specific methods of optimal integration of platforms, battery packs, thermal management systems and electric drives.

Similarly, component makers will have to adapt simultaneously and work closely with OEMs to provide necessary support to make this transition and to achieve the government's proposed deadlines for the EV switch. Along with traditional

component suppliers, we can expect a newer range of firms developing to service the needs of the nascent EV industry. With the EV industry being a constantly evolving one, technologically innovative and agile start-ups with innovative business models will find themselves ample opportunities to establish, grow and contribute to the advancement of EVs in India.

The EV industry would also need considerable upskilling of the current workforce and training new generations to supplement the transition. Relevant courses in colleges and universities and on-the-job training in organisations should be undertaken to ensure upskilling the existing and incoming automotive workforce.

Another hurdle posing the EV transformation is that India has recently adopted Bharat Standard VI (BS VI) emission norms to bring us on par with the European emission standards. Therefore, automotive companies in India have been regulating the vehicles to meet the norms. Manufacturers, therefore, will have to invest additional money and working hours in EVs now, while the Return on Investment (ROI) from BS VI is yet to be realised.

While smart solutions are promoting the adoption of EVs in India, the sector is in dire need of rigid push from the government and innovation for ease in doing business. EVs are a great adoption in conserving the ecosphere for forthcoming generations and will prove to be beneficial for the Indian populace.

## LOOKING TO 2030

The question would still remain – will India achieve 100 % electrification in its auto industry by 2030? There are various challenges to achieve that goal, some currently known and others unforeseen. However, we are at the cusp of one of the greatest transformations of the automotive industry across the world. Electric mobility will pave the way towards further transformations and Intelligent Transportation Systems – leading to autonomous mobility.

It sets the stage to develop and implement more technologies that will create safer, faster, and more efficient transport systems, while changing the way we perceive transport. The groundwork done today would have a keen impact on the pace we progress towards further transformations.

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