Your next car should be electric. But do the math first before you decide to plug and play

Massive funds required to transform India's electrical grid to cope with transition to electric vehicles will need a wholesale change in policy making.

KUSHAN MITRA 17 April, 2022 10:16 am IST

An electric vehicle (EV) parked at a charging station in New Delhi | Representational photo: T. Narayan | Bloomberg

Slowly but surely, many of the concerns about electric cars are being resolved. Range? Most electric cars available in the market today have more than enough range for a few days of office commuting and the better ones can easily handle a drive from Delhi to Jaipur or Chandigarh with range to spare. Charging points? There are hundreds of new charging points opening up across most Indian cities, big and small, as well as highly-traversed highways. There are even charging stations now up in Ladakh. Initial costs? While electric vehicles remain on average 50 per cent more expensive than their internal combustion engine (ICE) siblings, an increasing number of 'affordable' (sub-Rs 25 lakh) electric cars will be entering the market in the next few years.

And then, there is the operating cost of electric cars, which is by far their biggest trump card, because make no mistakes, very few people are going to buy an electric car for altruistic reasons such as reducing pollution. But when they realise that cars like the Tata Tigor EV cost just over a rupee a kilometre to operate versus around 7-8 rupees for the Tigor's petrol version, the additional four lakhs for the Tigor EV feels like a bargain. At the end of the day, you don't really need to be a clairvoyant to see that petrol and diesel prices at the pump are only going to go upwards in the near future.

Luxury EVs

Heck, even the Audi e-tron quattro, one of the best electric cars available in India right now, all of Rs one crore, costs just a couple of rupees a kilometre to operate. The Audi Q5, its closest ICE sibling which features a petrol engine drinks Rs 12-15 worth of dinosaur juice every kilometre. While that might not make the additional Rs 35 lakh for the electric Audi worth it, the e-tron is slightly larger, more powerful and actually slightly better to drive. Sure, the maths may not make sense today, but with better batteries on the way, which not only promise more range, the likes of Toyota's first electric car built from the ground-up, the bZ4X, are promising that batteries will even age better, holding up to 90 per cent of their charging ability even after 10 years. This takes care of another concern of the buyers — how much a battery will cost to replace. Incidentally, most electric cars sold today offer eight-year guarantee on the battery packs.

In the past week, I drove the upcoming Volvo XC40 Recharge, an electrified version of the Swedish carmaker's Sports Utility Vehicle, and while its launch is still a few months away, the electric version is genuinely a 'pocket rocket' with over 400 horsepower, more than double that of the diesel-powered XC40. The car was more proof that electric cars are incredibly good fun to drive and outperform their ICE siblings by a wide margin and that isn't just speeding off from the start-line. While the battery packs on electric cars, usually located between the front and rear axles, are heavy, such a lump of low-slung weight and the instantaneous power delivery form the batteries, electric cars can go around corners seemingly defying the concept of centrifugal force. That holds true for top-end Tesla's and even the Tata Tigor and Nexon EV's.

But it is not all smooth sailing

The super-low operating costs is contingent on owners being able to charge their cars at home, as residential power rates are far cheaper than commercial and industrial rates all across India. In Delhi, a BSES Rajdhani user would pay eight rupees a kilowatt-hour (kWh) at home. Charging at commercial charging points can cost upwards of Rs 20 a unit. For home charging, a secure and most importantly assured parking slot is the best solution to charge these vehicles. With most Indian car owners parking haphazardly in the streets, this will present a problem.

Some electric scooters with removable batteries can be charged at home, but that's not an option for electric car owners. Unguarded public infrastructure in India will unfortunately almost certainly get vandalised, but business opportunities could exist for charging stations with multiple charging points to pop-up in crowded parts of cities like Delhi or Mumbai where owners can leave their cars to charge overnight. Of course, that depends on how much people are willing to pay to charge their cars and electric-two-wheelers.

Typical wall-mounted home chargers charge electric cars between 7.2-10kWh every hour, which means that cars such as the upcoming BMW iX 40 with a 71kWh battery pack can easily charge fully overnight parked in the garage. But smaller cars like those from Tata cap their maximum charging speed to just 3.2kWh every hour, but even their 22kWh battery pack can fully charge overnight. But one reason Tata, and even the likes of Audi and BMW cap the maximum speed their cars can charge from alternating current (AC) chargers, which are the fast majority of charging points available, is because of the back-end infrastructure.

And that is the 800-pound gorilla in the electric room. To resolve this, intervention would be required from the very top. Why? Residential connections in apartments in tonier parts of Delhi and Mumbai would have a high sanctioned load, usually 11-12kWh. This doesn't leave much spare 'load' to charge a car, but that can be handled at many households. Increasing the sanctioned load is possible, but while a few houses can increase their load to charge their electric vehicles, if hundreds of households wanted their sanctioned load increased, that would require major investments by the electricity supplier in new transformers.

And to make matters worse, in some parts of the country, Noida, for example, the sanctioned load even in areas like Sectors 14 and 15 is just 5kWh. The situation is similar across many parts of India. And when you consider that at last count, India's state-owned electricity distributors are Rs 1.6 lakh crore in debt, the massive funds required to transform India's electrical grid to cope with the dramatic changeover to electric vehicles will need a wholesale change in the way policymakers think of the grid and electricity in India.