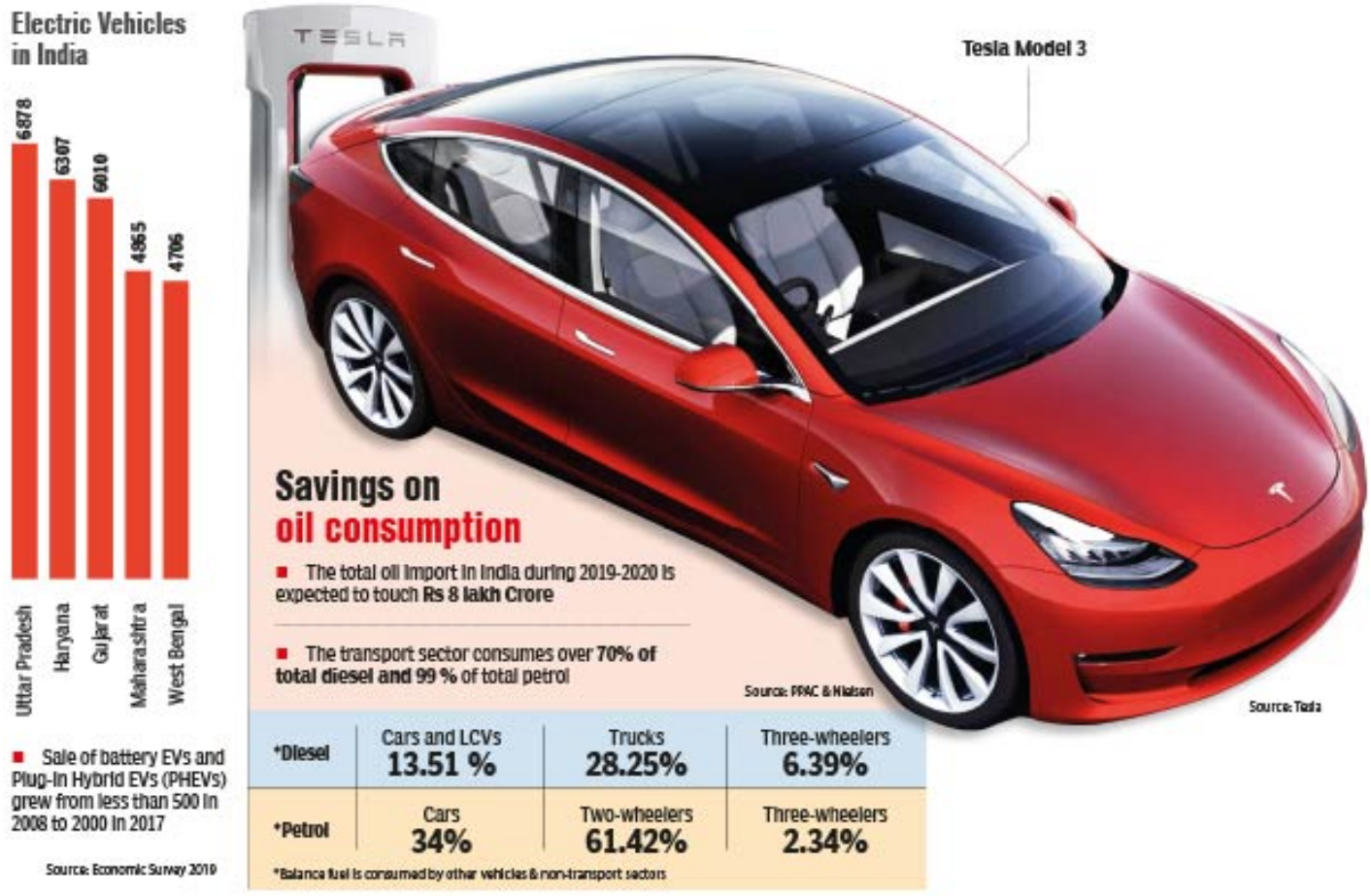
Electric Vehicles: charged up to drive, BUT...

Published: Aug 05,2019 07:00 AM

Although the govt incentivises electric vehicle buyers and manufacturers in a bid to meet an all-electric vehicle mobility target by 2030, industry is reluctant to commit.



Chennai: While the move towards e-vehicles is inevitable, how much time will all of this take? Many Indian manufacturers have announced plans for models launch later this year, but the infrastructure required to make a success of it and lead to widespread adoption by the people, is simply not there. Not just yet.

So, while you can drive your e-car within specific parts of a city like Chennai, you cannot free-wheel like you might do with your fuel-driven car. There are not enough charging points in the city and you will be forced to return home to charge the vehicle.

If the claims of mileage made by e-vehicle manufacturers are true, you might just about reach Bangalore or Madurai from Chennai, but will need a recharge on the way.

India's smaller towns will have to wait for the EV for a few more years. With power cuts plaguing much of semi-urban and semi-rural India, and hardly 10-12 hours of power supply in rural areas on an average, where is the question of charging the car?

Is our grid capable of handling a completely electric mobility? Who will put up and take responsibility for charging infrastructure placed in public places? "The government is already putting up charging points at many places. We will have our chargers too," said one Hyundai official, But here is the catch; at present, there are no standard chargers or charging points, and each car brand will have its own.

The challenges to the e-switch

The challenges for an all-electric vehicle switch are the cost, weight, range of batteries, and the safety and ease of charging. The Centre for Battery Engineering and EVs (C-BEEV) at IIT, Madras is working on minimising these.

The driving range of EVs is reportedly much shorter than ICE (Internal Combustion Engines) that run the normal petrol or diesel cars. Today, EVs are at least 1.5 to 2 times costlier than ICE-vehicles. A Rs 5 lakh ICE model would cost Rs 10-14 lakh in the EV format. But according to Prof Ashok Jhunjhunwala, the vice chairman of the Incubator Cell in IIT-Madras, in the coming 4-5 years, EVs would cost only 10-20 per cent more than the conventional ones.

"Global players have already started mastering the technology. If we don't act now, very soon we will be importing, and we must remember that our GDP and jobs depend on developing these in-house. We should be a pioneer in the EV space and make India a global manufacturing hub," said Prof Jhunjhunwala.

By the end of 2019, Indian car buyers will have multiple EV options to choose from – EVs from auto-makers like MG (eZS), Hyundai (Kona), Nissan (Leaf), Audi (eTron) will range from Rs 25 lakh to Rs 1.5 crore for high-end cars while other smaller models from Maruti, Tata and Mahindra would cost anywhere in the Rs 10–15 lakh range.

However, the target of 100 per cent EV mobility by 2030 is unreasonable. "If we reach 30 per cent penetration by 2030, it will be a reasonably good achievement. More than that is too optimistic," said Ashish Verma from the Civil Engineering department at IISc, Bengaluru.

In order to encourage faster adoption, the government has created a Rs 10,000 crore kitty for Faster Adoption And Manufacturing of (Hybrid&) Electric Vehicles (FAME) which involves the creation of infrastructure needed for e-mobility.

Korean auto-maker Hyundai launched Kona, its first EV SUV in India, priced at Rs 25.30 lakh a few weeks ago. The full battery, with a capacity of 39.2 kWh gives a 452 km driving range. The car comes with two chargers, a 7.2 kWh wall-mounted unit that takes 6 hours and 10 minutes to charge, and a portable charger that takes 19 hours, Hyundai Managing Director S S Kim and his team said. “Currently, we will manufacture 120 Konas; mass production may take time,” Kim added.

The company is also working with the Indian Oil Corporation (IOC) to provide fast charging stations at petrol pumps. Additionally, the carmaker has developed a way to charge one Kona car with another Kona car.

“Other countries have a fixed battery in EVs that need to be charged with the help of a fixed charging point. But just as the huge success in case of gas cylinders in India versus piped gas all across the globe, in India, swappable battery will work better. Nobody has tried this in the world so far. The cost just goes up substantially for fast charging batteries. Luxury EVs may not have a problem with that,” said Jhunjhunwala.

Similarly, for passenger cars, 90-95 per cent cars drive less than 100 km in a day in the city. For them, an overnight charging through a 15-Amp plug point at home will be good enough. But if one wants to travel longer, say to Bengaluru from Chennai, he/she can drive for 100-150 km and then swap the battery with a fully charged one at a petrol pump.

City buses, that run 30-40 km in one trip can rest for 10 minutes, swap batteries and be ready for their return trip.

Coordination, tracking and monitoring

Coordination could be achieved through QR codes and mobile-apps like Uber, Swiggy or Ola, where through apps, the location, details of battery status, differential payment rates, and driving status will be automatically matched with the petrol pumps on the route. It will also take them less time than normal petrol-filling.

What about the cost of disposing used Lithium batteries and its potential to damage the environment? “We are already importing 300 million Lithium batteries for mobile phones currently. More than 90 per cent of that is recoverable and can be re-used. This also gives the mobile-handset manufacturer a chance to make these batteries traceable and to be re-used, and not to just dispose them randomly,” Prof Junjhunwala said.

Electric two-wheelers should be priority


Prabhjot Kaur, CEO, C-BEEV


An engineering student at IIT-Madras driving an e-auto on the campus to show how easy it is to operate

What should the government's priority be? Big cars are not the biggest problem, as they form only 1-2 per cent of the total number of cars in India, said Jhunjhunwala.

"The focus should be on bringing EVs to the two-wheeler (79-80 per cent) and three-wheeler auto (4-5 per cent) segments that together constitute nearly 83-84 per cent of the vehicles. Small passenger cars constitute the rest." said Prof Jhunjhunwala.

A majority of two-wheelers approximately cover 50 km in a day, where they can have their batteries charged overnight, and in case of a longer trip, they could use an add-on battery. The battery costs around Rs 70,000 and is likely to come down with time. Running cost is one-third the cost of running petrol and diesel vehicles.Three-wheeler autos and taxis will have the option to swap their battery with a charged one after a 50-70 km run, from any petrol station. Petrol pumps will have to develop a network of creating charging-bays, where they simply keep charged batteries ready for a swap.

Augastin, an Uber cab-driver in Chennai, however, said, "It depends on how many kilometres I can run on a single charge, how much more I shell out to buy an electric car, and how much time it will take to recharge if my battery drains out in the middle of a trip?" EV experts believe that for taxis, swapping batteries is a better idea than having fast-charge batteries that are far more expensive. There are also likely to be long queues, making it cumbersome and less feasible. In terms of capital cost, they will have the option to buy their commercial vehicle without the battery. That way, EVs will cost much less, with an option to hire or lease swappable batteries.

- Objective of National Electric Mobility Mission Plan 2020 is sales of 60-70 lakh units of EVs by 2020
- FAME was launched in 2015 with an outlay of Rs 795 crore
- FAME II launched in April 2019 with an outlay of Rs 10,000 crore for 3 years
- Karnataka, Kerala, Telangana, Maharashtra, AP, UP & Uttarakhand have drafted EV policies
- AP has set target of 10 lakh EVs by 2024
- Kerala is targeting 10 lakh EVs by 2022
- Maharashtra is targeting 5 lakh EVs
- Telangana is targeting 100 per cent electric buses for intra-city, inter-city and inter-state transport for its State Transport Corporation

CHARGING:

Home based
wall-mounted unit: 1.15 hrs
Public units of 11 kW: < 3 hrs
120 kW super charger unit: 15-20 min

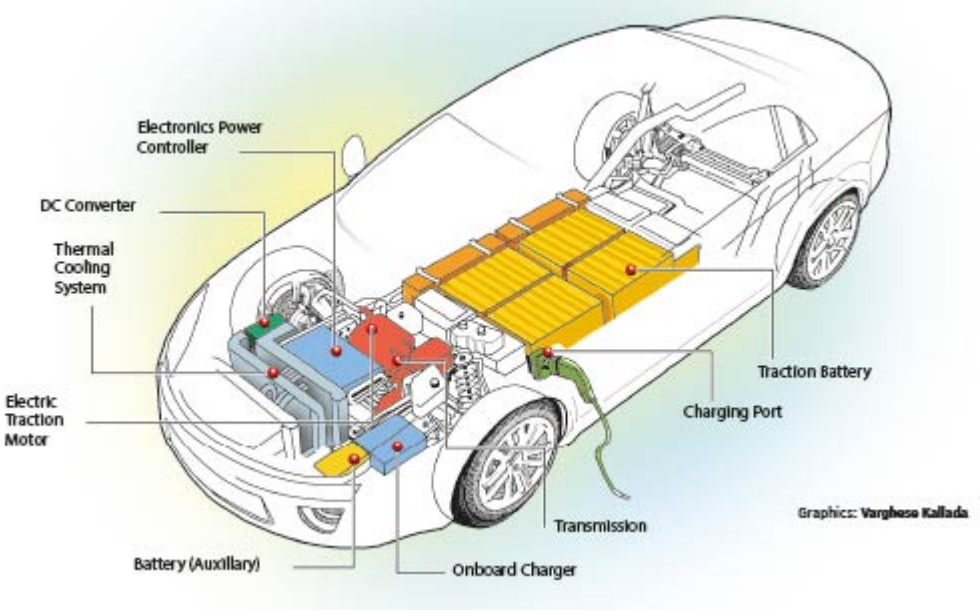
Model 3 which is expected to come to India first

30 min recharge at supercharger will help to run 270 km
Dual Motor— one for power and the other for range
The vehicle can hit a maximum speed of261 km/h
It can run for 620 kmon a full charge
The vehiclecan go from 0-100 km/hin 3.4 seconds

The game-changer EV that has caught the attention of the world

- Tesla cars, which have changed the course of the EV market, are already on the roads in the US and Europe, and are expected to launch in India by the end of 2019
- Tesla was founded in 2003 by a group of engineers looking for a viable alternative to the ICE car
- The Model S has the longest range and fastest acceleration time of 2.28 seconds
- Tesla introduced the Model 3, a low-priced electric car in 2016 and began production in 2017
- Tesla currently has 1,533 supercharger stations with 13,344 superchargers, in 50-odd countries
- In 2015, PM Modi visited the Tesla plant in California, where Tesla Founder and CEO, Elon Musk took him on a Tesla production complex tour
- Auto industry in India is, however, sceptical. “The vehicle has been designed for roads in the US and the environment there. Indian conditions are different. Good roads are not available everywhere and the general environment is dusty. Indian cars also need a different road clearance to drive comfortably here,” a source said
- China has 250 EV operational locations, while the UAE has three
- Elon Musk has kept Tesla fans, potential customers and the auto industry guessing, following his statement in social media: “Would love to be in India. Some challenging government regulations, unfortunately. Deepak Ahuja, our CEO, is from India. Tesla will be here as soon as he believes we should,” last year
- Tesla first launched its Roadster in 2008. Later it designed and developed the Model S, a premium all-electric sedan
- The Model S was the first electric vehicle to ever receive Motortrend’s Car of the Year Award-one of the most coveted in the automobile industry

IIT-Madras incubates start-ups in electric vehicle technology



While big auto makers, including of two-wheelers, are waiting and watching to go full throttle, inspired by the huge success of Tesla, many start-ups in India are turning to be disruptive in order to cash in on the opportunities

eSmito, a start-up being incubated at IIT-Madras, is an early entrant into the emerging EV ecosystem. Another IIT-Madras start-up, Ather Energy, has started taking pre-bookings for their electric scooters to be launched in Chennai and Bengaluru soon. Priced at Rs 1.31 lakh, with a promise that no charging point will be beyond 4-5 km range, they would be managed through a mobile app, with an incentive of free charging for six months.

The company has tied up with a number of cafes, malls and pubs, and large corporate complexes visited by youngsters, where charging ports will be set up at parking lots.

A non-Ather EV could charge at Rs 35 per half hour for two-wheelers and Rs 75 for four-wheelers. All Ather EVs will be charged Rs 20 flat.

“Many youngsters, especially girls, may be taken-in by the craze to drive clean-energy, non-pollutant, noise-less, new-generation stylish EVs. Two-wheeler production could switch to EVs by 2023-24,” says Prabhjot Kaur, CEO, C-BEEV, and promoter of eSmito.

2-Wheelers’GLOBAL Scenario

- 1 lakh EVs and 3 crore electric two-wheelers were sold in 2017 globally
- Sales went up from 2,000 units in 2008 to 10 lakh units in 2017. Over 50% of sales were in China. Market share of EV in China is 2 %, and 39% in Norway
- 0.06% is the share of EVs in the Indian market
- In India, electric 2-wheelers have been a major part of EV sales, with around 54,800 in 2018. There were only 2000 electric cars in 2017
- 4,30,151 Chargers were made publicly accessible worldwide. Almost 30 lakh chargers were available at homes and workplaces. In 2017, only 25 % of these were fast chargers

All you want to know about EV charging and questions around it

How many charging stations will a city like Chennai require?

Industry has estimated that there must be 1 charging station for every 2-3 sq km. Each station will have a minimum of 8 ports and may go up to 20 ports. Slow charging can take up to 6 hours, while fast charging may take anywhere between 10 and 30 minutes. Charging fee may vary between Rs 60 and Rs 80 per charging. Although there are no standard chargers currently, industry expects that by 2022-23, charging ports will all be standardised, allowing owners of one brand of car to use any charging port

How much does a charging port that you can keep at your house cost?

A slow charger-point costs about Rs 20,000- Rs 25 000 each, as compared to fast DC chargers which cost around Rs 2-3 lakh per unit

Will it be possible to charge one model of electric car with the charger of another model?

Industry is working towards making common specifications for charging ecosystem, and just like USB ports or mobile-chargers, as more EVs hit the road, uniform specifications will be followed. And they will be multi-modal. A couple of Indian auto majors working on EVs have already come together to have common specs for chargers. By 2022, most of these issues will be completely sorted out, as more EVs will be bought by people, and the pressure on car makers to universalise these will be greater. By then, FAME-II specifications will be implemented

Can one EV accommodate more than one battery?

Carrying multiple batteries is not a very practical solution as they tend be very heavy and large in size. Swappable batteries are a better solution

If a car owner travels abroad for a month, will he/she be able to use the car immediately?

A battery, even after a month, can retain 60-70 per cent of its charge, and even after the owners come back from vacation they can use it. Also a battery should not be charged to 100 per cent. The user manual will provide all the instructions, including overcharging, and battery maintenance in different weather situations, including rain

Can Tesla make an impact in India? How easy will it be for them?

They will have to invest a lot in order to customise their products as India has a huge range of temperature variations, especially high temperatures during summers. The battery-chemistry is highly temperature sensitive, and the cars made for the US and Europe will find it difficult to run in India as India does not have advanced uniform electric power grids, and rough roads can be very challenging for highly-advanced cars like Tesla. Tesla cars cost more in countries like the UAE that experience high temperatures, as they have customised the batteries for such weather situations. Importing a completely built car will attract a duty of 100 per cent plus GST, so a car priced at $40,000 in US will cost something around Rs 56-58 lakh. Through CKD route, it will attract a tax of 40 per cent; with other costs being the same, it will cost approximately Rs 40 lakh in India

Conversations

0 Comments Sort by Newest

Add a comment...

Facebook Comments plugin