



A STUDY ON FUTURE PROSPECT OF ELECTRIC VEHICLES IN INDIA

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ABSTRACT

This paper discusses about the future of Electric Vehicles in India. The world is rapidly moving towards electric mobility. Under the Clean Energy Ministerial, a high-level forum to promote clean energy policies and programmes, eight countries have committed to the 'EV 30@30' campaign. As part of the campaign, the countries, of which India is a member, aim to achieve a 30 percent electric vehicle penetration by 2030. There are clearly many positives to electric vehicles but several challenges are to be met to accelerate electric mobility. Deployment of a reliable Charging Infrastructure is the key to drive EV penetration in the country. Additionally, suitably addressing the issues of Range Anxiety and Charging Time will be pivotal in the proliferation of E- mobility. Easy and affordable access to charging infrastructure—both standard AC charging as well as rapid DC charging— also plays a central role in meeting customer needs. Effects on the grid due to EV charging needs and other such impacts are to be

assessed and addressed suitably.

KEYWORDS: *Future of Electronic Vehicle in India, sustainable vehicles, Battery Electric Vehicle, Ultra Low Emission Vehicle.*

INTRODUCTION

In recent decades, the environmental impact of oil-based transportation infrastructure, along with peak oil, has brought new interest in electrical transportation infrastructure. Electric vehicles differ from fossil fuel vehicles in that they can generate electricity from a variety of sources, including renewable energies such as fossil fuels, nuclear power, tidal power, solar and wind power, or any combination thereof. The electric vehicle (EV), also known as an electric vehicle, uses one or more electric or traction motors as propulsion. Electric vehicles are mainly those that supply power directly from an external power plant, those that use stored power from an external power source as a power source, and those that use an in-vehicle generator such as an internal combustion engine (hybrid electric vehicle) as a power source. There are types. Or a hydrogen fuel cell. Electric vehicles include electric vehicles, electric trains, electric trucks, electric planes, electric boats, electric motorcycles and scooters, and electric spacecraft. There is a suggestion for an electric tank, a battery-powered diesel submarine is an electric submarine for the duration of the battery power, and some of the lightweight UAVs are electrically driven.

Electric vehicles first appeared in the mid-19th century, when electricity was one of the preferred ways to power a vehicle, providing an unparalleled level of comfort and ease of use for gasoline vehicles of the time. Internal combustion engines (ICEs) are the main propulsion method for automobiles, but electricity is common in other types of vehicles, such as trains and all types of small vehicles. The hybrid electric vehicle combines a traditional (usually fossil fuel) powertrain with some form of electric propulsion. A common example is a hybrid electric vehicle like the Toyota Prius. The Chevrolet Bolt is an example of a production expansion range plug-in electric vehicle.

REVIEW OF LITERATURE

3.1. As per the report environmental impact of Electric and Hybrid Vehicle Because of productivity of electric motors when contrasted with ignition motors, in any event, when the power used to charge electric vehicles comes from a CO₂-emitting source, for example, a coal-or gas-terminated controlled plant, the net CO₂ creation from an electric vehicle is regularly one-half to 33% of that from an equivalent burning vehicle.

Electric vehicles discharge practically no air poisons where they are worked. Also, it is for the most part simpler to fabricate contamination control frameworks into incorporated power stations than retrofit tremendous quantities of vehicles.

Electric vehicles ordinarily have less commotion contamination than a gas powered motor vehicle, whether it is very still or moving. Electric vehicles radiate no tailpipe CO₂ or poisons like NO_x, NMHC, CO and PM at the mark of purpose.

Electric engines don't need oxygen, in contrast to gas powered motors; this is valuable for submarines.

3.2. Environmental impact of hybrid car battery

However half breed vehicles consume less fuel than ordinary vehicles, there is as yet an issue in regards to the natural harm of the mixture vehicle battery. Today most half and half vehicle batteries are one of two sorts:

1) Nickel metal hydride, or 2) Lithium particle;

both are viewed as more harmless to the ecosystem than toxic batteries which establish the heft of petrol vehicle starter batteries today. There are many kinds of batteries. Some are undeniably more poisonous than others. Lithium particle is the most un-harmful of the three referenced previously.

The harmfulness levels and ecological effect of nickel metal hydride batteries-the sort right now utilized in crossovers are a lot of lower than batteries like lead corrosive or nickel cadmium. Nonetheless, nickel-based batteries are known cancer-causing agents, and have been displayed to cause an assortment of teratogenic impacts.

3.3 Raw materials increasing costs

There is an approaching expansion in the expenses of numerous intriguing materials utilised in the assembling of crossover vehicles. For instance, the intriguing earth component dysprosium is expected to manufacture a large number of the high level electric engines and battery frameworks in crossover drive frameworks. Neodymium is another uncommon earth metal which is a critical fixing in high-strength magnets that are found in long-lasting magnet electric engines.

Essentially all the intriguing earth components on the planet come from China, and numerous examiners accept that a general expansion in Chinese gadgets assembling will consume this whole stock by 2012. Also, send out standards on Chinese intriguing earth components have brought about an obscure measure of supply.

A couple of non-Chinese sources, for example, the high level Hoidas Lake project in northern Canada as well as Mount Weld in Australia are at present being worked on; notwithstanding, the hindrances to passage are high and expect a long time to go on the web.

The various articles, previous reports used for this projects has come from various sources Business Standard Newspapers, Mint Newspapers. As per Deloitte’s reports

Gaining traction: Will consumers ride the electric vehicle wave?

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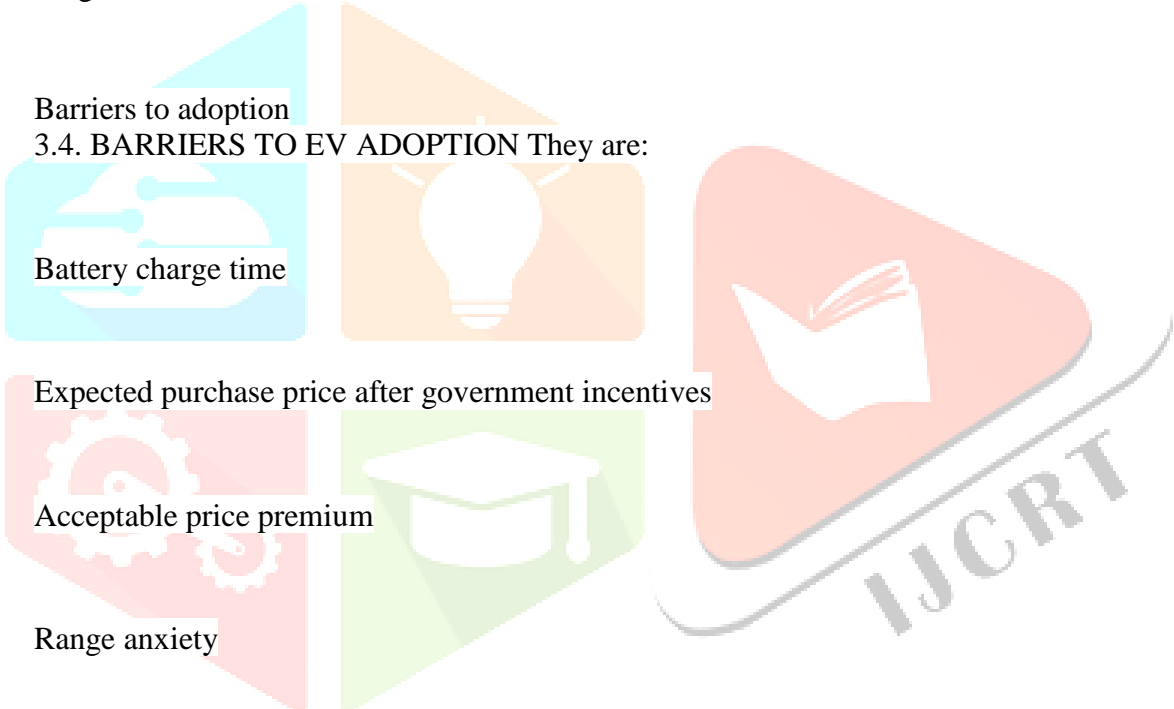
India results

The report broadly covers topics on:

- Market opportunity
- Target customers

Barriers to adoption
 3.4. BARRIERS TO EV ADOPTION They are:

- Battery charge time
- Expected purchase price after government incentives
- Acceptable price premium
- Range anxiety



- E.
- A.
- B.
- C. <4 32%
- D. – 4to733% E. – 7to912%

Acceptable battery charging time

8 hours 24%
4hours 27%

2 hours to 30 minutes 49%

Expected purchase price after government incentives

In INR lakh

Fuel prices

In India, 76% of the total population surveyed would expect an electric vehicle to travel up to 320 kilometres per charge before they would consider purchasing one. This indicates a gap in expectations versus current EV range capabilities in India. While fuel price increase may not be the only factor that drives customers to buy EVs, it is a fact that they have a mental benchmark of 130-150% of the current fuel prices that will make them reconsider EVs.

RESEARCH METHODOLOGY

- The principle reason behind the review was to see the needs and needs of the buy-ers and analyze the data in regards to Electric Vehicle.
- Sample size
For the current review 106 respondents were chosen.
- Examining data
For choosing required respondents basic arbitrary it was utilized to test method.
- Apparatuses and methods
- Target population-
 - People from urban area
 - People of both genders (Male & Female) • Occupation (Job holding/ Self employed)
- Data collection method
 - Primary data- Google form survey
 - Secondary data- Internet, articles, E-magazines ,Interview technique (Google form to the respondents)

The following is the questionnaire format

We the students of Galgotias University are gathering information related to acceptance and knowledge of people about alternative technologies in automobiles such as Electric Vehicles for our Research Methodology project.

Please put a (✓) mark against each option where ever required. 1.Your Profession:

Student		Retired
Self	employed	Job
Other		

2. Gender: Male

Female

Other

3.Do you have any vehicle?

Yes

No

4. Is it a

Two wheeler Three wheeler Hatch Back Sedan

MUV

5. Is most of your daily travelling in city, on the highway or mixed?

City

Highway Mixed

6. Also let us know the mode of transportation you prefer and approx. distance travelled.

Own	vehicle	Taxi/Auto	Rickshaw	Public	Bus
Train					

7. Have you heard about Electric/Hybrid vehicle?

Yes

No

Can't say

8. Would you be interested in owning/converting your vehicle into Electric/Hybrid Vehicle?

Yes

No

Can't say

9.If yes then how much would you expect to be the price of an Electric Vehicle/ Hybrid Vehicle? *
_____ (your answer)

10. What is preventing you from purchasing an Electric Vehicle?

Nothing, I plan to buy an electric vehicle soon

The present cost of electric vehicles is too high

The vehicles available at the moment don't have enough range on a single charge to meet my needs

I need more information about the technology before I would make a purchase

It would be difficult to set up charging in my building/home

11. Would you like to know more about Electric/Hybrid vehicle?

Yes No

12. If yes from which source? Television Ads

Auto expo

Magazines

Live demo Internet

13. Where would you prefer to charge your Electric Vehicle if you were to buy one in the future?

At home

At work

Using public charging facilities

14. What should be the range of an Electric Vehicle when fully charged? (In approx.)

Less than 100 km 100-150 km 150-200 km other

15. What should be the expected maximum speed of an Electric Vehicle? (In approx.)

Up to 80 kmph 150 kmph other

DATA ANALYSIS

- Number of males are more compared to females who have opted for the survey.
- A large no. of people have their profession as student and then job.
- Two-wheeler owners were more interested in buying/converting their vehicles into Electric/Hybrid vehicles.
- Most of the respondents prefer their own vehicles for daily travelling.
- Most of the people have their daily travelling in the city as well as on the highway (mixed).
- A major section of respondents has shown much interest to get more details about Electric/Hybrid vehicles technologies.

- Most of the respondents expect the price of their electric vehicles should be between 15,00,000-20,00,000 INR.
- It is assumed with this price they are interested in converting their existing car into Hybrid Vehicles. It was found that
 - The present cost of electric vehicles which is too high
 - The insufficient range on a single charge
- The lack of information about the technology before
- Majority of the people would like to know more about Electric Vehicles from Internet and Live Demo.
 - Almost all of the respondents would prefer to charge their vehicles at home which is a cause of concern as development of such infrastructure is still in nascent stage.
 - Though it was found that majority of the respondents daily travel around 80km, however still most of the people would expect an Electric Vehicle to travel around 80 to 150 km on single charge.
 - Speed of the Electric Vehicle is not a concern with people for buying an Electric Vehicle.

STUDY LIMITATION

- Due to constraints of time and sample responsiveness, the sample size is limited.
- As the questionnaire was condensed; certain factors could not be studied in depth.
- Nevertheless the questionnaire did provide relevant data for the study.
- More of the information provided in the project is collected from the officials of the organisation.
- The time allowed for this project was 2 months.

RECOMMENDATIONS

- More affordability - price of EV should be affordable by people of both classes (higher & middle).
- More charging stations - there should be enough charging stations in the city that people don't need to wait for their changes for so long.
- Subsidies on EV from government - government should pay more attention to sub- sidies on EVs. For example- less road tax, etc.
- More competition on EV market - All these focus would bring more competition in the market and people will be willing to buy EVs.
- The speed range of EVs should be more than diesel/petrol. At least it should be 300 kmph.
- Focus of government and manufacturers should be on advertisement of EV like in auto expo and on television.
- Car manufacturers should focus more on EVs than petrol & diesel vehicles.

CONCLUSION

- Thereactionsforthepollendedupbeingessentialforthefinishofourexplore as the outcomes were positive and where coordinating with what was anticipated by us.
- TheimpressionofindividualstowardsEVsisas yet inadmissible as a significant part of our general public is as yet ignorant about different Alternative Technolo- gies utilised in Automobiles.
- TheongoingEVsdon'tmeasureuptothebuyer'sassumptionstoabiggerdegree.
- TheGovernmentInitiativestakenfortheadvancementofEVsisstillincreasing stage and ultimately depends on papers, however different organisations have been framed and different plans have been brought by them yet at the same time its exe- cution isn't yet done.
- The buyers will favour EVs provided that they are tantamount with current vehi- cles on street, so an adjustment of purchaser's way of behaving is significant. They ought to steadily turn out to be more cognisant about the utilisation of cleaner ad- vances.
- Howevernumerousbuyerswon'tfavourtheflowElectric/Hybridvehiclesyetat the same time there are loads of choices accessible which is worked to measure up to shopper's assumptions.

- Showcasing of such items will truly assume a significant part as venturing foot towards greener environment.
 - Different organisations sought to take drive to advance electric vehicles as a piece of their corporate social obligations.
 - At long last the fate of the Electric/Hybrid Vehicles is green.
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