

Study on Electric Vehicles in Delhi NCR : Future Prospects and Possibilities

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Abstract - E-Vehicles are quickly taking over the market with various reasons and factors coming into play -increasing pollution, government efforts to move towards a more sustainable environment and also increase in the consumer awareness due little but visible effects of climate change. While the articles focuses majorly on Delhi- NCR but it also gives a glimpse about EV market in whole India and world. The research project explores the nascent market of EV's in India mainly in Delhi & NCR region, researchers have taken the study to know the challenges and arduous effort required to establish the infrastructure- understanding these challenges and explaining how they can become an obstacle in the road ahead. The project explores consumer behaviour towards EV's. This study conducts primary analysis, and the responses have been collected through online survey with this analysis we have tried to depict the picture of consumer preference and the factors that depict their behaviour towards the EV's it also gives us an idea about the future prospect & possibilities of EV

1. INTRODUCTION

Mobility is very important aspect for economic development in urban place, it can boost the economic development as it fosters trade mobilizing human resource from one place to another place. People's basic needs and facilities like healthcare services are met. A good mobility is a very important for the modernization of the company, in countries like India and various other countries these mobility infrastructure are already at their limits. Transportation constitute a major share when it comes to carbon emission, whether it be emission by the car or while extracting petroleum. Emission caused by transportation is on increase yearly at the rate of 2.5%. Particulate matter is of great concern in some countries it can be 12% and in some it can go up to 70% of the total content of of the pollution caused by transportation. Some low and middle income countries especially countries like India with such dense populations suffer disproportionately. Transition to the sustainable mobility is on the way, with world already concerned about the consequence of not being able to solve the climate problem; world coming together and deciding a common sustainable goal for the future, because of which agreements like Paris Agreement came into action and every country deciding their own contribution through Nationally Determined Contribution(NDC), world is changing and because of involvement of government at international level this sustainable mobility will be more easily achieved. Electrification of vehicles comes with in hand gift worth trillion of dollars, at the same time also being able to improve the lives of million of people, other endangered species and protecting the overall environment. Although there are other options for sustainable or say carbon neutral mobility – fuels like hydrogen, but we are not able to completely harness the power of the hydrogen efficiently that is why it is also called fuel of the future. At the current moment the most viable option to shift towards sustainable mobility is electrification of vehicles and with advancing technologies from the private sector and government effort has increased the pace of this transition. The world still lags behind to meet the Paris agreement target, it shows the transition to complete electrification may seem to be at greater pace but in reality we still lag behind with a big margin India can become a representative of developing countries in this transition. India needs to focus a lot on electrifying vehicles in this decade or else millions of more combustion engine vehicles will be added.¹

1.1 International Scenario

Going with the global ev outlook 2020, sales of ev reached 2.1 million worldwide in 2019, breaking the 2018 record. China sustained the position of the world's largest ev market, having 2.3 million ev's in active use. It is the nearly half of the global stock of ev's. As compared to China, Europe and USA are far behind, that was in absolute term if we go for relative terms picture of Europe looks quite more positive. For e.g - Norway has 56% of vehicles as electric compared to 5.6% of vehicles of China, following the path are Iceland and Netherlands with 25.5% and 15% respectively. With all these figures it is clearly visible that world was shifting towards ev's rapidly, India shall waste no time entering the EV racecourse to be at par with the world.²

1.2 National Scenario

India with its massive population is moving forward with rapid pace of urbanization and industrial growth; demand for transport vehicles will continue to increase with this rapid urbanization. With urban population expected to touch 40 % by 2030, increase in the vehicles running on crude oil will be deteriorating the air quality. The dependence on crude oil is adding to the cost of imports but deteriorating air quality has more drastic effects – causing close to 16.7 lakh deaths in 2019 and economic loss which is close to \$ 36.8 billion. This is a major quandary for the country. It has to look for a sustainable option, an option which is environmentally friendly, an option that leads to a healthy and cherished nation.

India also pledged in the Paris Agreement in 2015 to reduce its per head emission by 33- 35% by 2030. Vehicles being the major contributor in the air pollution need to be sustainable i.e. running on the clean fuel, among which electricity is the most viable option in the present scenario, but for that the country needs bring major policy changes from the side of the government for developing a good infrastructure e-auto setting up charging stations at a large scale, setting manufacturing hubs for electric vehicles, providing incentives, promoting startups. Private sectors also have a major role. They together with the government can create a synergy and can give a huge boost to this electric vehicles sector in India.

Countries who are transitioning to EV's are doing it on the basis of their economic development and tech abilities and political selection, but in India particular set of circumstances are favourable and thus speeding the shift towards EV. These reasons are :

1.21 India is prosperous in terms of renewable energy.

1.22 India has a well trained manpower who are empowered with astonishing skills.

1.23 India has a well established infrastructure and customers who are comfortable in adopting new tech to speed up the process of development.

1.24 Above all India has a culture of appropriating assets for the benefit of everyone.

This dynamic environment that India has will help the country to move on a parallel track with major countries who are quickly shifting towards electrification of vehicles. The Government's efforts will help create leadership in the EV segment, it would be a major initiative towards the automobile sector and developing India's own individuality in this segment.

2. India's Policy Overview

Efforts made by central and state governments are turning India into a global electric vehicles hotspot. Central government came up with the Faster Adoption and Manufacturing of Hybrid Electric Vehicles (FAME II) policy and state governments are coming up with their own state specific EV policy. Based on the roles of the policy, policy can be categorized as 'supply' and 'demand'. Central government's and Delhi Government's policy headed by GNCTD offer purchase incentive which decreases the price of electric vehicles making it a little affordable for people. Delhi Government is offering a purchase incentive of Rs. 30,000 on e-autos, it is also offering scrapping incentive of ICE vehicles upto Rs. 7,500. These efforts can help bridge the gap between ICE vehicles and electric vehicles. Many state governments have done the opposite by focusing more on supply incentive which will increase the job opportunities in the respective states. Aside from the policy incentive other measures such as reduction in GST on EV and EV charges have been introduced.

Faster Adoption & Manufacturing of Hybrid and Electrical Vehicles (FAME), this scheme was introduced in April 2019 as a step to boost the pace of electrification of vehicles. With a plan of spending INR 100 billion over the course of 3 years i.e. till FY2022, to provide demand incentive of 2W, 4W and buses. Incentives for 3W and 4W will be applicable for the vehicles used as public vehicles or a commercial vehicle and 2 W will be applicable for privately owned vehicles. Amount of incentive will depend upon the capacity of the battery used in vehicles. This scheme also foresees development of charging infrastructure. To ensure technological development within the country, there is eligibility criteria which specifies the scope within which incentives will be granted. Vehicles with lithium battery tech, having 50% of components developed locally will be eligible for subsidy. The criteria will also include range of vehicles, electricity consumption and other similar aspects. Many states like Tamil Nadu, Uttar Pradesh and Telangana have focused on supply based incentives in order to generate employment in their respective states.³

2.1 Vision of Delhi Government

The vision was to set Delhi as a leader in Electric Vehicles in India, with efforts to move forward for transitioning to electric vehicles in all the vehicle segments – whether it be public transport, two wheeler. The aim of the government is to increase the pace towards transition to electric vehicles, so that by 2024, 25% of total registration is for Battery Powered Electric Vehicles, while the bull's eye is to bring down the air pollution in Delhi because of which people in the National Capital Region are suffering. Government also aims to take benefit of this transition and make jobs available in the field of financing, servicing, setting up the infrastructure for electric vehicles

The policy will be in effect for three years from its date of commencement or year. The policy will be a kind of addition to the Fame India policy of phase II of Government of India.

The way in which the policy will be implemented –

2.11 There would be financial incentive, scrapping incentive, incentive provided on loans and waiving of road tax and registration fees.

2.12 Establishment of infrastructure like charging stations, battery swapping stations and with efforts to boost the transition a public database will be set up.

2.13 Various types of board and administration will be set up- State Electric Board, a public program will be created for spreading awareness among the general public for the use of Electric Vehicles and also making people aware of Delhi Government's policy.

2.14 Infrastructure for battery recycling will be created.

3. Literature Review

3.1 A study by the World Economic Forum.

It said that if India achieved the target of penetrating 30 % of EV vehicles, there would be a saving of around 474 million tons of oil equivalent. There would also be a saving of 842 million tons of Co2 emissions over lifetime. It acknowledged the efforts of Indian Government. The government has created good momentum through their efforts by providing schemes to increase the pace of manufacturing and shifting towards electric vehicles. WEF, referring to a report by ET, said that if proper infrastructure is in place, 90% of car owners are ready to shift towards electrical vehicles.

Studies suggest that states have a critical role in deployment and setting up infrastructure of EV's in India. It took into account that 10 states and UT's have drafted or published final policies. For e.g – in the case of Delhi, seeing high pollution and being the capital of the nation and one of high employment areas, the Delhi government has focused on parts of EV's that have the same life cycle cost as compared to the ICE. It also looks forward to providing jobs to battery swapping operators. In the end it stated that it is not multi-stakeholders need to come together to ramp up the production and bring down the prices. It said that transition of a country with a population near 1.3 billion is not an easy task, therefore a strong common vision and a strong conviction from both public and private is needed to lead a way of mass transition.⁴

3.2 Review on Delhi Government's latest EV policy- analysis by INC 42.

It has been referred to as a much needed move, as it refers to the pollution level in Delhi (making it one of the most polluted cities in the world). The aim of registering 5 lakh vehicles will not only have monetary benefits but would also have health benefits for the people of the state. The analysis by the community suggests that this aim will lead to reduction of INR 6000 petroleum imports and emissions would be reduced to the extent of 4.8 million tons of CO2. The analysis suggests that vehicular pollution is one of the major causes of pollution in the National Capital Region (NCR) which is the reason why Delhi government is focusing on two wheeler, shared transport vehicles and vehicles carrying freight and other things. The analysis by the community taking into account another study suggested that electrification of fleet of vehicles comprising 6%, and if close to 50% electrification of public transport is done would lead to decrease in ambient air pollution by 9%.

It stated that on one hand various states like Uttar Pradesh, which focuses on manufacturing of electrical vehicles. Delhi's policy has mainstream focus on demand generation as it could lead to a quick transition. Delhi government for demand generation has moved forward with a pair of incentive, which comprise of fiscal and non-fiscal incentive. Fiscal incentive will include purchase, e-auto registration of old vehicles and non-fiscal incentive may include single window clearance,

license free waivers and other things. Concluding by stating the words of Hon. Chief Minister of Delhi- Arvind Kejriwal "The policy aims to make Delhi, the EV capital of India". It stated that the policy will face huge number of challenges, as manufacturing capacity in India is still at its very early age, charging infrastructure is still not good enough and not to forget consumer awareness is still not at a nascent level.⁵

3.3 Analysis by The New India Express – " IS DELHI EV READY ?"

The writer while citing Delhi's Transport minister Mr. Kailash Gahlot words of transforming Delhi into EV capital said "I think it will take 10-15 years to make Delhi fully electric because we don't have infrastructure, such as charging stations. Government said to establish 20,000 charging spots in 2019, but they have not been implemented." Comment of Mohd Jawaad Khan, who is founder of a EV making company- Tadpole projects. He also cited higher prices of most electric vehicles, prices above Rs.20,00,000 which is too costly for an average Indian family.

The report cited that 70% of the cost of electrical vehicles are of lithium ion batteries and India is not a manufacturer of lithium ion batteries as it imports it from China which is one of the main manufacturers of lithium ion batteries. So, if India wants to bring EV price to that of petrol and diesel then it has to start its own manufacturing plant. Government's interest in this field will likely to decrease the price parity between ICE and e-vehicles in coming years as local battery technology will improve as organization like ISRO, IIT, DRDO are working on the same.

According to the report one of the interviewee believes that retrofitting of the vehicles will be more beneficial, as it would decrease scrapping burden and also bringing down the pollution at the same time reducing the cost. It also gave the information that a survey organized by Lithium Urban Technologies that around 70% population in Delhi are ready to electric vehicle if the price are reduced.⁶

3.4 An article by Economic Times: Future of EV in India

It acknowledged that mention of electrical vehicles which was earlier done by only few is now catching attention of large no. of population. It cited a study that by 2022, most Indians would prefer buying electrical vehicles, which will trigger growth of EV in India. It also acknowledged that the government's role is very crucial in large-scale transition.

According to the article the battery prices are expected to come down by 30% during the period of 2018-2025. Every report, while defining the key segment which has capability of large scale transition, mentions the two-wheeler segment, this article also acknowledged it. The stats also supported it- In 2019, total no. Of EV sold 1.56 lakh of which 1.52 lakh were two-wheelers, 3,400 were electric cars, 600 were electric buses. Decreasing cost of technology, increasing pollution level and government and public interest is going to accelerate India's EV growth.⁷

4. Data Collection

We conducted an online survey to know about people's view on Electric Vehicles

The research paper data source includes both primary and secondary data. But, secondary data contributed more to the research than the primary data.

4.1 Primary Data – To obtain primary data we conducted an online survey through google questionnaire and evaluated them using excel, it included 60 respondents, who gave their valuable knowledge.

4.2 Secondary Data – It is the main contributor to the research paper. The reason being, we got quality and practical knowledge in less time. The data we collected was from various articles, journals, research papers, blogs and many other well known sites.

4.3 Sampling - Convenience sampling has been used.

The result of our online survey we conducted to know about people's view on EV's.

Age of Respondent
53 responses

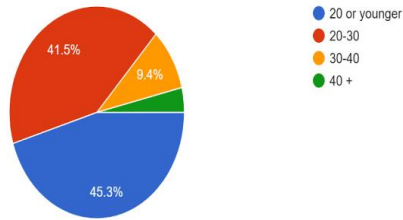


Chart -1: Age of Respondent

Occupation of the respondent
53 responses

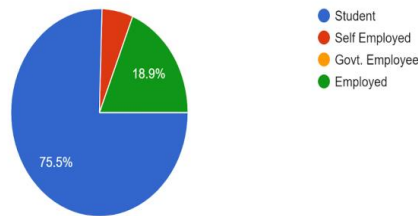


Chart -2: Occupation of Respondent

Are you environment cautious ?
53 responses

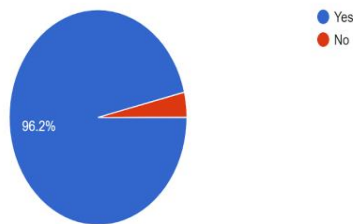


Chart -3: Probable respondents for EV market.

Do you own a car ?
53 responses

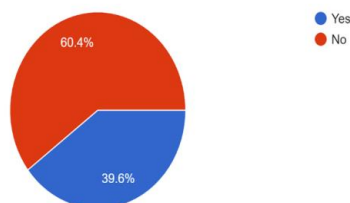


Chart -4: Respondents concern for environment.

Do you see electric vehicles as the future of automobile sector in India ?
53 responses

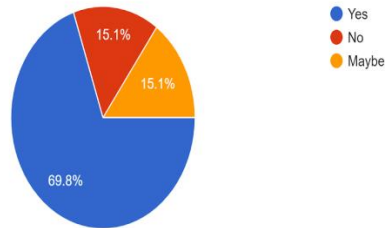


Chart -5: Respondents view about Ev's future.

What fuel type would you like to prefer for your car ?
53 responses

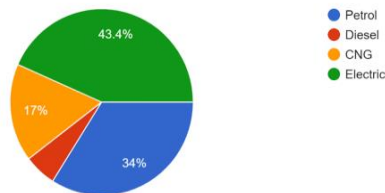


Chart -6: Respondents view regarding fuels.

What you feel about price of electrical vehicles ?
53 responses

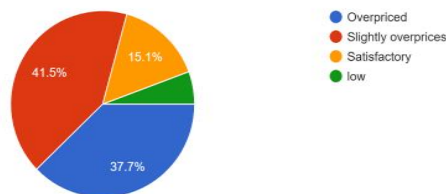


Chart -7: What view respondents have about EV.

Would you buy electrical vehicles if it is available at same price as of gasoline powered vehicle?
53 responses

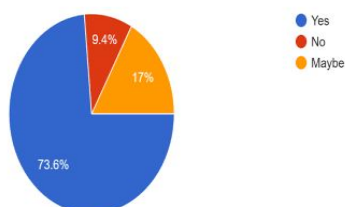


Chart -8: Preference for EV's

How much more are you willing to pay for owning a electric vehicle with similar features and functionality as a gasoline powered vehicle?
52 responses

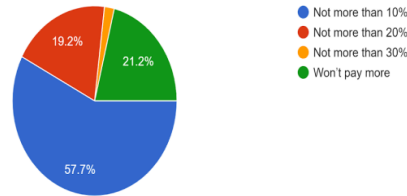


Chart -9: About how much a respondent is ready to pay for EV.

4. CONCLUSIONS

This research paper has taken into consideration every aspect of Electrical Vehicles in Delhi including Government Policies, Barriers for growth in this sector, Opportunities in this sector, National and international scenario etc.

From the data collected and represented above in the form of pie charts, number of important points can be derived by studying these pie charts that shows people’s vision for the current and future scenario of Electrical Vehicles in Delhi.

It can be seen that the majority of the people are environmentally cautious which is a positive sign being a citizen of any country. Even though people are environmentally cautious more than 30% of the people would like to prefer Petrol as a fuel for their cars. This shows people are not much aware about the electric cars or it’s impact in the market. Along with this majority of the people who are more that 80%, feel that Electric Vehicles are overpriced which makes it out of their budget. Being an overpriced product in a Indian Market, a product could see a downfall in its growth as the majority of the Indian population is middle class and since electrical vehicles are out of their budget, the sales could go down. To overcome this situation the government can help both manufacturers and buyers by providing subsidies, tax reliefs etc. As this could promote the use of electrical vehicles. Even though people are saying EVs are overpriced they are still ready to pay around 10% they would pay for a gasoline powered vehicle and this shows that people are willing to buy electrical vehicles but price is a major decider. It can also be seen from the data collected that the majority of the people would buy an electric vehicle if it is available at the same price as a gasoline powered vehicle which again shows the environmental cautious mentality of the people. It can be seen that people are looking forward to electrical vehicles in future as they see them advantageous over gasoline powered vehicles. While considering buying an electrical vehicle people look for performance and environmental effect but what discourages them from doing so is the price and lack of available charging points and technology as well.

REFERENCES

- [1] <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>
- [2] <https://www.virta.global/global-electric-vehicle-market#two>
- [3] [electric-vehicle-mobility-ev-adoption.pdf \(assets.kpmg\)](#)
- [4] <https://www.weforum.org/agenda/2019/10/how-can-india-transition-to-electric-vehicles-heres-a-roadmap/>
- [5] <https://inc42.com/resources/delhis-electric-vehicle-policy-will-it-be-a-game-changer/>
- [6] <https://www.newindianexpress.com/cities/delhi/2021/apr/01/isdelhi-ready-for-electric-vehicles-2284153.html>
- [7] <https://auto.economictimes.indiatimes.com/news/policy/delhi-electric-vehicle-policy-2020-key-things-to-know-and-analysis/77420070>